



A PRACTICAL GUIDE FOR **MEDICAL TEACHERS**

SIXTH EDITION



JOHN **DENT** | RONALD **HARDEN** | DAN **HUNT**

A Practical Guide for Medical Teachers

SIXTH EDITION

EDITED BY

John A Dent, MMEd MD FAMEE FHEA
FRCS(Ed)

*International Relations Officer, Association for Medical Education in Europe; Hon. Reader in
Postgraduate Medicine, University of Dundee, Dundee, UK*

Ronald M Harden, OBE MD FRCP(Glas)
FRCSEd FRCPC

*General Secretary, Association for Medical Education in Europe, Professor Emeritus, University
of Dundee, Dundee, UK*

Dan Hunt, MD MBA

*Field Secretary, Liaison Committee on Medical Education; President, Accreditation
International, Seattle, WA, USA*



Table of Contents

Title page

Any screen, Any time, Anywhere

Copyright

Foreword

Preface

List of Contributors

Section 1: Curriculum Development

1. The Medical School of the Future

Key concepts

Introduction

Medical education challenges

The trends recognized before the current Coronavirus pandemic

Changes proposed or required after the Coronavirus pandemic

Summary

References

2. Curriculum Planning and Development

Key concepts

Introduction

What is a curriculum?

Summary

References

3. The Undergraduate Curriculum

Key concepts

Introduction

Forces shaping the curriculum

Critical components of the undergraduate medical education programme as they relate to the continuum of medical education

Summary

References

4. Postgraduate Medical Education: A 'Pipeline' to Competence

Key concepts

Introduction

Key elements of postgraduate medical education programmes

Education components of postgraduate medical education programmes

A resident perspective on postgraduate medical education

Summary

References

5. Continuing Professional Development

Key concepts

Introduction

Continuing professional development: a professional and ethical obligation

Continuing professional development evolution

A proposed model for knowledge transfer in continuing professional development

The future of continuing professional development: technology and disruptive innovation

Continuing professional development: from good to great

Summary

References

6. The Hidden Curriculum

Key concepts

Introduction

Historical context

Definitions and metaphors

Applications: exploring/assessing the hidden curriculum

Student mistreatment: a case study in applying the HC lens

Summary

References

7. The International Dimension of Medical Education

Key concepts

Introduction

Internationalization of medical curricula

Educating the global physician

Internationalization of distant curricula

Setting standards

Educational trends and their challenges

The way forward

Summary

References

Section 2: Learning Situations

8. How Students Learn

Key concepts

Introduction

Assumptions around learning

Multiple definitions of learning

Learning theories and strategies

Learning styles

Learning approaches and contexts

Summary

References

9. Lectures

Key concepts

Lectures in medical teaching

Introduction

Pros and cons of lectures as a primary learning event

Learning in a lecture environment

Organizing a lecture

Teaching materials

Active learning in the lecture hall

Summary

References

10. Learning in Small Groups

Key concepts

Introduction

What is a small group?

When to use small groups

How to effectively conduct a small group learning session

Summary

References

11. Clinical Teaching

Key concepts

Introduction

The 'learning triad'

Educational strategies for clinical teaching

Strategies for inpatients

Strategies for outpatients

Educational strategies applicable to all clinical settings

Hospital ward opportunities—models for managing learning in the ward

Ambulatory care opportunities

Assessment of clinical learning

Staff development

Summary

References

12. Learning in Urban and Rural Communities

Key concepts

Introduction

Learning medicine in community settings

Block rotations, prolonged attachments and continuity experiences

The patient-doctor relationship

Social and cultural dimensions

Adaptive expertise and generalism

Clinical decision making in the community setting

Learning with and from others

Clinical learning in rural and urban community settings—similarities and differences

Learning medicine where graduates are expected to practice

The medical teacher's role

Practical examples

Research

Summary

References

13. Learning in Longitudinal Integrated Clerkships

Key concepts

Introduction

Defining Lics

History

Rationale

Learning imperatives

Professional imperatives

Health system imperatives

Societal imperatives

Model types

Generalist model longitudinal integrated clerkships

Multispecialty 'streams' model longitudinal integrated clerkships

Impact of longitudinal integrated clerkships

Developing and sustaining longitudinal integrated clerkships

Summary

References

14. Learning in a Simulated Environment

Key concepts

Introduction

Background

Simulation as design

Simulated patients

Simulated patient methodology and trends in medical education

Fundamental concepts in simulated patient methodology

Discourses of clinical competence

Scope of simulated participants practice

Hybrid simulations

Patients' voices

Qualities of simulated patients

Supporting simulated patients in role portrayal and feedback

Simulation technology

Physical models

Immersive simulators

Hybrid simulators

Current and future trends

Simulation in the 21st century

Summary

References

15. Independent Learning and Distance Education

Key concepts

Introduction

The terms that describe learner control of learning

Importance of being an independent learner

Characteristics of independent learners

The challenge of developing independent learners

Important approaches for facilitating development include

The digital world and distance learning by the independent learner

Digital literacies for independent learning and distance learning

Future trends in independent learning and distance learning

Summary

References

Section 3: Educational Strategies and Technologies

16. Outcome-Based Education

Key concepts

Introduction

The trend towards outcome-based education

Why the move to outcome-based education?

Implementation of outcome-based education

Implementing outcome-based education

Myths about outcome-based education

Summary

References

17. Integrated Learning

Key concepts

Introduction

What is meant by integration?

Rationale for integrated learning

Curricular/program integration

Horizontal versus vertical integration

Course level versus session level integration and the benefits of causal networks

Strategies to achieve integrated learning at the session level

Assessment in an integrated curriculum

Challenges to integration

Summary

References

18. Interprofessional Education

Key concepts

History and developments

Interprofessional education and collaborative practice

Evidence for the effectiveness of interprofessional education

Theories underpinning interprofessional education and interprofessional collaborative practice

Curriculum development

Learning outcomes and accreditation

Learning activities

Assessment

Faculty development for interprofessional education

Overcoming challenges

Summary

References

19. Problem-Based Learning

Key concepts

Introduction

Problem-based learning: philosophy, principles and techniques

A traditional perspective on problem-based learning

Different shapes of problem-based learning

Reflection on problem-based learning as a family of related approaches

Summary

References

20. Team-Based Learning

Key concepts

What is team-based learning?

What makes team-based learning work?

Instructor wrap-up

Summary

References

Online resources

21. Digital Technologies in Medical Education

Key concepts

Introduction

Technology as medium

Technology as context

Technology as outcome

Technology as intelligence

Summary

References

Further reading

Section 4: Curriculum Themes

22. Relevance of Foundational Sciences to the Curriculum

Key concepts

Introduction

The changing medical curriculum

The active learning environment

Use of reflective practice, critical thinking and clinical reasoning

Innovations in teaching foundational sciences

Foundational science integration throughout the curriculum

Nontraditional discipline-independent foundational science skills

Learning foundational science outside curricular structure

Summary

References

23. Social and Behavioural Sciences in Medical School Curricula

Key concepts

Introduction

Why are the Social and Behavioural Sciences important in medicine?

What topics should be included in the curriculum?

Where and when should Social and Behavioural Sciences be presented in the curriculum?

Who should do Social and Behavioural Sciences teaching design and delivery?

How can Social and Behavioural Sciences be learnt, taught, and assessed?

Assessment

How do we implement a Social and Behavioural Sciences curriculum?

Summary

References

Further Reading

24. Clinical Communication Skills

Key concepts

Introduction

Using role play (simulation)

The wider context

Professionalism

Summary

References

Appendix 1

25. Ethics, Empathy and Attitudes

Key concepts

Introduction

Critical challenges

Undergraduate education

Assessment of ethical and professional attitudes

The special nature of attitudes

Summary: effecting culture shift

References

26. Professionalism

Key concepts

Introduction

Defining professionalism

Setting expectation: agreeing a framework for professionalism

Developing a culture of professionalism: role modelling and the hidden curriculum

Digital professionalism

Educating faculty on social media

Assessing professionalism

Summary

References

27. Medical Research (in General) and Evidence-Based Medicine

Key concepts

Introduction

What is evidence-based medicine?

Evolution of evidence-based medicine

Implications for medical teachers

Summary

References

28. Patient Safety and Quality of Care

Key concepts

Introduction

Introduction to patient safety

Introduction to healthcare quality

Teaching healthcare quality and patient safety

Summary

References

29. Medical Humanities

Definitions

Introduction

What are the medical humanities?

How do the medical humanities contribute to medical education?

Curriculum structure: Hong Kong University medical humanities programme case example

What are some practical considerations and challenges?

Summary

Acknowledgement

References

30. Integrative Medicine in the Training of Physicians

Key concepts

Introduction

Integrative medicine in undergraduate medical education

Clerkships

Integrative medicine in graduate medical education

Summary

References

31. Clinical Reasoning

Key concepts

Introduction

Theories underlying the teaching of clinical reasoning

Lesson 1. Teaching clinical reasoning must emphasize the development of detailed, content-specific, organized knowledge

Lesson 2. Clinical reasoning requires multiple strategies and flexibility in strategy use

Lesson 3. Clinical reasoning expert performance requires prolonged and deliberate practice

Lesson 4. Motivation and emotion impact on clinical reasoning

Lesson 5. Clinical reasoning is context-specific

Summary

References

32. Medical Education in an Era of Ubiquitous Information

Key concepts

Introduction

Data, information, and knowledge

Healthcare in the digital age (and biomedical knowledge in the cloud)

The digital native learner

Three key competencies at a time of ubiquitous information and educational strategies to support the digital learner

Metacognition and sensing gaps in one's knowledge

Information retrieval and the ability to form an appropriate question

Evaluating and weighing evidence to make decisions; recognizing patients and interprofessional colleagues as additional sources of information

Summary

References

Section 5: Assessment

33. Concepts in Assessment Including Standard Setting

Key concepts

Introduction

Measurement theories

Types of assessment

Qualities of good assessment

Validity theory

Score interpretation

Score equivalence

Standards

Self-assessment

Objective versus subjective assessments

Summary

References

34. Written Assessments

Key concepts

Introduction

Response formats

Stimulus formats

Summary

References

35. Performance and Workplace Assessment

Key concepts

Introduction

Assessments of clinical competence

Assessing performance in the workplace

Outstanding issues in performance assessment

Summary

References

36. Portfolios, Projects and Theses

Key concepts

Introduction

The objectives and contents of portfolios

Success factors for portfolios

Portfolio assessment

Thesis and project circle

Summary

References

37. Feedback, Reflection and Coaching: Tools for Continuous Learning

Key concepts

Introduction

Feedback

Reflection

Coaching

Summary

References

38. The Assessment of Attitudes and Professionalism

Key concepts

Why assess professionalism? Setting the boundaries

What do we mean by professionalism? Agreeing the definition

When should professionalism be assessed?

How should professionalism be assessed?

The tools

Cognition: Knows

Tools across the continuum—a portfolio of professionalism

Summary

References

39. Programmatic Assessment

Key concepts

Introduction

The traditional approach

Programmatic assessment

An example

Conclusion

Summary

References

Section 6: Staff

40. The Roles of the Medical Teacher

Key concepts

The changing roles of the medical teacher

The teacher as an information provider and coach

The teacher as a facilitator and mentor

The teacher as a curriculum developer and implementer

The teacher as an assessor and diagnostician

The teacher as a role model as teacher and practitioner

The teacher as a manager and leader

The teacher as a scholar and researcher

The teacher as a professional

Summary

References

41. The Teacher as a Scholar

Key concepts

Introduction

Broadening the definition of teacher scholar/criteria for teacher scholar

Summary

References

Online resources

42. Staff Development

Key concepts

Introduction

Common practices and challenges

Designing a staff development programme

Determine appropriate goals and priorities

Summary

References

43. Mentoring

Key concepts

Introduction

Definitions

Benefits of mentoring

Approach to mentoring: balancing support–challenge–vision

Roles and tasks of a mentor

Types of mentoring relationships

Stages of a mentoring relationship

Challenges in mentoring

Designing effective mentoring programmes

Evaluating mentoring and mentoring programmes

Summary

References

Further reading

44. Burnout, Mistreatment and Stress

Key concepts

Introduction

Stress

Burnout

Preventing and recovering from stress and burnout

Compassion

Does compassion lead to weakness or unfairness?

Self-compassion

Mistreatment and addressing the wider systems

Teaching compassion with compassion

An exercise in attentiveness (designed by Anne-Birgitta Pessi, University of Helsinki)

Growing discernment

Action

Helping students to stay well

'Questions in a hat', 'Blether' at Black Medicine, and "Am I the only one?"

Medical humanities

Role modelling

Summary

References

45. The Patient as Educator

Key concepts

Introduction

Patient and public involvement

Patient and public involvement in medical programme accreditation

Training and preparation of patient-educators

Spectrum of involvement of patient-educators

Educational value of involving patients as educators

Potential for expanded role of patients as educators

Case study: the Doubleday Centre for Patient Experience

Challenges facing patient-educator programmes

Future research opportunities

Summary

References

Section 7: Students & Trainees

46. Selection of Students and Trainees

Key concepts

Introduction

Errors of ignorance

Errors of purpose

Errors of conception

Errors of implementation

Errors of judgment

Summary

References

47. Students and Trainees in Need of Additional Support

Key concepts

Introduction

Identifying learners in need of support

Additional support as an identity challenge

System issues

Summary

References

48. Student Engagement in the Educational Programme

Key concepts

Introduction

Benefits of student engagement

Theoretical framework of student engagement

Student engagement in the curriculum

A stepwise approach for enhancing student engagement

How to avoid major pitfalls?

Criteria for student engagement excellence: the ASPIRE programme

Summary

References

49. Professional Identity and Career Choice

Key concepts

Introduction

Professional identity

Values

Selection

Careers choice and guidance

Summary

References

Section 8: Medical School

50. Curriculum and Teacher Evaluation

Key concepts

Introduction

Specific to faculty evaluations

Summary

References

51. Medical Education Leadership

Key concepts

Introduction

The 'leadership triad'

Leadership theory and practice

Personal qualities and attributes

Leadership is context dependent

Leading groups and teams

A systems' perspective

Accountability, advocacy and activism

Summary

Acknowledgements

References

52. The Medical Teacher and Social Accountability

Key concepts

Introduction

Social accountability of medical schools

Medical teachers and social accountability

Medical teachers comprehensive roles in socially accountable medical schools

Practical examples of medical teacher social accountability

Research

Summary

References

53. The Educational Environment

Key concepts

Introduction

The preclinical learning environment

The clinical learning environment

The physical and architectural environment

Technology-enhanced, virtual and hybrid environments

Diversity in the learning environment

Creating a safe and supportive learning environment

Evaluating and improving the learning environment

The learning environment of the future

Summary

References

54. Medical Education Research

Key concepts

Introduction

Quantitative and qualitative research

The use of theory

Mixed methods research

Reflection

Building capacity

Funding

Summary

References

55. Diversity, Equality and Individuality

Key concepts

Introduction

Theoretical background

The projects


Reflection: the two projects in comparison (Table 55.1)

Summary

References


Index

Any screen, Any time, Anywhere



Any screen.
Any time.
Anywhere.

Activate the eBook version
of this title at no additional charge.



Elsevier eBooks for Practicing Clinicians gives you the power to browse and search content, view enhanced images, highlight and take notes—both online and offline.

Unlock your eBook today.

1. Visit expertconsult.inkling.com/redeem
2. Scratch box below to reveal your code
3. Type code into “Enter Code” box
4. Click “Redeem”
5. Log in or Sign up
6. Go to “My Library”

It's that easy!

For technical assistance:
email expertconsult.help@elsevier.com
call 1-800-401-9962 (inside the US)
call +1-314-447-8300 (outside the US)

Use of the current edition of the electronic version of this book (eBook) is subject to the terms of the nontransferable, limited license granted on expertconsult.inkling.com. Access to the eBook is limited to the first individual who redeems the PIN, located on the inside cover of this book, at expertconsult.inkling.com and may not be transferred to another party by resale, lending, or other means.

Place Peel Off
Sticker Here

2020_PC

Copyright

© 2021, Elsevier Limited. All rights reserved.

First edition 2001

Second edition 2005

Third edition 2009

Fourth edition 2013

Fifth edition 2017

Sixth edition 2021

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website:

www.elsevier.com/permissions

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

Notices

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds or experiments described herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made. To the fullest extent of the law, no responsibility is assumed by Elsevier, authors, editors or contributors for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

ISBN: 978-0-7020-8170-5

Printed in Poland

Last digit is the print number: 9 8 7 6 5 4 3 2 1

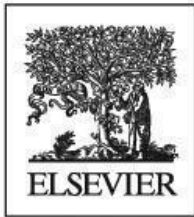
Content Strategist: Elyse O'Grady

Content Development Specialist: Veronika Watkins

Project Manager: Anne Collett

Design: Bridget Hoette

Illustration Manager: Narayanan Ramakrishnan



Working together
to grow libraries in
developing countries

www.elsevier.com • www.bookaid.org

Foreword

It is once again my honour to provide the foreword to this excellent book, now a classic reference in medical education that I have watched evolve through 6 editions over two decades. The 6th edition brings 17 new or reworked chapters and introduces 20 new authors from around the world, adding interest and context for an ever-growing international audience.

The 6th edition comes to press as the world is grappling with a devastating pandemic: COVID-19 has shone a light on the competencies and contributions of health professionals in society as never before. Thus, it is fitting that the new edition continues to shift the focus to *who* we are as educators, as much as what we *do*. Greater attention is warranted in our field on professional identity formation, the roles of teachers, and the growing imperative to counter stress and burnout. Further, the need for multiple perspectives has never been clearer and this edition adds a welcome chapter on equity, diversity and inclusion. It also recognizes the growing role of patients in their own care, exploring the incredible opportunity of patients as teachers.

The medical education literature is enormous and can be overwhelming. This *Guide* therefore serves as a helpful starting place, either as a reference to consult for focal questions or as a more leisurely read in its entirety, to provide an orientation to the vast field.

The Guide is organized in 8 sections, each designed around a pragmatic theme. The first section sketches out the trajectory of medical education curriculum, taking the stance that learning is a lifelong commitment from the first day of medical school to the last day of practice. That journey is fraught with challenge, and this section takes up the hidden curriculum and adds a new chapter on international perspective.

The combination of advancing technology and the global restrictions on in-person encounters resulting from the pandemic have propelled digital and online learning as never before. The second and third sections of the book address the many contexts in which medical education takes place, with a refreshed chapter on independent and distance learning.

The fourth section contains an exciting new chapter on clinical reasoning, a topic of importance as artificial intelligence begins to shape a debate about the role of the human versus the computer mind in healthcare. Aligned with this are enhancements to chapters on the foundational sciences, communication skills and the role of evidence in general. Recent years have seen an egregious normalization of disinformation in media and political discourse and for schools of higher education it has become urgent to identify and critically scrutinize sources of 'truth'.

The fifth section provides a helpful compendium of approaches to the assessment of

students, serving to reduce what can be a cacophony of tools and strategies. As the competence-based movement gains steam, educators must choose assessment approaches that are in line with shifting objectives, questioning or abandoning approaches that are more often based on history and tradition than learning science.

Section six is entirely rewritten, reflecting a shift in our field from what we teach to who we are. Grappling with the interdigitating roles of teacher, learner and patient, it is here that the hot topics of mentoring, burnout, mistreatment and identity are addressed. Section 7 continues this focus with chapters on the practical application of these challenges for learner support, engagement and career choice.

Finally, section 8 shines a light on medical schools themselves, continuing an expansion of the frame of medical education that allows educators to grapple more fully with the importance of institutions. The social responsibility of medical schools is no longer in question and their accountability for learning environments and leadership are addressed here. Equity, diversity and inclusion cannot be slogans and the need for deliberate measurement towards goals by evaluating teachers, curricula and institutions is critical.

The sixth edition of *A Practical Guide for Medical Teachers* brings new ideas to our field, while continuing to do what it has done well for decades; it is a trusted companion, a source of wisdom, and a GPS of sorts for our field in a chaotic and disrupted world. Each edition welcomes those who are new to our field, whilst serving as a bridge across the global community of medical and health professions educators. Whether you hold a print copy in your hands or are accessing the electronic version, this is a gateway to a strong, vibrant community of medical and health professions educators. And in these challenging times, we are stronger together.

Brian D. Hodges, MD PhD FRCPC

Toronto, 2021

Preface

“To help colleagues in the healthcare professions to teach and to help students to learn” is a neat summary of our responsibilities in medical education. This sixth edition of *A Practical Guide for Medical Teachers* continues to pursue this aim. As successive editions of the book come around, the need is apparent for new topics to be included that reflect the ongoing developments in education of health professionals. This edition is no exception. We have identified 10 new or developing facets of teaching or learning to highlight in new chapters. Issues relating to teaching staff and to the medical school’s function have been a particular focus for attention. Staff wellbeing and the changing roles of a medical teacher have been addressed. Important for medical schools are issues relating to inclusivity and diversity, and to evaluation of the curriculum. There is an engaging chapter on the patient as an educator and a new chapter looking at the international dimension of medical education.

This sixth edition was largely compiled amidst the COVID-19 pandemic, and it provides a timely guide to the challenges we face in our journey to the medical school of the future. How we adapt to these changes and challenges will probably define our future careers in medical education. Many authors have produced their contribution in the middle of extreme healthcare issues and stress. All contributors to the sixth edition deserve our special thanks for undertaking their task with enthusiasm, co-operation and good-natured patience. This time we have 17 new lead authors as well as more than 20 other new contributors from around the world. A strength of the book has been its global view of health professions education. The book’s international presence is facilitated by the availability of an electronic version.

We hope that colleagues from many countries, from all healthcare professions and from any stage in professional development will find valuable information in the guide and be encouraged as they pursue their activities of teaching or learning.

Special thanks again go to Prof Brian Hodges from the Wilson Centre for Research in Education at the University of Toronto. From his work in psychiatry and international education Prof Hodges has contributed a *Foreword* for this new edition from his perspective of teaching and learning for a healthier world.

Finally, having worked with the staff of Elsevier for more than 20 years, we remain grateful to them again for all their support, patience and steady guidance during the preparation of this new edition.

JA Dent, RM Harden and D Hunt

Dundee & Seattle, 2020

List of Contributors

The editors would like to acknowledge and offer grateful thanks for the input of all previous editions' contributors, without whom this new edition would not have been possible.

Samar Aboulsoud, MD PhD MSc MedEd FHEA MAcadMED, Associate Professor, Internal Medicine, Cairo University, School of Medicine, Cairo, Egypt

Shelley Adler, PhD, Professor, Department of Family and Community Medicine, Director, Osher Center for Integrative Medicine, University of California, San Francisco, San Francisco, CA, USA

Kambiz Afshar, MD PhD, Resident Physician, Lecturer, Research Fellow, Institute for General Practice, Hanover Medical School, Hanover, Germany

Francissca Appiah, BSc, Medical student, Amsterdam UMC-VU University School of Medical Sciences, Amsterdam, Netherlands

Marti Balaam, PhD MSc PgC ProfEd BA (Hons) RGN RNT FHEA FRSA, Professionalism and Wellbeing lead, Edinburgh Medical School, The University of Edinburgh, Edinburgh, UK

Amanda Barnard, BA(Hons) BMed (Hons) FRACGP SFHEA, Professor, Medical School, Australian National University, Canberra, ACT, Australia

Shoaleh Bigdeli, PhD MA BA BSc, Associate Professor, Medical Education, Center for Educational Research in Medical Sciences (CERMS), Department of Medical Education, School of Medicine, Iran University of Medical Sciences (IUMS), Tehran, Iran

Fernando Bello, PhD, Director, Centre for Engagement and Simulation Science, Surgery & Cancer, Imperial College London, London, UK

Charles Boelen, MD DPH MSc, International Consultant in Health System and Personnel, Former Coordinator of the WHO Program (Geneva) of Human Resources for Health, Sciez-sur-Léman, France

Katharine Boursicot, BSc MBBS MRCOG MAHPE NTF SFHEA, Associate Dean for Assessment, Office of Education, Duke-NUS Medical School, Singapore

Susannah Brockbank, MBChB PhD MRCP PGCert FHEA, Theme Lead - Professionalism, Ethics and Legal Context, University of Liverpool School of Medicine, Liverpool, UK

Julie Chen, BSc MD FCFPC, Family Medicine and Primary Care, The University of Hong Kong, Hong Kong

Jacqueline Chin, BPhil DPhil (Oxon), Independent Scholar, Singapore

Benjamin Chin-Yee, MD MA, Clinical Fellow, Division of Hematology, Western University, Canada

Jennifer Cleland, PhD DCLinPsychol FRCP(Edin) FAMEE, Professor of Medical Education Research and Vice-Dean (Education), Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore

John Dent, MMed MD FAMEE FHEA FRCS(Ed), International Relations Officer, Association for Medical Education in Europe, & Hon. Reader in Postgraduate Medicine, University of Dundee, Dundee, UK

Jim Determeijer, BSc, Medical Student, Faculty of Medicine, Amsterdam University Medical Center, University of Amsterdam, Amsterdam, Netherlands

Diana Dolmans, PhD, Professor, Educational Development & Research, School of Health Professions Education, FHML, Maastricht University, Maastricht, Netherlands

Erik Driessen, PhD, Professor, Department of Educational Development & Research, Maastricht University, Maastricht, Netherlands

Steven Durning, MD PhD FACP, Professor of Medicine and Pathology Medicine, Uniformed Services University, Bethesda, MD, USA

Rachel Ellaway, BSc PhD, Professor, Department of Community Health Sciences, The Cumming School of Medicine, The University of Calgary, Calgary, Alberta, Canada

Roger Ellis, DSc PhD MSc BA TCert ABPS FHEA, Emeritus Professor, Psychology, Ulster University, Belfast, Antrim, UK

Kevin Eva, PhD, Professor, Medicine, University of British Columbia, Vancouver, BC, Canada

Gerard Flaherty, MD MMed FRCPI FAcadMed, Professor of Medical Education, School of Medicine, National University of Ireland, Galway, Galway, Ireland

Kirsty Forrest, MB ChB BSc (Hons) FRCA FANZCA, Dean of Medicine, HSM, Bond University, Gold Coast, QLD, Australia

Janneke Frambach, PhD, Assistant Professor, School of Health Professions Education, Maastricht University, Maastricht, Netherlands

Jason Frank, MD MA(Ed) FRCPC FAOA (Hon), Director, Specialty Education, Strategy and Standards, Office of Specialty Education, Royal College of Physicians and Surgeons of Canada, Ottawa, ON, Canada

Chuck Friedman, PhD, Chair, Learning Health Sciences, University of Michigan Medical School, Ann Arbor, MI, USA

Elizabeth Gaufberg, MD MPH, Associate Professor of Medicine and Psychiatry, Harvard Medical School/Cambridge Health Alliance, Cambridge, MA, USA

Trevor Gibbs, MD DA FRCGP SFHEA FAcadMed MMedSci FAMEE, Professor, President, Association of Medical Education in Europe, Dundee, UK

Larry Gruppen, PhD, Professor, Learning Health Sciences, University of Michigan, Ann Arbor, MI, USA

Fred Hafferty, PhD, Professor of Medical Education, PPV, Mayo Clinic, Rochester, MN, USA

Heeyoung Han, PhD MA, Associate Professor, Department of Medical Education, Southern Illinois University School of Medicine, Springfield, IL, USA

Aviad Haramati, PhD, Professor of Integrative Physiology and Medicine; Director, Center for Innovation and Leadership in Education, Georgetown University Medical Center, Washington, DC, USA

Ronald Harden, OBE MD FRCP(Glas) FRCS(Ed) FRCPC, General Secretary, Association for Medical Education in Europe, Professor Emeritus, University of Dundee, Dundee, UK

Jeni Harden, MA MPhil PhD PFHEA, Usher Institute of Population Health Sciences and Informatics, University of Edinburgh, Edinburgh, UK

Revd Dr Harriet Harris, MBE MA (Oxon) DPhil DMin FRSA, University Chaplain and Head of Chaplaincy Service, Honorary Fellow of the Divinity School, University of Edinburgh; Co-Director, Global Compassion Initiative; Associate Fellow, Clinical Educator Programme; Chaplaincy Centre, Edinburgh, UK

Linda Headrick, MD MS, Professor Emerita of Medicine, School of Medicine, University of Missouri, Columbia, MO, USA

Sylvia Heeneman, PhD, Pathology, Maastricht University, Maastricht, Netherlands

Carol P. Herbert, CM MD DSc(Hon) CCFP FCFP FCAHS FRACGP(Hon), Professor

Emerita and former Dean, Schulich School of Medicine & Dentistry, Western University, London, ON; Adjunct Professor, School of Population and Public Health, University of British Columbia, Western Ontario, Canada

David Hirsh, MD FACP, Director, Harvard Medical School Academy Fellowship in Medical Education, Medicine, Harvard Medical School/Cambridge Health Alliance, Cambridge, MA, USA

Elaine Hogard, PhD, Director of Assessment and Program Evaluation, Undergraduate Medical Education, Northern Ontario School of Medicine, Thunder Bay, ON, Canada

Eric Holmboe, MD MACP FRCP FRCPC(Hon), Chief, Milestones, Accreditation Council for Graduate Medical Education, Chicago, IL, USA

Yingzi Huang, MBBS MPhil AFAMEE, Director, Association for Medical Education in Europe International Networking Centre, China, Guangzhou, China

Kathryn Huggett, PhD, Assistant Dean and Director, The Teaching Academy, University of Vermont Larner College of Medicine, Burlington, VT, USA

Woei Hung, PhD, Professor, Department of Education, Health & Behavior Studies, University of North Dakota, Grand Forks, ND, USA

Dan Hunt, MD MBA, Field Secretary, Liaison Committee on Medical Education; President, Accreditation International, Seattle, WA, USA

Abbas Hyderi, MD MPH, Founding Senior Associate Dean for Medical Education, Kaiser Permanente Bernard J. Tyson School of Medicine, Pasadena, CA, USA

William Jeffries, PhD FAHA, Vice Dean for Medical Education and Vice President for Academic Affairs, Geisinger Commonwealth School of Medicine, Scranton, PA, USA

Konstantin Jendretzky, Medical student, Hanover Medical School, Hanover, Germany

Ben Kligler, MD MPH, Professor of Family Medicine and Community Health, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Roger Kneebone, PhD FRCS FRCS(Ed) FRCGP, Professor of Surgical Education and Engagement Science, Surgery & Cancer, Imperial College London, London, UK

Sharon Krackov, MS EdD, Professor, Medical Education, Albany Medical College, Albany, NY, USA

Nirusha Lachman, PhD, Professor of Anatomy and Chair, Department of Clinical Anatomy, Mayo Clinic College of Medicine and Science, Rochester, MN, USA

Joel Lanphear, PhD, Professor Interim Senior Associate Dean/Academic Affairs, Central Michigan University, College of Medicine, Mount Pleasant, MI, USA

Pat Lilley, BA, Operations Director, Association for Medical Education in Europe, Dundee, UK

Machelle Linsenmeyer, EdD, Associate Dean, Office of Assessment and Educational Development, West Virginia School of Osteopathic Medicine, Lewisburg, WV, USA

Yousef Marwan, BMedSc BM BCh, Orthopaedic Surgery Fellow, Department of Surgery, McGill University, Montreal, Quebec, Canada

Marie Matte, PhD, Associate Dean, Compliance, Assessment, and Evaluation, Office of Medical Education, Central Michigan University College of Medicine, Mount Pleasant, MI, USA

Judy McKimm, MBA MA(Ed) BA (Hons) SFHEA, Professor of Medical Education School of Medicine Swansea University, Swansea, West Glamorgan, UK

Danette McKinley, BA MA PhD, Assistant Vice President, FAIMER, Philadelphia, PA, USA

Marie Mikuteit, Medical Student, Hanover Medical School, Hanover, Germany

Fakhrosadat Mirhoseini, PhD MSc NA BSc, Assistant Professor, Medical Education, Trauma Research Center & Educational Development Center, School of Allied Medical Sciences, Anesthesia Department, Kashan University of Medical Sciences, Kashan, Iran

Maaïke Muntinga, MA, PhD, Department Ethics, Law & Humanities, Amsterdam UMC-VU University, Amsterdam, The Netherlands

Debra Nestel, PhD FAcadMED FSSH CHSE-A

Professor of Surgical Education, Department of Surgery, Melbourne Medical School, Faculty of Medicine, Dentistry & Health Sciences, University of Melbourne, Melbourne, VIC, Australia

Professor of Simulation Education in Healthcare, Monash Institute for Health and Clinical Education, Faculty of Medicine, Nursing & Health Sciences, Monash University, Clayton, VIC, Australia

Andre-Jacques Neusy, MD DTM&H, Senior Director, Training for Health Equity Network, New York City, NY, USA

John Norcini, PhD, President Emeritus, FAIMER, Havertown, PA, USA

Jonas Nordquist, PhD, Director, Medical Case Centre, Department of Medicine, Huddinge Karolinska Institutet, Stockholm, Sweden

Stephanie Okafor, MSc, Junior Lecturer, Department Athena Institute, VU University, Amsterdam, Netherlands

Helen O'Sullivan, BSc MBA PhD PFHEA, Pro-Vice-Chancellor's (Education), Keele University, Keele, Staffordshire, UK

Neil Osherooff, PhD, Professor, John G. Coniglio Chair in Biochemistry, Departments of Biochemistry and Medicine, Vanderbilt University School of Medicine, Nashville, TN, USA

Irina Overman, MD, Assistant Professor, Internal Medicine, Geriatrics, and Medical Education, Wright State University Boonshoft School of Medicine, Dayton, OH, USA

Björg Pálsdóttir, MPA, Chief Executive Officer, Training for Health Equity Network, New York, NY, USA

Frank Papa, DO PhD, Professor, Medical Education, University of North Texas Health Science Center, Fort Worth, TX, USA

Dean Parmelee, MD, Director of Educational Scholarship, Medical Education, Wright State University Boonshoft School of Medicine, Dayton, OH, USA

Johmarx Patton, MD MHI, Director, Educational Technology and Standards, Medical Education, Association of American Medical Colleges, Washington, DC, USA

Douglas Paull, MD MS FACS FCCP CHSE CPPS, Adjunct Clinical Assistant Professor of Medicine, Department of Medicine, Georgetown University School of Medicine, Washington, DC, USA

Wojciech Pawlina, MD, Professor, Department of Anatomy, Mayo Clinic College of Medicine, Rochester, MN, USA

Antoinette S Peters, PhD, Corresponding member of the faculty, Department of Population Medicine, Harvard Medical School, Boston, MA, USA

Ingrid Philibert, PhD MA MBA

Senior Director, Accreditation, Measurement and Educational Scholarship, Frank H. Netter MD School of Medicine, Quinnipiac University, North Haven, CT
Director of Tracking and Evaluation, Great Plains IDeA CTR, University of Nebraska Medical Center, Omaha, NE, USA

Rille Pihlak, MD, University of Manchester, School of Medical Sciences, Division of Cancer Sciences, Manchester, UK

Ralph Pinnock, MB ChB BSc (Med) DCH MHealthSc MClinEd FRACP.S, Associate Professor and Head, Education Unit, Dunedin School of Medicine, Dunedin, New Zealand

Henry Pohl, MD, Executive Associate Dean, Albany Medical College, Albany, NY, USA

Mark Quirk, EdD, Senior Consultant, Medical Education, American University of the Caribbean, Sint Maarten, ANT

Subha Ramani, MBBS PhD MPH MMed, Associate Professor of Medicine, Harvard Medical School, Boston, MA, USA

James Rourke, MD CCFP(EM) MClSci FCFP FRRMS FCAHS LLD, Professor Emeritus & Former Dean of Medicine, Memorial University of Newfoundland, St John's, NL, Canada

John Sandars, MB ChB MSc MD MRCP MRCGP FAcadMed CertEd, Professor of Medical Education, Edge Hill University Medical School, Edge Hill University, Ormskirk, UK

Yamini Saravanan, MD MHS, Physician, Internal Medicine, Cambridge Health Alliance, Cambridge, MA, USA

Joan Sargeant, PhD, Professor, Medical Education, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada

Lambert Schuwirth, MD PhD, Professor of Medical Education, Prideaux Centre for Research in Health Professions Education, Flinders University, Adelaide, SA, Australia

Robina Shah, MBE DL JP BSC (HONS) PhD PGCHE SFHEA CPsychol FRCGP (Hons), Manchester Medical School, University of Manchester, Manchester, UK

Tara Singh, MD, Obstetrics & Gynecology, Cambridge Health Alliance, Cambridge, MA, USA

John Skelton, BA MA RSA MRCGP, Professor, College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK

C. Leslie Smith, MS MA LAc MD DABMA Dipl NCCAOM, Assistant Professor, Dept of Medical Education and Family Medicine; Director, Integrative Medicine; Director, Culinary Medicine, Southern Illinois University School of Medicine, Springfield, IL, USA

Linda Snell, MD MHPE FRCPC MACP, Professor of Health Sciences, Education and Medicine, Institute for Health Sciences Education, McGill University, Montreal, Quebec, Canada

Sandra Steffens, MD, Professor, Department of Curriculum Development, Hanover Medical School, Hanover, Germany

Yvonne Steinert, PhD, Professor of Family Medicine and Health Sciences Education, Institute of Health Sciences Education, Faculty of Medicine and Health Sciences, McGill University, Montreal, Quebec, Canada

Roger Strasser, AM MBBS BMedSc MCISc FRACGP FACRRM FCAHS FRCGP (Hon) LLD(Hon) MD(Hon) FRCPSC(Hon), Professor of Rural Health, Founding Dean Emeritus, Northern Ontario School of Medicine, Sudbury, ON, Canada

Boyung Suh, PhD, Assistant Professor, Dept of Medical Education, Southern Illinois School of Medicine, Springfield, IL, USA

John Szarek, BPharm PhD CHSE, Professor and Director Clinical Pharmacology, Medical Education, Geisinger Commonwealth School of Medicine, Scranton, PA, USA

Omar Tanay, BSc, Medical student, Faculty of Medicine, Amsterdam University Medical Center, VU Amsterdam, Amsterdam, Netherlands

David Taylor, MEd MA PhD EdD FRSB PFHEA FAcadMed FAMEE, Professor of Medical Education and Physiology, College of Medicine, Gulf Medical University, Ajman, United Arab Emirates

Ray Teets, MD, Assistant Professor of Family Medicine and Community Health, Director, Institute for Family Health Integrative Family Medicine Fellowship, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Jill Thistlethwaite, BSc MBBS PhD MMed, Adjunct Professor, Faculty of Health, University of Technology, Sydney, NSW, Australia

Alik Thomas, BSc OT MEd PhD, Associate Professor, School of Physical and Occupational Therapy, Institute of Health Sciences Education, Faculty of Medicine and Health Sciences, McGill University Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal, Montreal, Quebec, Canada

Dario Torre, MD PhD MPH, Professor of Medicine, Uniformed Health Services, University of Health Sciences, Bethesda, MD, USA

Cees van der Vleuten, MA PhD, Professor of Education, Department of Educational, Development and Research, Maastricht University, Maastricht, Netherlands

William Ventres, MD MA, Associate Professor, Family and Preventive Medicine, University of Arkansas for Medical Sciences, Little Rock, AR, USA

Petra Verdonk, MA PhD, Department of Ethics, Law & Humanities, Amsterdam UMC-VU University, Amsterdam, Netherlands

Peter Vlasses, BSc PharmD, Executive Director Emeritus, Retired, Accreditation Council for Pharmacy Education, Chicago, IL, USA

Teck Chuan Voo, MA PhD, Centre for Biomedical Ethics, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Kieran Walsh, MB BCh BAO, Clinical Director, BMJ, BMJ Group, London, UK

Lucie Walters, MBBS FACRRM PhD, Professor, Adelaide Rural Clinical School, University of Adelaide, Mount Gambier, SA, Australia

Val Wass, OBE FRCGP FRCP MHPE PhD, Professor of Medical Education in Primary Care, The School of Medicine, Aberdeen University; Chair WONCA Working Party on Education; Emeritus Professor of Medical Education, Faculty of Health, Keele University; Staffordshire, UK

Kevin Weiss, MD, Chief Officer, Sponsoring Institutions and Clinical Learning, Environments Accreditation Council for Graduate Medical Education, Chicago, IL, USA

Connie Wiskin, BA MPhil PhD, Reader, College of Medical and Dental Sciences, University of Birmingham, UK

Harry Wu, MD DPhil, Assistant Professor, Medical Ethics and Humanities Unit, The University of Hong Kong, Hong Kong

Marko Zdravkovic, MD PhD candidate, Department of Anaesthesiology, Intensive Care and Pain Management, University Medical Centre Maribor, Maribor, Slovenia

SECTION 1

Curriculum Development

OUTLINE

- 1 The Medical School of the Future
- 2 Curriculum Planning and Development
- 3 The Undergraduate Curriculum
- 4 Postgraduate Medical Education
- 5 Continuing Professional Development
- 6 The Hidden Curriculum
- 7 The International Dimension of Medical Education

The Medical School of the Future

John A Dent, Ronald M Harden and Dan Hunt

Trends

- The changing role of the medical teacher
- Students as partners in the education programme
- Reappraising the processes of selection, education and assessment
- Developing an authentic curriculum relevant to current needs.

Key concepts

- Authentic curriculum: real life activities which provide meaningful experiences relevant to real life tasks.
- Learnification: a process in which students participate as partners in the education programme.
- Programmatic assessment: a mixed-method assessment with quantitative and qualitative elements.

Introduction

We have seen significant development in medical education since the publication of the 5th Edition of a *Practical Guide for the Medical Teacher*. The concept of the authentic curriculum and the recognition that the 21st century learner will become the 21st century doctor has attracted increasing attention. Although not necessarily downgrading the acquisition of knowledge, greater emphasis has been placed on the application of knowledge and on the development of soft skills as part of a specification of content that addresses more generic competences. The move to describe the curriculum in terms of expected learning outcomes and experiences is now almost universally accepted with the specification of the outcomes as broader frameworks designed to influence the further development of the curriculum.



Tip

The COVID-19 pandemic should have a critical impact on how we should plan and deliver a medical education programme.

Medical education challenges

The history of the 21st century, it has been said, will be written as BC (Before Coronavirus) or AC (After Coronavirus). We can anticipate profound changes in every aspect of life, whether it be economics and employment, international relations, travel or leisure, and teaching or learning.

In the 'after Coronavirus era' we cannot expect teaching and learning to continue in the same way as before. At the time of going to press with this new edition, we are seeing a huge impact of the completely unanticipated COVID-19 pandemic which has necessitated a reappraisal and revision of educational practices. This has brought into sharp focus a need to bring about changes in how education is delivered. The ways in which we relate to, and work with, each other will also be different.



"How unfortunate that most famous people still haven't grasped what the grave new world will look like."

Burchill (2020)

The trends recognized before the current Coronavirus pandemic

Before the COVID-19 pandemic, a number of global trends already highlighted the need to review our approach to curriculum planning, teaching and learning and assessment. Trends included population growth and migration, poverty and substance abuse, comorbidity, the appearance of new diagnoses, the increasing role of social dimensions and mental healthcare, and an emphasis on preventative medicine and public health.

We also had a society with patients more informed, patients less available in hospital for teaching, and a greater emphasis on value for money. There was an expanding role for other healthcare professionals and a recognized need for interprofessional approaches to education. Students came to be seen as partners in the education programme, and as masters of their own learning – a process described by [Biesta \(2010\)](#) as ‘learnification’. At the same time, there was a move away from the transmission model of education and an increasing need recognized for students to develop skills of acquiring new knowledge as existing knowledge became obsolete.

Forecasting how medical education will respond to the pressures and requirements for change is notoriously unreliable. *Medical Teacher* published in 2018 a series of papers that described *The medical school of the future*. Among the ideas presented was a move away from the Flexnerian two-pillar model of medical education towards a recognition of the need for the inclusion of a third pillar of health systems science with the curriculum featuring technology-enhanced learning and learning analytics ([Samarasekera et al., 2018](#)). [Hamdy \(2018\)](#) described the adoption of an outcome/competency-based approach related to a healthcare system that was consistent with the economic, political, social and cultural systems of its country and integrated with all healthcare related facilities, including research centres and public/private partnerships.



Tip

Think about what the medical school of the future should look like.

Students as active learners engaged with a curriculum tailored to their personal needs with individual learning pathways, supported by a virtual learning environment was described by [Hays \(2018\)](#). [Jason \(2018\)](#) highlighted the important role in the future medical school of preparing the learner for their continuing professional development. Competency-based interprofessional education, a blurring of the boundaries between clinical and classroom settings and a seamless transition between undergraduate, postgraduate and continuing professional training, was described by [Davis \(2018\)](#).

A multiprofessional workforce as providers of traditional medical roles, a medical school focused on the public health of a geographic area, and the accreditation of

medical schools by a higher multidisciplinary body was described by [Wilkes \(2018\)](#). Innovation in curriculum planning, teaching and learning, and assessment embracing the continuing move to an authentic curriculum with just-in-time and adaptive learning, integration between the basic and clinical teaching, curriculum mapping, and increased collaboration between the different stakeholders in the delivery of the education programme was described by [Harden \(2018\)](#). Also anticipated was an increasing recognition of the importance of teachers and the development of students as partners in the learning process. Assessment will be fundamentally changed with a move to a programmatic approach.

These visions, alongside descriptions of current best practice, are reflected in chapters in this book.

Changes proposed or required after the Coronavirus pandemic

Response to the COVID-19 pandemic has required a more radical reappraisal of medical education with the need for significant changes from established practice. The trends in medical education should be examined through the lens of the COVID-19 pandemic in terms of our immediate response and a longer-term vision as to how medical education should be delivered.



"All is now flux in medical education where once all was stasis"

McManus (1995)

An AMEE Webinar series in March-April 2020 *Adapting to the impact of COVID-19* (<https://amee.org/covid-19>) discussed aspects of medical education where change is already taking place or can be expected. Problems relating to both undergraduate and postgraduate education were identified.

There is a need to pay attention to both student and faculty wellbeing, and staff and students should feel safe and supported. Problems relating to social isolation, to a psychologic shift in relation to new approaches to learning, and uncertainty about progression and graduation all require attention. Support and guidance is most important when students are dispersed. Approaches to communication between all of the stakeholders is important, as is the choice of a learning platform.

Skills are needed to allow students and teachers to cope with the changes. Required are agility and flexibility to adapt to change, compassion to support others with changing priorities and roles and with the impact of illness, and collegiality with a willingness to share advice, experience, and skills.

There must be a balance between synchronous and asynchronous learning and high-quality teaching offered, with appropriate use for digital learning. Assessment of students and selection of students for medical studies presents a particular challenge.



Tip

The COVID-19 pandemic and its associated problems provide an opportunity to rethink our overall approach to medical education.

The construction of a curriculum is complex and involves recognizing both traditional and many would say tested approaches while at the same time taking into account the need for a vision for the future that can be seen as a response to the current pressures, made more evident by the COVID-19 pandemic. We will need to see a digital

and a nondigital world, hopefully seamlessly connected. The AMEE ASPIRE-to-Excellence initiative encourages innovation, and innovation in medical education was recognized in 2020 as a theme meriting recognition of excellence.



"I will teach you in a room,

I will teach you now on 'Zoom'.

I will teach you in your house,

I will teach you with a mouse.

I will teach you here and there

I will teach because I care."

Anon. in the style of Dr Seuss, 2020

As described in this text, the role of the teacher in this new world will be different and what it means to be a teacher is a question that needs to be addressed. With increasing emphasis on online learning, how can the teacher best interact with students individually or as a group. Concern already has been expressed in recent years about less teacher autonomy as a result of the specification of learning outcomes and national examinations dictating the curriculum. The present pressures on education provide an opportunity to reconceptualize the role of a teacher.



"A medical curriculum should constantly develop in response to the needs of students, institutions and society."

Morrison (2003)

Because gathering for large meetings may be less possible or less socially acceptable, other forms of learning and sharing will also be necessary for continuing medical education. We have already seen the arrival of some online conferences (which can also be 'attended' synchronously or asynchronously), such as the AMEE 2020, The Virtual Conference.

Summary

The time is ripe for the application of many changes as we seek to develop the medical school of the future. Global awareness and local requirements should guide our choice of which to prioritize. Financial restraints and human resources will inevitably play a part, but exciting developments can be expected in many aspects of medical education as together we turn the immediate challenges of the COVID-19 pandemic into opportunities.

Despite the reality that human contact may be less frequent or more constrained than previously, there will always be an enduring role for a compassionate doctor-patient relationship. Other qualities described in the chapter and elsewhere in this book, along with care and kindness for those we teach or work with, will continue to be valued and important for the medical teacher.

References

- Biesta, 2010 Biesta GJJ. *Good education in an age of measurement: ethics – politics – democracy* Boulder CO: Paradigm Publishers; 2010.
- Burchill, 2020 Burchill, J. (2020). The plague month has shown us who the real stars are. <https://www.telegraph.co.uk/news/.../plague-month-has-shown-us-real-stars/>.
- Davis, 2018 Davis D. The medical school without walls: reflections on the future of medical education. *Medical Teacher*. 2018;40(10):1004–1009.
- Hamdy, 2018 Hamdy H. Medical college of the future: from informative to transformative. *Medical Teacher*. 2018;40(10):986–989.
- Harden, 2018 Harden RM. Ten key features of the future medical school – not an impossible dream. *Medical Teacher*. 2018;40(10):1010–1015.
- Hays, 2018 Hays R. Establishing a new medical school: a contemporary approach to personalizing medical education. *Medical Teacher*. 2018;40(10):990–995.
- Jason, 2018 Jason H. Future medical education: preparing, priorities, possibilities. *Medical Teacher*. 2018;40(10):996–1003.
- McManus, 1995 McManus IC. New pathways to medical education: learning to learn at Harvard Medical School. *BMJ (Clinical Research ed.)*. 1995;311(6996):67.
- Morrison, 2003 Morrison J. ABC of learning and teaching in medicine: evaluation. *BMJ (Clinical Research ed.)*. 2003;326(7385):385–387.
- Samarasekera et al., 2018 Samarasekera DD, Goh PS, Lee SS, et al. The clarion call for a third wave in medical education to optimise healthcare in the twenty-first century. *Medical Teacher*. 2018;40(10):982–985.
- Wilkes, 2018 Wilkes M. Medical school in 2029. *Medical Teacher*. 2018;40(10):1016–1019.

Curriculum Planning and Development

Mark Edward Quirk and Ronald M Harden

Trends

- Careful and continuous monitoring of the taught curriculum in relation to the declared curriculum and learner outcomes is necessary.
- Recent curriculum reform targets the process and skills of thinking and the ability to adapt to situations as much as the knowledge base of learners.
- Curriculum planning should require the use of new tools, such as predictive analytics and dynamic curriculum mapping.

Key concepts

- Curriculum: a pathway to learning that includes what is declared, taught and learned, as well as the other aspects of the learning environment that run parallel to the formal curriculum. An adaptive curriculum is one in which the student, the professor, and the content are each simultaneously and synergistically adapting to each other aligned with the purpose of accelerating student learning.
- Curriculum development: a systematic approach to matching students' learning experiences to expected learning outcomes. Defining outcomes and monitoring progress are as essential as identifying and organizing content and choosing appropriate methods of teaching.

Introduction

The torrid pace of medical advances mandates a new paradigm for curriculum development. The concept of transformation should be viewed as a continuous process woven into the fabric of grassroots medical teaching and learning, rather than an 'every 5-year institutional-level' event. The new paradigm reinforces the age-old features of curriculum development, such as defining objectives methods and evaluation. It also introduces novel features, such as predicting and tracking outcomes to modify the delivered curriculum. The days are now past when the teacher produced a curriculum like a magician produced a rabbit out of a hat, when the lecturer taught whatever attracted his or her interest and when the students' clinical training was limited to the patients who happened to present during a clinical attachment. It is now accepted that careful and continuous planning informed by monitoring outcomes is necessary if the programme of teaching and learning is to be successful.



"No one would cheer more loudly for a change than Abraham Flexner ... The flexibility and freedom to change – indeed, the mandate to do so – were part of Flexner's essential message."

Cooke et al. (2006)

What is a curriculum?

A curriculum is more than just a syllabus or a statement of content. A curriculum is about what should happen in a teaching programme – about the intention of the teachers, about the way they make this happen and judge the results. This extended vision of a curriculum is illustrated in [Fig. 2.1](#). Curriculum planning can be considered in 10 steps ([Harden, 1986](#)). This chapter looks at these steps and the changes in emphasis since the publication of the fifth edition of the text.

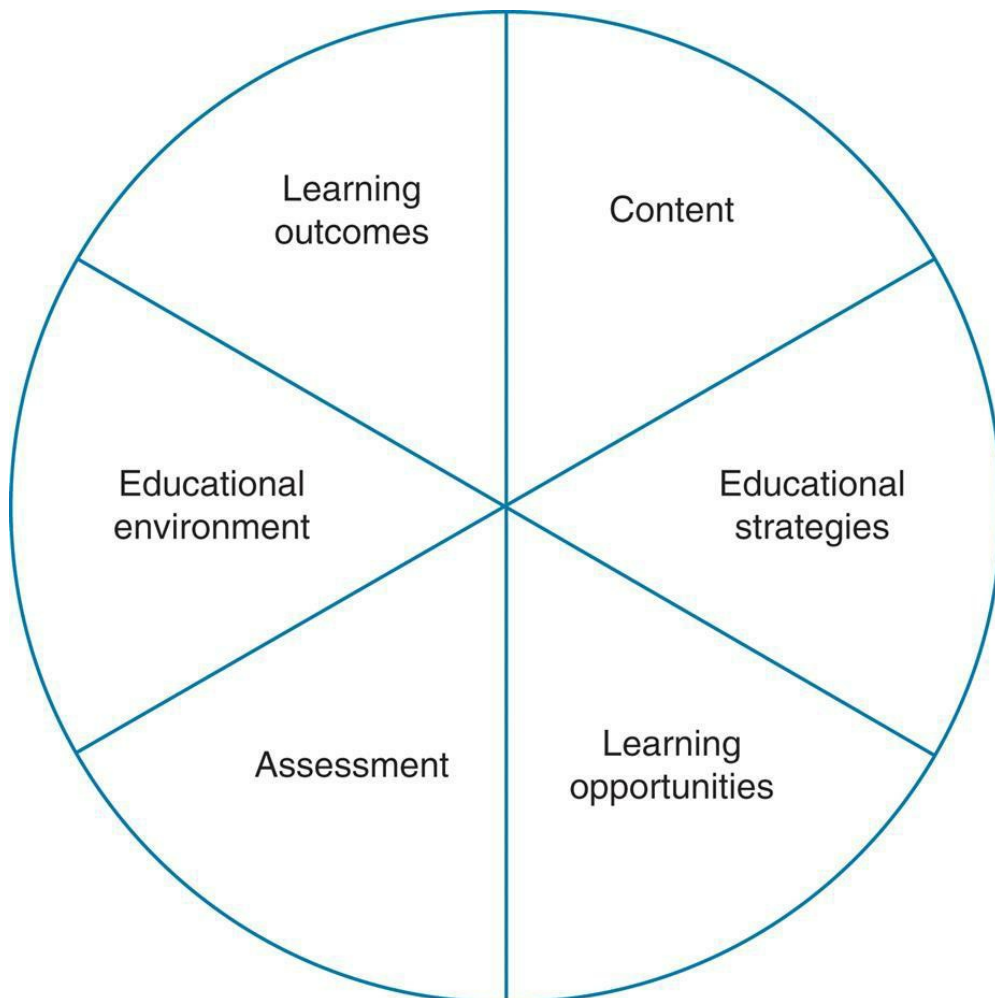


FIG. 2.1 An extended vision of a curriculum.



Tip

The 10 steps described provide a useful checklist for planning and evaluating a

curriculum.

Identifying the need

The relevance of modern educational curricula has been questioned by [Cooke et al. \(2010\)](#). Glaring insufficiencies have been noted in health promotion and wellness, preventative medicine, health system science, interprofessional education and sociocultural and community accountability ([Gonzalo et al., 2017](#); [Dyrbye et al., 2019](#); [Rourke, 2018](#)). The context in which the learner will practice, and the way they will continuously learn from their practices, are increasingly recognized as important needs.

A range of approaches can be used to identify these curriculum needs ([Dunn et al., 1985](#)):

- The ‘wise men’ approach. Senior teachers and practitioners from different specialty backgrounds reach consensus.
- Consultation with stakeholders. Members of the public, patients, government and other professions are sought.
- A study of errors in practice. Quality assurance.
- Critical-incident studies. Individuals describe key medical incidents that represent good or bad practice.
- Task analysis. Behaviour observation.
- Study of star performers. Behaviour observation of those with special competencies.

Establishing the learning outcomes



If you leave this book with only one idea, it should be the concept of outcome-based education.

One of the big ideas in medical education over the past two decades has been that learning outcomes must drive curriculum planning ([Harden, 2007](#)). In outcome-based curriculum (see [Ch. 16](#)), the defined learning outcomes are defined and measured and inform decisions about the curriculum and curriculum development. What matters most are the learning outcomes.

Since the work of Bloom, Mager and others in the 1960s and 1970s, the value of setting out the objectives of a training programme has been recognized. In practice, however, long lists of objectives have proved unworkable and have been ignored in implementing a curriculum. In recent years, the move to a competency-based curriculum with specified outcome frameworks has gained momentum and is increasingly dominating education thinking.

Agreeing on the content

The content of a textbook is outlined in the content pages and in the index. The content of a curriculum is described in the syllabus with topics covered in lectures and other learning opportunities. Traditionally, there has been an emphasis on knowledge, and this has been reflected in student assessment. Content addressing skills (including thinking) and attitudes is increasingly recognized as important. Also, emphasis is now placed on an authentic curriculum – one where the content is more closely related to the work of the practicing doctor. Basic science content is considered in the context of clinical medicine.

The content of the curriculum can be presented from a number of perspectives:

- subjects or disciplines (traditional)
- body systems, for example, the cardiovascular system (integrated)
- the life cycle, for example, childhood, adulthood
- problems (problem-based)
- clinical presentations or tasks (case or task-based)

These are not mutually exclusive; grids can be prepared, which look at the content of a curriculum from two or more of these perspectives.

No account of curriculum content would be complete without reference to 'the types of curriculum.' The 'declared' curriculum is the curriculum as set out in the institution's documents. The 'taught' curriculum is what is presented by the teacher 'in the classroom and in practice.' The 'parallel' curriculum is the space where students learn the material 'their way,' largely making use of learning apps, websites and other features of the electronic learning landscape. This 'parallel curriculum' runs alongside the taught curriculum and is largely unrecognized and underused by faculty and curriculum developers. The 'learned' curriculum is the total of what is learned by the student. The 'hidden' curriculum is the students' informal learning that is different from what is taught ([Fig. 2.2](#); see [Ch. 6](#)). Both the taught and learned curricula are embedded in 'the learning environment' that reflects the values, attitudes and educational philosophy of the academic leaders and faculty.

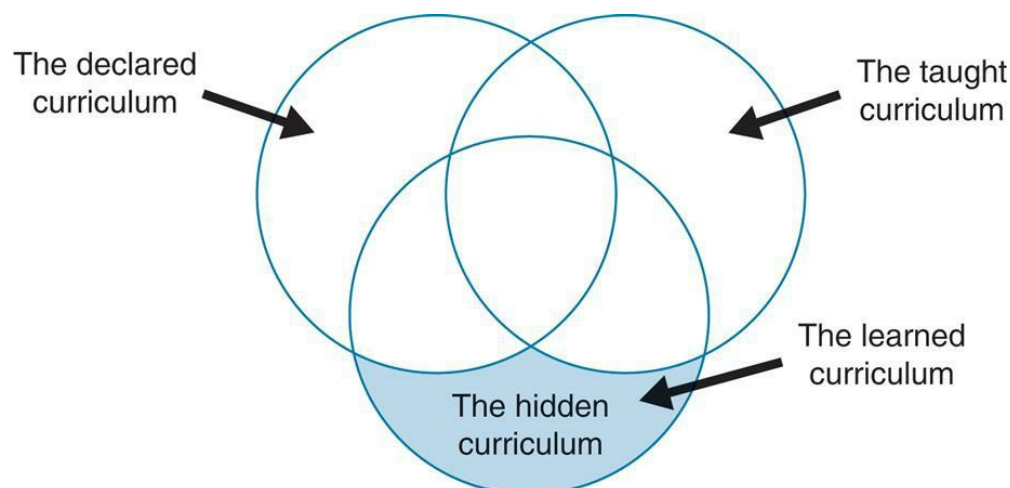


FIG. 2.2 The hidden curriculum.

Experience as core content

Knowledge and action provide the foundation upon which metacognitive mental operations define experience and guide learning in both the basic and clinical science curricula. Metacognition is thinking about one's own or another's thinking and feeling. This thinking process underlies several 'higher-order' thinking skills, such as clinical decision making, reflection, communication and perspective-taking, self-assessment and planning (Quirk, 2006). Recent curriculum reform targets the process and skills of thinking as much as the medical knowledge base of learners. Referring to the 'new curriculum', Charles Hundert, Dean of Harvard Medical School states: "*Medical education is not about the transmission of information but about the transformation of the learner*" (Shaw, 2015). The aim is to prepare a learner to demonstrate mastery of core skills and the ability to adapt to new situations (Carbonell, et al., 2014; Quirk & Chumley, 2018).

Organizing the content

An assumption in a traditional medical curriculum was that students should first master the basic medical sciences before moving on to study clinical medicine. Too often students failed to see the relevance of what was taught to their future career as doctors, and after they had passed examinations in the basic sciences, they tended to forget or ignore what they had learned.

Some would argue that the curriculum should be turned on its head, with students starting to think like a health professional from the day they enter medical school. Students at Hofstra Medical School, New York spent their first 8 weeks working as paramedics. On their first day at the University of California, San Francisco Medical School students were assigned to a healthcare team where they would play a significant role and learn about healthcare systems. In a vertically integrated curriculum, students are introduced to clinical medicine and to systems-based practice alongside the basic sciences in the early years of the programme and continue their studies of the basic sciences applied to clinical medicine within a systems framework in the later years.

A spiral curriculum (Fig. 2.3) offers a useful approach to the organization of content (Harden & Stamper, 1999):

- there is iterative revisiting of topics throughout the course at different levels of difficulty
- new learning is related to previous learning
- the competence of students increases with each visit to a topic

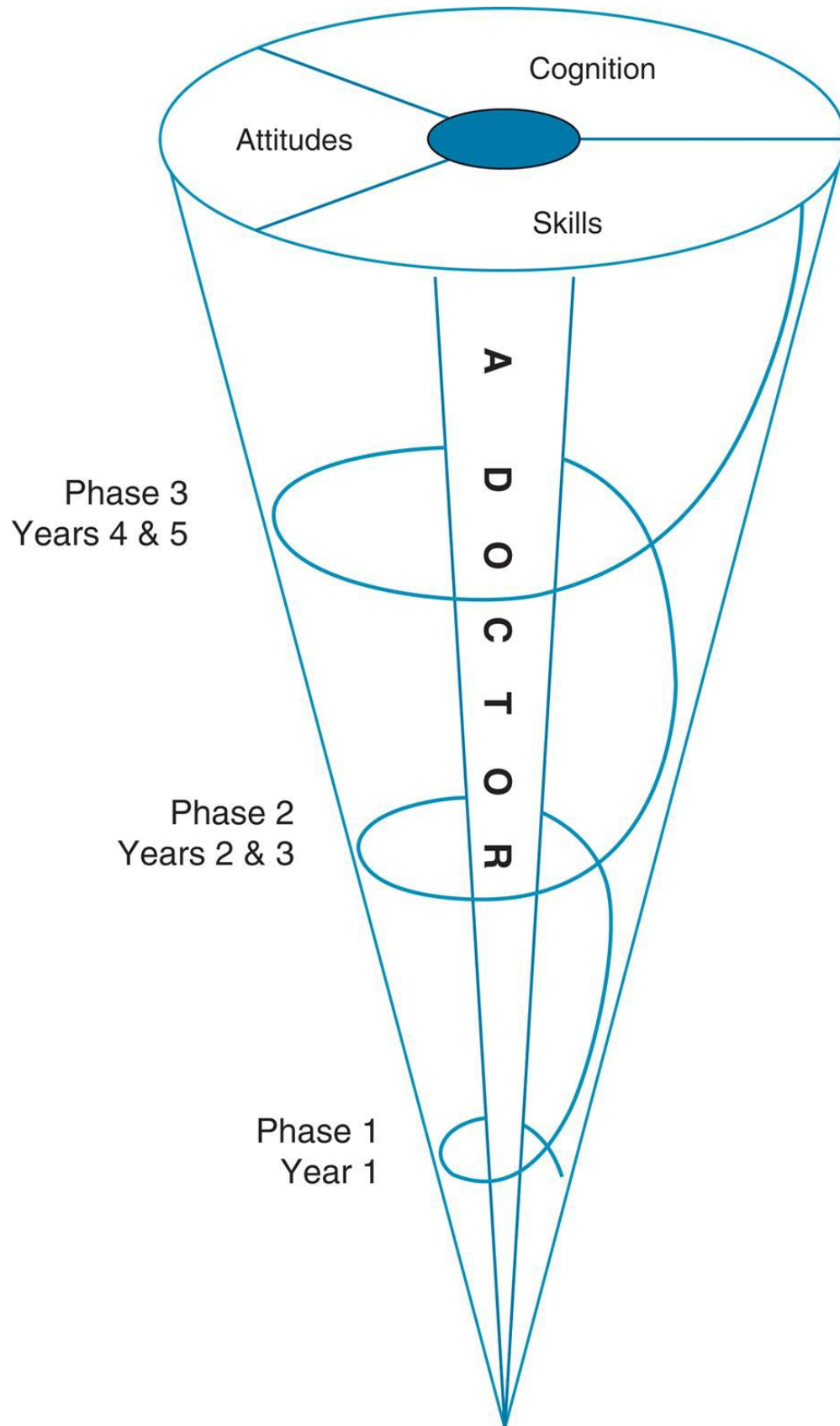


FIG. 2.3 A spiral curriculum.

Deciding the educational strategy



Tip

In planning a curriculum, use the SPICES model to assess needs.

Much discussion and controversy in medical education has related to education strategies. The SPICES model ([Fig. 2.4](#)) offers a useful tool for planning a new or evaluating an existing curriculum ([Harden et al., 1984](#)). Each strategy is viewed on a continuum, avoiding the polarizing of opinion and acknowledging that schools may vary in their approach.

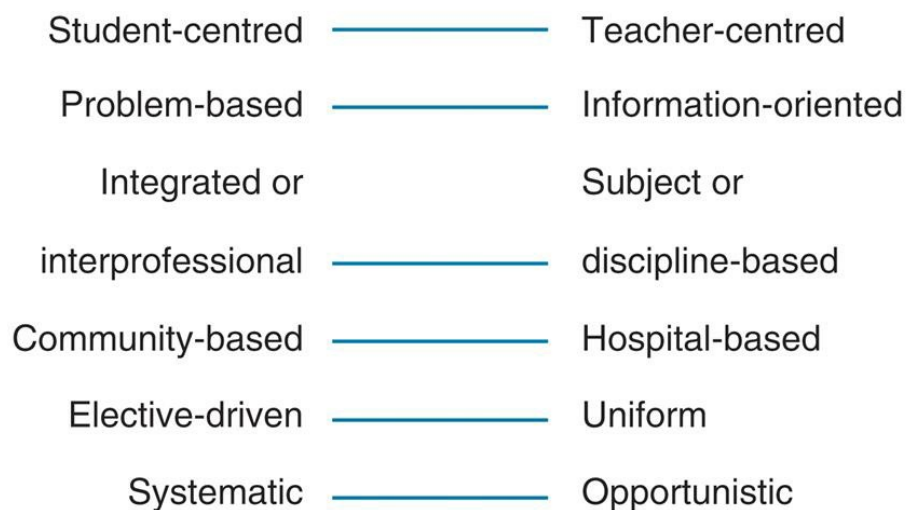


FIG. 2.4 SPICES model of educational strategies.

Student-centred learning

In student-centred learning, students are given more responsibility for their education. What the student learns matters more than what is taught. The teacher is a facilitator or guide in the student's learning journey. This is discussed further in [Chapter 15](#) on independent learning.

With a greater understanding of how students learn and with advances in learning techniques, we see a move to an adaptive curriculum, where the content, teaching and learning are tailored to the personal needs of the individual learner ([Quirk & Chumley,](#)

2018). This includes the use of new tools for travelling the educational pathway, using predictive analytics and dynamic curriculum mapping. Students spend different amounts of time studying a unit depending on their learning needs and the milestones achieved, often spending more time in the parallel curriculum than in the taught curriculum. Each student's mastery of the learning outcomes should be continuously assessed during the course, and at times when further study can be arranged depending on the student's needs.

Problem-oriented learning

Problem-based learning (PBL) described in [Chapter 18](#), continues to attract attention. Digital technologies can be used to present the problem or as a source of information to guide the student's learning. PBL is used not only with students working in small groups but also in the context of large groups, in individualized learning or with students working at a distance. Eleven steps can be recognized in the PBL continuum ([Harden & Davis, 1998](#)).

In team-based learning (TBL), students learn from, and teach, their peers in clusters within the larger class. It mirrors the 'authentic curriculum' in which students will learn as practitioners for the remainder of their professional lives. TBL provides an ideal context in which to teach basic science knowledge, as well as metacognitive competencies required for problem-solving, communication and evidence-based medicine ([Parmalee et al., 2012](#); [Koles et al., 2010](#)).

Integration and interprofessional learning

Horizontal and vertical integration have become standard features of many medical school curricula. This is discussed further in [Chapter 17](#). Eleven steps on a continuum between discipline-based and integrated teaching have been described ([Harden, 2000](#)).

Integration of the curriculum now includes across the healthcare professions ([Hammick et al., 2007](#)). Increasingly, medical students are learning alongside nursing and other health professional students in the taught and parallel curricula learning about perspectives and teamwork ([Dow & Thibault, 2017](#)). This is discussed further in [Chapter 18](#).

Clinical authenticity

We have broadened the 'C' in spices to include the multiplicity of clinical settings that capture modern, team-based medicine. Wherever possible, these authentic settings should provide the context for medical curricula. There is a wide range of options depending upon the competencies and objectives to be addressed. Behavioural health clinics, homeless shelters, disaster medicine Red Cross programmes, nursing homes and family practice clinics are but a few examples. There are strong educational and logistical arguments for placing less emphasis on hospital-based programmes and more emphasis on the community as a context for student learning. This is discussed further in [Chapters 11 and 12](#).

A truly authentic curriculum will integrate basic and clinical science learning in the

healthcare setting ([Harden, 2000](#)). When continuous clinical placements are not possible, driving authenticity through teaching in the classroom and small group settings with clinical cases and simulation are the best options ([Quirk & Chumley, 2018](#)). A truly integrated authentic curriculum will engage the student in experiential case-based learning and progressively greater responsibility in clinical settings.

Electives

It is no longer possible for students to study in depth all topics in a required curriculum. Electives provide students with the opportunity to study areas of interest to them, while at the same time developing skills in critical appraisal, self-assessment and time management. In most medical schools, electives are offered late in training to enable students to gain greater depth in medical specialties. However, one literature review found 37 elective types, including topics such as humanities, lifestyle and clinical skills in the 'preclinical medical school curriculum' ([Agarwal et al., 2015](#)).

Systematic approach to curriculum development

A systematic approach to curriculum planning is necessary to ensure that students have learning experiences that match the expected learning outcomes and that the core curriculum includes the competences essential for medical practice.



Tip

Think of the curriculum as a planned educational experience.

The future will see greater use made of continuous curriculum mapping where the students' progress through the curriculum is charted across the learning experiences, the assessments and the learning outcomes. Using artificial intelligence (AI) in the adaptive curriculum, these real time data are then fed back not only to curriculum developers but to the learners themselves to make adjustments and learn more effectively and efficiently. A range of methods can be used to record encounters that students have with patients to help identify gaps and redundancies in the students' experiences.

Choosing the teaching methods

A good teacher facilitates the students' learning by making use of a range of methods selected to achieve specific outcomes.

The lecture remains powerful tools if used properly. Students need not be passive, and their role is more than one of information receiver. New strategies, such as TBL and 'flipped' classrooms provide opportunities for greater learner engagement in the lecture setting.

Small groups foster interaction between students and make it possible for students to

learn from each other. Independent learning provides an ideal context for some outcomes. Students master the area being studied and learn to take responsibility for their own learning. Faculty can create more effective 'co-dependent' learning situations by meeting the students half-way in the 'parallel curriculum' to guide and reinforce their learning.



Tip

There is no holy grail of instructional wizardry that will provide a solution to all teaching problems. The teacher's toolkit should contain a variety of approaches, each with its strengths and weaknesses.

A significant development in recent years has been the application of new learning technologies, including simulation and e-learning. Computers may be used as a source of information, to present interactive patient simulations, to facilitate and manage learning and to support collaborative or peer-to-peer learning. Synchronous activities, such as video conferencing and Massive Open Online Courses, as well as asynchronous interactive methods involving online case-based modules and simulation enable educators to overcome traditional curricular constraints of time and space.



"The move from desktop PCs to laptops, smart phones and tablets has increased the possibilities of learning closer to clinical patient experience, so called 'near patient learning', where students can access learning resources just prior to or just after seeing and interacting with patients."

Roberts, 2012

Preparing the assessment

Student assessment is a key component of the curriculum and is addressed in Section 5 of this book. The significant effect that examinations have on student learning is well documented.



"I believe that teaching without testing is like cooking without tasting."

Ian Lang, former Scottish Secretary

Issues that should be addressed in assessment include:

1. What should be assessed?
 - A blueprint should be prepared relating the assessment to the specific

learning outcomes.

This should include knowledge, skills and attitudes and is often an available option with assessment software.

- How should it be assessed?

A written approach to knowledge and application, such as multiple-choice questions or constructed response questions

- a performance assessment, such as an Objective Structured Clinical Examination
- a collection of evidence, such as in a portfolio.

2. What are the aims of the assessment process?

- grade the student
- provide the student and teacher with feedback (assessment for learning)
- motivate the student

3. When should students be assessed?

- at the beginning of the course to assess what they already know or can do
- during the course as formative assessment
- at the end of the course to assess their achievement of the expected learning outcomes.

4. Who should assess the student?

- A national or international body, the medical school, the teachers or student peers
- Increasing attention should be paid to self-assessment, a skill required for lifelong practice-based learning. The evidence suggests that physicians are not equipped to do so (Davis et al., 2006).

Communication about the curriculum

Failure of communication between teacher and student is a common problem in medical education (Fig. 2.5).

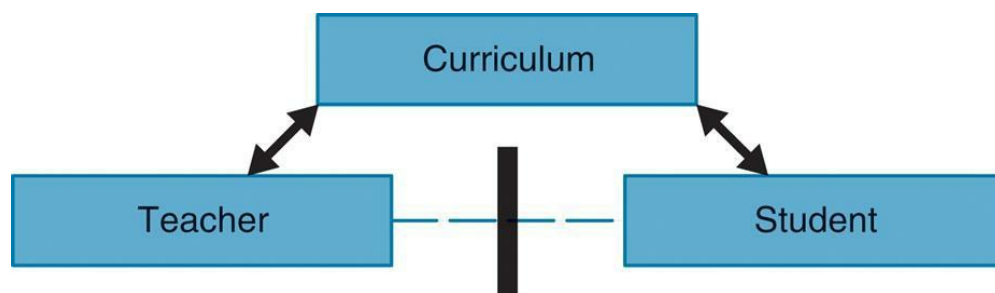


FIG. 2.5 Failure in communication.

Teachers have the responsibility to ensure that students have a clear understanding of:

- what they should be learning

- their access to the range of learning experiences and opportunities available
- how they can match the available learning experiences to their own personal needs
- whether they have mastered the topic or not, and if not, what further studies and experiences are required



Tip

Failure to keep staff and students informed about the curriculum is a common recipe for failure.

Communication can be improved by providing students with:

- a clear statement of the learning outcomes expected at each stage of the curriculum
- a curriculum map that matches the learning outcomes to the learning experiences and the assessment
- a study guide that helps the students to manage their learning and make the best use of their time.

Promoting an appropriate educational or learning environment

The educational environment or 'climate' is a key aspect of the curriculum ([Genn, 2001](#)).



Tip

Measurement of the education environment should be part of a curriculum evaluation.

There is little point in 'declaring' a curriculum where an aim is to orient the student to medicine in the community and to health promotion if the students perceive that what is valued by the senior teachers is hospital practice, curative medicine and research. In the same way, it is difficult to develop in students a spirit of teamwork and collaboration if the environment in the medical school is a competitive rather than a collaborative one.

Tools to assess the educational environment, such as the Dundee Ready Education Environment Measure are available. A major study of the learning environment implemented by the American Medical Association involved 28 medical schools and tracked perceptions of faculty and peer support, competition for grades, integration of basic and clinical sciences over 4 years of the medical curriculum ([Skochelek et al.](#),

2016).

Managing the curriculum

Attention to curriculum management has become more important with

- increasing complexity of the curriculum, including integrated and interdisciplinary teaching
- increasing pressures on staff with regard to their clinical duties, teaching responsibilities and research commitments
- distributed learning on different sites
- increased demands and increased student numbers at a time of financial constraints
- changes in the healthcare system and medical practice
- increasing demands for accountability

In the context of undergraduate medical schools, it is likely that:

- responsibilities and resources for teaching will be at a faculty rather than departmental level
- an undergraduate medical education committee will be responsible for planning and implementing the curriculum
- a teaching dean or director of undergraduate medical education will be appointed who has a commitment to curriculum development and implementation
- staff will be appointed with particular expertise in curriculum planning, teaching methods and assessment to support work on the curriculum
- time and contributions made by staff to teaching will be recognized
- a staff development programme will be a requirement for all staff
- an independent group will have responsibility for academic standards and quality assurance

There are similar requirements with respect to postgraduate education.

Curriculum management is data management. Theoretical and technologic advances greatly enhance our ability to not only manage the curriculum but transform it into a dynamic, personal learning experience.

Teachers and learners together transform the educational process by grounding their actions and decisions about direction, meaning and performance in heretofore largely untapped descriptive and predictive data. These data can be used to improve accuracy of self-assessments, as well as predict future performance for decision making by multiple stakeholders in the organic curriculum ([Pusic et al., 2015](#); [US Department of Education, 2012](#)).

Mining the data of the multifaceted curriculum for analytic purposes is captured in a dynamic interpretation of the curriculum map. The capacity for the curriculum to constitute a whole greater than the sum of its parts and the map to be used to navigate the territory is foreshadowed by [Harden \(2001\)](#). New technologies and approaches to

data enable us to 'take a satellite view' of the multidimensional map akin to a Global Positioning System. The concept of a Curriculum Positioning System offers a dynamic interactive educational tool that enables stakeholders to establish performance 'destinations,' methods of transportation with 'waypoints' or milestones (along with estimated time of arrival), plot courses for learning with personalized alternative routes, reflect on the journeys and renew future teaching and learning plans.

A final word: in any major curriculum revision, do not expect to get it right first time. The curriculum will continue to evolve and will need to change in response to local circumstances and to changes in medicine.



"A little known fact is that the Apollo moon missions were on course less than 1% of the time. The mission was composed of almost constant mid-course corrections."

Belasco, 1996

Summary

The concept of curriculum reform should be viewed on a continuum rather than a recurring event. This chapter provides 10 steps that serve as a useful checklist for monitoring the process. The following is a summary of each step.

1. The training programme is intended to fulfil the goals and objectives. These have been expanded to include population medicine and the healthcare system.
2. The expected and explicit student learning outcomes should inform all decisions about curriculum development.
3. The content should include basic and clinical knowledge plus the values, attitudes and educational philosophy of the academic leaders and faculty. The process and skills of thinking should also be emphasized.
4. The organization of the content, including the sequence in which it is covered, is a critical factor to consider. There is growing sentiment among educational leaders that medical students learn about the healthcare system from the day they enter medical school.
5. The educational strategies should strive to help the learner integrate knowledge for use.
6. The teaching methods used should include an appropriate blend of large-group teaching, small-group teaching and the use of new learning technologies matched to the level of learning objectives. Emphasis on personalized learning has opened the door to asynchronous digital teaching underlying new mobile platforms and group techniques like the flipped classroom.
7. Assessment of the students' progress should tie explicitly to specific learning outcomes related to knowledge, skills and attitudes.
8. The declared curriculum, including objectives and assessments, should be exposed and readily available to all the stakeholders, including the students.
9. The parallel curriculum is where students study outside the formal curriculum and should be included in the measurement of the educational environment.
10. In this dynamic model, the curriculum map serves as an opportunity to manage and develop the curriculum. It presents an opportunity to compare the declared and the delivered curricula in relation to learning outcomes.

Although there is a loose chronologic sequence to these steps, we recognize that process of curriculum development is much more a spiral than a linear process. In addition, any step could mark the 'entry point' to the process depending upon needs and context.

References

- Agarwal et al., 2015 Agarwal A, Wong S, Sarfaty S, et al. Elective courses for medical students during the preclinical curriculum: a systematic review and evaluation. *Medical Education Online*. 2015;20:26615.
- Carbonell et al., 2014 Carbonell KB, Stalmeijer RE, Konings KD, et al. How experts deal with novel situations: a review of adaptive expertise. *Educational Research and Reviews*. 2014;12:14–29.
- Cooke et al., 2010 Cooke M, Irby DM, O'Brien BC. *Educating physicians: a call for reform of medical schools and residency* San Francisco: Jossey-Bass; 2010.
- Cooke et al., 2006 Cooke M, Irby DM, Sullivan W, Ludmerer KM. American Medical Education 100 Years after the Flexner Report. *New England Journal of Medicine*. 2006;355:1339–1344.
- Davis et al., 2006 Davis DA, Mazmanian PE, Fordis M, et al. Accuracy of physician self-assessment compared with observed measures of competence. *Journal of American Medical Association*. 2006;296(9):1094–1102.
- Dow and Thibault, 2017 Dow A, Thibault G. Interprofessional education – a foundation for a new approach to health care. *New England Journal of Medicine*. 2017;377(9):803–805.
- Dunn et al., 1985 Dunn WR, Hamilton DD, Harden RM. Techniques of identifying competencies needed by doctors. *Medical Teacher*. 1985;7(1):15–25.
- Dyrbye et al., 2019 Dyrbye LN, Sciolla AF, Dekhtyar M, et al. Medical school strategies to address student well-being: a national survey. *Academic Medicine*. 2019;94(6):861–868.
- Genn, 2001 Genn, J. M. (2001). AMEE medical education guide no. 23. Curriculum, environment, climate, quality and change in medical education – a unifying perspective. AMEE, Dundee.
- Gonzalo et al., 2017 Gonzalo JD, Dekhtyar M, Starr SR, et al. Health systems science curricula in undergraduate medical education: identifying and defining a potential curricular framework. *Academic Medicine*. 2017;92(1):123–131.
- Hammick et al., 2007 Hammick M, Freeth D, Koppel I, Reeves S, Barr H. A Best Evidence Systematic Review of Interprofessional Education: BEME Guide no 9. *Medical Teacher*. 2007;29:735–751
<https://doi.org/10.1080/01421590701682576>.

- [Harden, 1986](#) Harden RM. Ten questions to ask when planning a course or curriculum. *Medical Education*. 1986;20:356–365.
- Harden, 2000 Harden RM. The integration ladder: a tool for curriculum planning and evaluation. *Medical Education*. 2000;34:551–557.
- [Harden, 2001](#) Harden RM. AMEE guide number 21: curriculum mapping: a tool for transparent and authentic teaching and learning. *Medical Teacher*. 2001;23(2):123–137.
- [Harden, 2007](#) Harden RM. Outcome-based education: the future is today. *Medical Teacher*. 2007;29:625–629.
- Harden et al., 2000 Harden RM, Crosby JR, Davis MH, et al. Task-based learning: the answer to integration and problem-based learning in the clinical years. *Medical Education*. 2000;34:391–397.
- [Harden and Davis, 1998](#) Harden RM, Davis MH. The continuum of problem-based learning. *Medical Teacher*. 1998;20(4):301–306.
- [Harden et al., 1984](#) Harden RM, Sowden S, Dunn WR. Some educational strategies in curriculum development: the SPICES model. *Medical Education*. 1984;18:284–297.
- [Harden and Stamper, 1999](#) Harden RM, Stamper N. What is a spiral curriculum?. *Medical Teacher*. 1999;21(2):141–143.
- [Koles et al., 2010](#) Koles PG, Stolfi A, Borges NJ, Nelson S, Parmelee DX. The impact of team-based learning on medical students' academic performance. *Acad Med: J Assoc Am Med Coll*. 2010;85(11):1739–1745 <https://doi.org/10.1097/ACM.0b013e3181f52bed>.
- [Parmelee et al., 2012](#) Parmelee D, Michaelsen LK, Cook S, Hudes PD. Team-based learning: a practical guide: AMEE guide no 65. *Medical Teacher*. 2012;34(5):e275–287.
- [Pusic et al., 2015](#) Pusic M, Boutis K, Hatala R, Cook D. Learning curves in health professions education. *Academic Medicine*. 2015;90(8):1034–1042.
- [Quirk, 2006](#) Quirk M. *Intuition and metacognition in medical education; keys to expertise* Springer 2006.
- Quirk and Chumley, 2018 Quirk M, Chumley H. The Adaptive Medical Curriculum: a model for continuous improvement. *Medical Teacher*. 2018;40(8):786–790.
- [Rourke, 2018](#) Rourke J. Social accountability: a framework for medical schools to improve the health of the populations they serve. *Academic Medicine*. 2018;93(8):1120–1124.
- [Shaw, 2015](#) Shaw, J. (2015). Rethinking the medical curriculum. Harvard Magazine.

[Skochelak et al., 2016](#) Skochelak S, Stansfield RB, Dunham L, et al. Medical student perceptions of the learning environment at the end of the first year: a 28 medical school collaborative. *Academic Medicine*. 2016;91(9):1257–1262.

[US Department of Education Office of Education Enhancing Teaching and Learning Report, 2012](#) US Department of Education Office of Education Enhancing Teaching and Learning Report. Technology 2012.

The Undergraduate Curriculum

Joel Lanphear and Marie Matte

Trends

- Curriculum design has evolved from simply having quality courses as 'stepping stones', to designs that integrate all content across the educational programme.
- Making meaningful links between the stages of training from premed to undergraduate to postgraduate and into practice is one of the most enduring challenges today.
- Alignment of content along the continuum of medical education through systematic cascade of learning objectives is one tool used to ensure integration of content and transition to the next level of learning.
- Curriculum design models are evolving to ensure medical educators are aware of the unique place undergraduate medical education holds along the continuum of medical education.

Key concepts

- Curriculum map: a document outlining the specific link(s) between the individual student learning objectives (as defined by the programme), and the overarching educational programme objectives. The map provides students, administrators, and faculty with a tool that insures what is expected of the student in terms of learning and assessment of student performance aligns with the overall mission of the school.
- Curriculum: a complete set of learning activities and specific learning objectives that together encompass the desired learning outcomes of the graduates of the curriculum. In a continuum of education, one curriculum may provide the foundation for further, more advanced learning.
- Curriculum management: the processes involved in insuring students are meeting learning goals and objectives at specified times and to specific academic standards throughout the curriculum. These processes, which involve assessment of student performance and programme evaluation, are largely carried out by programme faculty.
- Assessment and evaluation: often used interchangeably. It is useful to make a distinction by defining assessment as the measure of student performance and evaluation as a measure of programme (curriculum) performance.



"The undergraduate medical curriculum is often viewed simultaneously as the cause and solution to issues facing medicine today."

Lanphear, 2020

Introduction

In [Chapter 2](#) Quirk and Harden defined a new curriculum paradigm as “a process involving definition of objectives, methods and evaluation and includes predicting and tracking curriculum outcomes”. When one examines the depth and breadth of a physician's education and training, the objectives, methods, evaluation and the outcome measures should be organized along a continuum that begins with the educational experiences of students before matriculation to medical school and leads in many countries to postgraduate or specialty training. In keeping with this definition, the undergraduate medical curriculum occupies a unique space along what is often called a *continuum of medical education*. A continuum is defined as “a coherent whole characterized as a collection, sequence or progression of values or elements varying by minute degrees” ([Merriam-Webster, 2003](#)). This continuum of medical education includes not only the premedical experiences, but the undergraduate medical education, graduate medical education and continuing professional education experiences. The stages in the development of a physician must be sequenced and implemented in such a way as to prepare the learner for a career based in the process of lifelong learning ([Kruse, 2013](#)).

Although the continuum appears to represent a rather smooth succession along a linear course, in practice, the stages have been implemented more as separate entities placed upon one another over specified periods of time, more as one would picture building blocks ([Petersdorf, 1994](#)). In considering the undergraduate medical curriculum, an awareness and consideration for where students have been in their educational journey must help to inform the tasks that lie ahead in their first foray into medicine, that is, the creation of as smooth a transition as possible along a complicated and varied continuum.

Medical educators have the responsibility therefore to improve the transition between each stage of learning along the continuum by examining outcome measures for each stage and designing a curriculum that aligns with these measures. Educators recommend working with the ‘final product in mind’ as each level of competency is developed along the continuum. In many countries, there are different licensing organizations for each stage of the learning continuum rather than one single coordinating agency. Until a more coherent licensing model is created, it is incumbent upon medical educators to facilitate transitions between stages.

In addition to its unique place between preprofessional and postgraduate training, the undergraduate curriculum presents students as learners with challenges and opportunities, many of which are entirely new and unique to them. The rate at which learning occurs, and the amount of information learners are expected to master has been described as the difference between ‘drinking from a water fountain and a fire hose’. Many learners enter medical school having performed at high levels of academic achievement in prior pre- and postsecondary courses and have performed well on admissions tests and in interview processes. In fact, they are now among a group of students who for a large part have similar abilities and goals. It may be a unique

experience for some to realize that they are among true academic equals. As the medical school experience is demanding and distinctive, medical schools need to provide for student support for these experiences. However, in many instances, learners will realize that their peers all have talents and unique sets of skills that can be drawn upon as support in a positive way.

As part of the medical curriculum, students will encounter illness, disease and death at a very personal level as they engage in some form of simulated or actual patient care encounter. And although each has met their goal of medical school admission, each will also respond differently to experiences they have in the laboratory, classroom and clinical contexts ([Corrigan et al., 2010](#)). Medical schools and faculty have developed a sensitivity to these issues and have developed active and ongoing systems to assist. It is useful to keep in mind that by explaining to students the intent of the curriculum design, this will draw upon the power of metacognition, which describes the process of a deeper learning experience when we think about what and how we are learning.

A medical school that employs team-based, problem-based and case-based small-group learning as primary curriculum activities often provide some form of orientation to this type of learning, including the opportunity to practice in this learning environment to ensure the greatest productivity for each student can be achieved ([McCrorie, 2010](#)).

Finally, it is important for those developing curricular models and content to acknowledge that medical students arrive at medical school with a variety of background experiences, knowledge, skills and attitudes from prior learning. They do not arrive as in Aristotle's words with a *tabula rosa* or blank slate ([Aristotle](#)) in their repertoires. It is appropriate to assume that a student's background will have an impact on how they approach their learning, just as the planned learning experiences will impact their achievement of the goals and objectives of the programme in terms of learning, behaviours, clinical decision making and clinical and communication skill development. It is important therefore during the process of selection of medical students that a student's previous experiences be considered.



Tip

In designing the undergraduate curriculum, it is important to consider the experiences students bring with them to medical school, and those that lie ahead along the continuum of medical education.

Forces shaping the curriculum

Conceptually, the undergraduate medical curriculum should provide the necessary clinical skills and knowledge to succeed at the next stages of the continuum. At a minimum, this includes a clear understanding of the basic medical, clinical and social sciences as explanatory to the process of wellness and disease in the context of the human body and perhaps more importantly in the context of patient care.

The forces that have and continue to shape the development and direction of this unique undergraduate medical educational experience have come from a variety of sources. Many are internal to the medical school, and many have been supported by external bodies concerned that the medical curriculum deliver its promise of improved healthcare. Change has come as a result of social, cultural, political and economic forces universal to all countries, organizations and governments. Arguably, the undergraduate curriculum is influenced by all, but often unable to control many.

Perhaps the most consequential individual force shaping medical education in general and the undergraduate curriculum specifically was the 1910 report entitled *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching*. This report, written by Abraham Flexner commonly referred to as the Flexner Report, summarized his findings in visits to 155 medical schools in Canada and the United States in 1909 ([Pritchett & Flexner, 1910](#)). Suffice to say, the recommendations of the original report published in 1910 had an enormous impact on bringing medical education into the university scientific setting, establishing standards for medical curricula, and medical education in general. Perhaps the single greatest impact on undergraduate medical education has come from the following quote from the Flexner Report:



"For purposes of convenience, the medical curriculum may be divided into two parts, according as the work is carried on mainly in laboratories or mainly in the hospital. But the distinction is only superficial, for in the hospital is itself, in the fullest sense Laboratory. In general, the four year curriculum falls into two fairly equal sections: The first two years are devoted to laboratory sciences and the last to clinical work."

[Pritchett & Flexner \(1910\)](#)

Although Flexner clearly believed that the sciences of the first 2 years were critical to advances in clinical care, the long-term impact on undergraduate medical education worldwide has led in large part to the most prevalent model of medical education. That is, 2 years of basic science followed by 2 years of clinical training and education in hospital. While this divide has been eased over the past 2 decades with clinical skills training and work with patients starting at the beginning of medical school, there is still more of an artificial divide than most desire. Even in countries with 5- and 6-year programmes, the divide between the basic science and clinical experience, even with

early clinical skill training, can be profound. The fact that the new Carnegie Foundation Report of 2010 calls for greater integration of the basic science and clinical experiences stands as evidence to this fact as do other recommendations similar to those of the 1910 report ([Irby et al., 2010](#)). A similar call for greater integration can be found in the General Medical Council's *Tomorrow's Doctors. Recommendations on Undergraduate Medical Education* ([1993](#)).

Another factor shaping undergraduate medical education has been the emergence of research in medical education based upon a rapid expansion of medical and scientific knowledge, changes in the standards of accrediting bodies worldwide, and an increase in demands for accountability from the public. Summarizing three decades of medical education research Norman notes, *"Perhaps the most important evidence of progress in the discipline is that we are now more likely than before to demand evidence to guide educational decision making—as a change in educational culture"* ([Norman, 2002](#)). In specific terms, the major impacts from medical education research and thus the development and delivery of the undergraduate curriculum have been:

- a better understanding of how medical expertise is acquired
- development and research in problem-based learning
- improved assessment methods ([Norman, 2002](#))

Concomitant with this, and as part of emerging medical education research, has been the development of cognitive science research. Modern computer and imaging technology have led to the ability to better understand the mind and how it functions to process information. It is generally understood that cognitive science is an interdisciplinary approach involving the fields of psychology, philosophy, linguistics, anthropology, artificial intelligence and neuroscience ([Miller, 2003](#)). For medical education, this has meant new understanding of the human learning process. The impact of the research in cognitive science upon the undergraduate curriculum will be discussed in greater detail later.

Another force that has influenced the undergraduate curriculum is the nature of the healthcare system in a given country or region, and the nature of medical practice in that system. Imagine a system in which primary healthcare was widely distributed, provided universally to all citizens, and one in which physicians and healthcare providers received the same remuneration regardless of a patient's gender, age, ethnicity or economic status. Imagine that the volume of patients seen in a given day or week was not the determinant of remuneration. Such systems would welcome medical students as learners and physicians would have an adequate amount of time to spend with them and their patients. Such a system may exist today, but a more common system is one in which the distribution of primary care physicians and primary healthcare providers does not match the needs of the population.

More commonly, healthcare is disease oriented rather than prevention and wellness centred, isolationism between and among healthcare providers is common, and large disparities exist between segments of the population. In this model physicians and healthcare providers find themselves pressured to see more and more patients and find students placed in their practices a detriment to their productivity and incomes ([Frenk](#)

[et al., 2010](#)). These are not environments into which medical students should be placed as these curricular experiences become the 'model' for care and perpetuate the current system. In summary, the context in which medical education occurs, nature of the healthcare system, cultural values, the rapid change of the nature of healthcare and physician role models all impact the undergraduate curriculum and the students touched by them. As noted earlier, advances in medical education research and the cognitive sciences have also had a large impact on the undergraduate medical curriculum.

In a landmark publication, [Papa and Harasym \(1999\)](#) describe stages of medical schools in North America from a cognitive sciences perspective. They describe five curricular models by year and era of initiation, portions of which exist in medical schools to this day, worldwide. They are:

- Apprenticeship Model (1765)
- Discipline-based Model (1871)
- Organ-System-based Model (1951)
- Problem-based Model (1971)
- Clinical Presentation-based Model (1991)

It can be argued that the discipline-based model was heavily reinforced by interpretation of the Flexner Report of 1910 and that the relative speed of curricular reform between the 1960s and the 1990s was the result of change in our knowledge from the emerging research in medical education heavily influenced by cognitive science research. Each of these models exhibits strengths and weaknesses, and today it is common for undergraduate medical curricula to reflect some of each in a mixed model attempting to draw upon the strengths of each and to compensate for their shortcomings.

Perhaps the most impactful research finding from cognitive research studies related specifically to medical knowledge expertise and diagnostic reasoning. It had been argued that what students learned in a specific problem in a problem-based case would then generalize to different medical problems. The work of [Elstein et al. \(1978\)](#) demonstrated that problem solving and diagnostic skills were problem specific and not generalizable. These findings and others led to the development of the clinical presentation model and the realization that medical students would need experience with a large range of specific medical problems to eventually become competent physicians. The development of early clinical experiences for medical students in the curriculum, the use of simulated patients and simulation devices can all be viewed as mechanisms to begin the process of student exposure to a broad range of medical problems. These experiences provide students with foundational experiences that will assist in the transition to postgraduate education and training.

In many countries, the number and distribution of healthcare providers is a significant problem. In the same way that our understanding of the nature of cognitive learning has changed, the context in which undergraduate medical education occurs has been critically examined. It has been shown that the distribution of primary care physicians into rural area, for instance, is associated with a rural upbringing, positive

educational experiences in rural areas as undergraduate students and postgraduate training in rural areas ([Strasser et al., 2016](#)).



Tip

The directions of the undergraduate medical curriculum have been shaped by external influences, internal influences, and advances in understanding the learning process through research in the cognitive sciences.

Critical components of the undergraduate medical education programme as they relate to the continuum of medical education

For the undergraduate curriculum to be both effective and meaningful as a component of the continuum of medical education, there are a number of concepts that should be considered in planning the curriculum ([General Medical Council, 2015](#); [Liaison Committee on Medical Education, 2015](#)). Among these are:

1. A statement of the mission, vision and goals of the medical school.
2. Scientific content that is current and appropriate to the mission and includes the major concepts of basic and clinical sciences.
3. A curricular model that supports the learning required of each student.
4. A system of curriculum management that provides centralized overview of curriculum delivery.
5. Programmes in place that provide for the assessment of student performance and evaluation of the programme.
6. A system that assures faculty are of sufficient quality and preparation for their roles.
7. Adequate financial and physical resource to deliver the curriculum.
8. An educational environment that is safe for students and conducive to learning.

1. Mission, vision and goals

A statement of the medical school's mission serves as a guide to the direction an institution plans to follow in implementing its curriculum. The goals outlined in the mission should also include the concepts of preparing students for whatever medical practice or postgraduate education and training they may select. A mission should reflect the need for a sound basis in science, and the application of these sciences to clinical practice. As such, the mission ultimately should guide the development of overarching programme objectives that serve as a framework for the design and development of all teaching and learning activities. The overarching programme objectives in turn guide the development of course goals and objectives and eventually specific learning activities and their outcome measures/assessment. This 'cascade' effect is illustrated in [Fig. 3.1](#).

2. Scientific curriculum content

It is important that the curriculum of the medical school include the basic biomedical, clinical and social sciences content and concepts contributing to the modern and appropriate practice of medicine today. It also should include opportunities to develop the competencies graduates will need to be successful in the next stage of training along the continuum of medical

education. This includes not only the acquisition of traditional basic and medical sciences knowledge, such as biochemistry, physiology, microbiology, pharmacology, immunology and pathology to name a few, but newer concepts as well. Among these newer concepts are wellness, translational research and the behavioural and social sciences. The involvement of qualified faculty in developing the curriculum content is essential. It is advisable to use references from national and international organizations, such as the Association for the Study of Medical Education (ASME), the Association of American Medical Colleges (AAMC), and the Association of Faculties of Medicine in Canada (AFMC), in determining content for the undergraduate curriculum. Modern curricula should include concepts in medical ethics, population health, and interpersonal communication skills, all of which are required of a learner engaged in postgraduate learning activities. These concepts are best described and understood in the context of the culture and legal system in which the course is taught and in which medicine will be practiced. The inclusion of this specific curricular content requires faculty leadership and collaboration as, in the end, it is the role of the institutional faculty to determine curricular content and to agree on its sequencing and delivery.

3. A curricular model that supports the learning required of each student

Any curricular model a school chooses must support the mission of the school. For example, if the mission articulates the need for access to high quality healthcare for all populations the school serves, the curriculum must support the provision of learning activities in which students can learn medicine in a context that serves the mission.

In developing an undergraduate medical education curriculum, medical educators must take into account the unusually large volume of medical knowledge, clinical and communication skills required of a medical student, and the need for each student to retain the knowledge and skills as they transition to the next stage along the continuum of medical education. Although far beyond the scope of this chapter, suffice it to say, medical educators must consider basic learning theories as they design and develop learning activities to meet the learning needs/preferences of the medical students. Typically, these activities would include small- and large-group learning, simulation – to include the use of standardized patients, journal clubs, laboratory experiences and self-directed learning opportunities.

4. Managing the curriculum

Central management and control of the undergraduate curriculum is essential for ensuring that the goals of the curriculum and its contents are aligned to the mission. The ultimate responsibility for delivery of a quality curriculum lies with the chief academic officer, usually the dean. Many medical colleges have a vice dean to whom oversight of the curriculum is delegated and a curriculum committee made up of faculty representatives

who report to the vice dean. Historically, medical curriculum committees have been composed of departmentally based representatives whose primary task was to make sure that their department's courses were included. This is the model that existed in the era of the discipline-based curriculum.

More recently, in the era of the problem-based, organ-systems curriculum and the clinical presentation-based model, new structures have arisen to facilitate the integration of multiple and inter-related concepts and content. This has included providing physician input into planning courses in the first years of the curriculum and serving as co-course directors along with their counterparts from the basic sciences. As co-course directors, initial clinically relevant case problems are developed and often presented as a team. The presentation of the clinical case and its related diagnostic reasoning provides a 'scaffold' for better understanding the concepts presented in the organ-systems course ([Ambrose, 2010](#)). This model is based on course development teams organized around common themes or organ systems. These groups of faculty from different disciplines represent the clinical and basic science content areas that are focused on the integration of content. These groups are ultimately responsible to the curriculum committee. Themes or threads of curriculum may also be used to provide integration of content around common presenting problems or concepts.

Ensuring the horizontal and vertical integration of content and learning activities is an important concept in the curriculum management process. In this case, 'integrate' is defined as *"to form, coordinate or blend into a functioning or unified whole"* ([Merriam-Webster's Collegiate Dictionary, 2003](#)). In a curricular sense, there are two types of integration. Vertical integration occurs between the content, skills, behaviours and attitudes for those experiences or courses occurring at the same time or between years of the curriculum. Horizontal integration is the integration of content, skills, behaviours and attitudes between course and experiences that proceed or follow.

Perhaps the most powerful tool for insuring that horizontal and vertical integration occurs is through the use of a curriculum map. A curriculum map is built upon the concept of the cascade effect described in [Fig. 3.1](#). It need not require an elaborate electronic system as there are workable models that can be built using a searchable spreadsheet. The key is in connecting the components of the cascade in hierarchical fashion from the mission to goals to objective to content and to assessment methods.

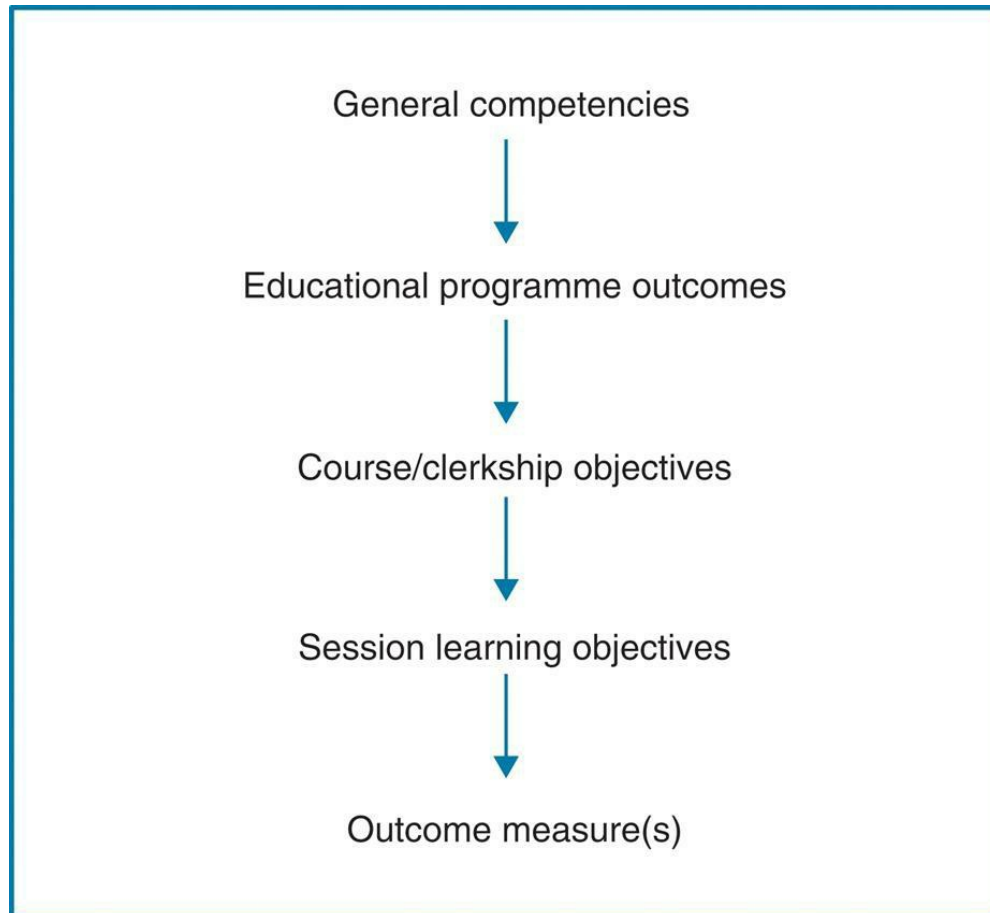


FIG. 3.1 Programme objectives cascade here.



Tip

Central management of the curriculum is fundamental to ensuring horizontal and vertical integration of course content and sequencing of learning experiences. Mapping curricular objectives to programme goals and outcomes is a critical tool to achieve these tasks.

5. Assessment of student performance and programme evaluation

A number of factors in addition to those mentioned earlier contribute to the creation of a quality curriculum. Among these are systems in place to assess student progress, to evaluate the faculty performance and to evaluate the programme in general. This system is often referred to as continuous quality improvement. Data of student performance should be comprehensive and measure not only acquisition of content knowledge but skills, attitudes and behaviours reflected in the programme objectives. The methods used to measure performance must be appropriate to the

learning context. Information on student progress should be collected systematically and reported within a reasonable time frame to allow learners to correct errors. It is highly desirable that students receive formative feedback, that is, feedback on their performance that is provided during the learning experience and well before a final mark or score is recorded. This gives the student a sense of how they are progressing and also allows them to improve before a summative grade or mark is recorded (Wood, 2010).

Student feedback on the specific learning experience, course or faculty instructor is another source of information on the curriculum. When systematically and anonymously collected, feedback from students is valid and useful in understanding their perspective on the curriculum experience. When student numbers are small, such as in some clinical rotations or seminars, data should be collected over time and bunched to assure anonymity.

Annual reviews of the curriculum by the curriculum committee and any other committees engaged in curriculum oversight are important sources of information. At these review sessions all data relevant to the curriculum should be available for review. Discussion should include student assessments with passing and failing rates, student feedback on their experiences, course director and faculty comments. Data comparing courses across the criterion should be available as well.

6. Preparation of faculty for their roles as teachers

To support the quality of teaching and learning in the curriculum, there must be a system in place that ensures all faculty teaching and assessing students have proper credentials and training for the task. These will vary from school to school, but the qualifications should be published and made available through the normal means that applicants use to make applications. Usually this includes type of degree, areas of specialty, training and levels of experience and a copy of their resume or curriculum vitae. Letters of reference are usually sought for final candidates. It is common to ask final applicants to interview on sight and to provide a presentation of their educational and research area of interest. Review of faculty candidates is most often accomplished by a faculty committee of peers capable of judging the academic merit and eligibility for rank upon appointment. Engagement of faculty in this process is another method to ensure quality of the educational programme and decreases the potential of bias in the selection process.

7. Financial and physical resources

The availability of resources both financial and physical varies widely between medical schools around the world. Each institution must ultimately decide what the appropriate levels of financing are and the types of facilities that best fit their mission and learning opportunities designed for the curriculum.

8. Safe learning environment

Assuring students and faculty with a safe environment in which to teach and learn is not only essential to their wellbeing but also for their ability to be successful. For students this means the ability to comment on their experiences and their concerns without fear of reprisal. And because it is called a medical school, it should be expected that students will make mistakes and errors in judgement. The process towards becoming a healthcare professional is a difficult one at best, and students need to be assured that there are processes in place to protect them and their patients. Anonymity in evaluating learning experience is one mechanism, as is the ability to review their records and to appeal actions, such as grades and reprimands that they feel unfair. A student handbook or similar document should be available to students, faculty and staff, which states these protections.

Summary

The undergraduate medical education curriculum is unique not only as a medical student's first full-time exposure to medicine but also as a bridge between those experiences before medical school and the specialty training that may follow. This continuum of medical education culminating in medical practice and lifelong learning is a journey that is not always as smooth as it could be. Given the enormous amount to be learned by students and the forces constantly affecting the curriculum, it is the responsibility of medical educators to ease the transitions along this continuum. This can best be done by continued vigilance in understanding where students have come from before medical school, where they are headed beyond undergraduate education and training, and always in keeping with the mission, vision and educational goals of the institution. Always start with the end in mind.

References

- Ambrose, 2010 Ambrose S. How learning works. In: Mayer R, ed. *What kinds of feedback enhance learning?*. Hoboken: Jossey Boss; 2010;121–152.
- Aristotle Aristotle, *De anima* 429b29–430a1.
- Corrigan et al., 2010 Corrigan O, Ellis K, Bleakley A, et al. Quality in medical education. In: Swanick T, ed. *Understanding medical education*. London: Wiley-Blackwell; 2010;379–391.
- Elstein et al., 1978 Elstein AS, Shulman LS, Sprafka SA. *Medical problem solving: an analysis of clinical reasoning* Cambridge, Massachusetts: Harvard University Press; 1978.
- Frenk et al., 2010 Frenk J, Chen L, Bhutta ZA, et al. Health professions for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923–1958.
- General Medical Council, 1993 General Medical Council. *Tomorrow's doctors Recommendations on undergraduate medical education* London: GMC; 1993.
- General Medical Council, 2015 General Medical Council. *Promoting excellence: standards for medical education and training* London: GMC; 2015.
- Irby et al., 2010 Irby DM, Ivens M, O'Brien B. Call for reform of medical education by the Carnegie Foundation for the advancement of teaching: 1910 and 2010. *Academic Medicine*. 2010;85(2):220–227.
- Kruse, 2013 Kruse J. Social accountability across the continuum of medical education. *Family Medicine*. 2013;45(5):208–211.
- Liaison Committee on Medical Education, 2015 Liaison Committee on Medical Education. *Functions and structure of a medical school* Washington, D.C.: Liaison Committee on Medical Education; 2015.
- McCrorie, 2010 McCrorie P. Teaching and leading small groups. In: Swanick T, ed. *Understanding medical education*. London: Wiley-Blackwell; 2010;124–138.
- Merriam-Webster's Collegiate Dictionary, 2003 Merriam-Webster's *Collegiate Dictionary*, 11th ed. (2003). Springfield, Massachusetts: Merriam Webster, p. 650.
- Miller, 2003 Miller GA. The cognitive revolution. *Trends in Cognitive Sciences*. 2003;7(3):141–144.
- Norman, 2002 Norman GR. Research in medical education: three decades

- of programs. *British Medical Journal Online*. 2002;324(7353):1560–1562.
- [Papa and Harasym, 1999](#) Papa FJ, Harasym PH. Medical curriculum reform in North America, 1765 to the present: a cognitive science perspective. *Academic Medicine*. 1999;74(2):154–164.
- [Petersdorf, 1994](#) Petersdorf RG. Medical curriculum training, and the continuum of medical education. *Journal of the Royal Society of Medicine*. 1994;87(Suppl. 1 22):41–49.
- Pritchett and Flexner, 1910 Pritchett H, Flexner A. *Medical Education in the United States and Canada: A Report for the Carnegie Foundation for the Advancement of Teaching* New York: The Carnegie Foundation; 1910;57–70.
- [Strasser et al., 2016](#) Strasser R, Couper I, Wynn-Jones J, et al. Education for rural practice in rural practice. *Education for Primary Care*. 2016;27.
- [Wood, 2010](#) Wood T. Formative assessment. In: Swanich T, ed. *Understanding medical education*. London: Blackwell; 2010;259–269.

Postgraduate Medical Education

A 'Pipeline' to Competence

Linda Snell, Jason R Frank and Yousef Marwan

Trends

- In addition to being learners, postgraduate trainees fill critical roles in healthcare systems, for example, as teachers, leaders, scholars and advocates.
- During residency learning occurs primarily in the workplace: this requires specific approaches for teaching and assessment.
- Outcome-based paradigms of residency education are evolving models where competency frameworks form the basis of curriculum, learning and assessment.
- Transitions into, within and out of postgraduate training are receiving more attention within residency curricula.
- Training outside large academic health centres is becoming more common and provides diverse opportunities and perspectives.
- Globalization has encouraged the international mobility of physicians and has influenced postgraduate medical education (PGME) training standards.

Key concepts

- Postgraduate medical education (PGME): stage of medical training between the end of medical school and the time a physician enters independent practice.
- Graduate medical education: phrase used for postgraduate medical education in the United States.
- Resident: a postgraduate medical trainee. Around the world these individuals have also been called junior doctors, house officers, registrars, (post)graduate trainees or clinical fellows.
- Learning environment: includes the *“social interactions, organizational cultures and structures, and physical and virtual spaces that surround and shape participants’ experiences, perceptions and learning”* (Macy 2018), and comprises learning experiences that *“occur in classroom, online, simulation and clinical settings”* (Gruppen et al., 2018).
- Certification: acknowledgment of completion of requirements for recognition as a specialist, usually by a specialty association or national organization.
- Independent practice: the ability to practice medicine autonomously and safely, without supervision; this is the ultimate goal of PGME programmes.

Introduction

PGME is the period of medical training between the completion of medical school and the time a physician is deemed competent for independent practice. During this period of 1 to 7 or more years, young doctors improve knowledge, hone skills, cultivate behaviours and develop professional attitudes that prepare them for a career of autonomous practice. *“Although professional socialization starts in medical school, professional values and behaviours are internalized and a physician’s identity is formed to a great extent during residency”* (Snell, 2016). This chapter provides a brief overview of PGME today and addresses various models and organizational structures of PGME; the key elements of PGME programmes and curricula; common strategies for teaching, learning and assessment; the roles of programme directors, programme administrators and teachers; the roles residents perform in a healthcare system; how the quality of residency education is assured, and a resident perspective on PGME.



“Residency is when ‘doctors come of professional age – acquiring the knowledge and skills of their specialties or subspecialties, forming professional identities, and developing habits, behaviors, attitudes, and values that last a professional lifetime’.”

Ludmerer (2015)

History and evolution. Until the late 19th century a medical school graduate usually went directly into independent practice. Those graduates wishing further specialization undertook informal, often short training periods with an established specialist, in the form of an apprenticeship. Drs. William Osler and William Halstead established the first formal residency programmes at Johns Hopkins Hospital in the early 1900s. These residencies were hospital-based, where residents would live (or ‘reside’, hence the term residency) in hospital while learning during patient care. They had minimal compensation apart from housing and food. In the early 20th century residencies were formally developed for the principal specialties; however, a residency was not required for primary care and few medical school graduates going into general practice did postgraduate training. This model continued up to the middle of the 20th century, after which an increasing number of graduates undertook residency training. Worldwide, by the end of the 20th century, very few newly graduated doctors went directly from medical school into independent unsupervised medical practice. In many countries, regulatory and licensing bodies began requiring one or more years of postgraduate training for medical licensure and specialty certification (Ludmerer, 2015).

Key elements of postgraduate medical education programmes

Models. There is great variability in the organization of postgraduate medical training around the world. Some countries have structured programmes, including planned expert supervision, regular theoretical teaching, research experience, systematic assessment, and evaluation of the training programmes. In other countries, the process of postgraduate medical education is based on practical clinical training (WFME, 2015) and time spent learning in the workplace. There are, however, some basic models, as shown in Box 4.1. These curricular models are quite diverse, and the required length of training is often variable. To attain the equivalent qualifications for practice, depending on the country or constituency, training may range from 1 to 10 years following medical school.

Box 4.1

Models of postgraduate medical education

- Entry from medical school into 2 to 8 years specialist training
- One to 2 internship or foundation years after medical school, followed by specialist training of 3 to 10+ years
- Accumulating varied clinical experiences over a variable time (Nordic countries)
- Fixed-term specialist training, a fixed time during which the resident accrues experience
- Competency-based models, such as those being implemented in Canada, the Netherlands, United States
- One-to 2-year internship as a stand-alone entity before practice
- Postgraduate medical education for minority of medical school graduates, the majority into general practice directly from medical school

Many countries offer further focused clinical placements (sometimes called ‘fellowships’) following postgraduate certification to allow subspecialization or development in a specific clinical area or procedure; in other places, this learning is considered part of continuing professional development programmes and not part of postgraduate education. There are also opportunities for concentration on nonclinical topics within training. These vary greatly around the world and include areas, such as basic, clinical or epidemiologic research, global health, medical education and healthcare leadership and management.

Programme oversight. Universities, hospitals (academic or community, urban or rural), clinics, communities or private organizations may play a role in residency programme development and management. Jurisdictions vary with regards to who sets

PGME curricula, and how they are structured. At one end of a spectrum, the 'curriculum' is essentially the scope of practice of the individual supervisor or group of supervising clinicians. In this scenario, trainees' workplace learning allows them to acquire this same scope, akin to a vocational apprenticeship. Individual institutions often design a local curriculum that is semi-structured, with planned and sequenced learning combined with ad hoc learning during patient care. Further along, this curriculum planning spectrum are the national or international standards set by various institutions, such as the Royal Colleges, World Federation of Medical Education (WFME, 2015) or specialty boards around the world. Finally, some specialty societies build their own core curricula for countries or institutions to implement: examples are the American Congress of Obstetricians and Gynecologists, European Society for Emergency Medicine, some specialties in Brazil. These are often mixed programmes with a minimum length requirement; experience is gained in different areas and varied clinical settings. Regardless of the model, clinical experiences with increasing autonomy and increasing responsibility for patient care (sometimes known as rotations, placements or terms) is the sine qua non of PGME.

Local programme governance. Most accreditation or regulatory bodies have standards for the organization and governance of individual residency programmes. Although each system varies, such standards serve the purpose of ensuring quality training at all PGME locations. Essential PGME requirements typically include a most responsible training director (also known as programme director), a residency programme committee, a method for recruiting or selecting trainees, a curriculum of clinical and nonclinical learning activities, a system of assessment and a reporting and accountability structure. Many programmes will also have a competence committee, a selection committee or a curriculum committee.

Selection and admission. Residency programmes have a mandate to produce a physician workforce that meets the needs of society (Bandiera et al., 2015). Most programmes select trainees based on their performance as a medical student, academic records, personal statements, reference letters, interviews, tests of personality or emotional intelligence, or tests of knowledge, situational judgement or skills (Patterson et al., 2015). A newer form of interview is the multiple mini-interview (MMI), where candidates undertake an objective structured clinical examination-like series of short interviews, like a multiple station examination, addressing specific tasks, attributes or competencies (Hofmeister et al., 2008). One commonly used selection method is a standardized national 'match', where trainees rank their choice of programmes, and potential programmes rate and rank all applicants. An electronic match is likely to result in a fair, objective and transparent process of assigning trainees to programmes. In some countries, an individual medical graduate must search for and apply to many posts. The acceptance decision may be made by the department chief, clinical unit director or the residency programme director.

Programme directors. Residency programme directors (PDs) are usually faculty members providing leadership for residency programmes. They are responsible for the overall organization, conduct, and accountability of their residency programmes, and generally report to department and/or university leadership. The overall mandate of the

PD is to ensure that residents receive the best possible training and education and that the standards of the accrediting and regulatory bodies are maintained. Responsibilities of the PD often include curriculum planning, implementation and monitoring; administration of the programme office, staff; managing programme finances and resources; establishing and leading committees; recruitment and selection of residents; administering a system of assessment; supervision, support and mentorship of residents; dealing with resident wellbeing; and teaching and role modelling. A good PD will have strong leadership, communication and interpersonal skills; knowledge of the principles of adult learning and postgraduate medical education, including education planning and delivery skills; capability to conduct ongoing quality programme review and the ability to manage conflicts and to advocate for residents and PGME.

Programme coordinators. These individuals, also known as *programme administrators*, manage day-to-day operation of the programme; they arrange meetings, collect resident and faculty evaluations, schedule interviews, update the residency website and organize rotation schedules. Their role, however, is not limited to coordination of tasks and resources. They are required to be aware of the residency training policies of the institution, advocate for change and effectively implement strategies to manage change when needed; assist in programme accreditation and incorporate quality improvement measures; and effectively communicate with residents, PDs and other members of the residency programme. It is therefore essential that these individuals have set of skills that enables them to work independently and within teams to meet residency programmes requirements. Institutions are also encouraged to train them for the job and support their participation in professional development activities ([Stuckelman et al., 2017](#)).

Settings, clinical placements. Training sites vary between specialties and across countries, ranging from rural placements, community clinics, or practitioners' outpatient offices to multispecialty high-acuity tertiary care hospitals. There are educational trade-offs between a one-to-one relationship with a single supervisor, and a large academic health centre with a critical mass of trainees and supervisors and a wide range of clinical exposure, but less personal attention and possibly less opportunity for hands-on practice. Exposure to settings outside of major academic centres influences some residents to choose to work in these often-underserved areas in their future practice. The setting for training goes beyond education and may affect clinical service needs, a resident's choice of eventual practice location, health human resource planning and funding and policy issues. Whatever the setting, the resident learns by being immersed in clinical practice.

The learning environment is more than just the physical 'place': it includes social interactions, the organizational cultures and virtual spaces that shape learners' experiences ([Macy, 2018](#)). The hidden curriculum refers to the set of implicit messages about values, norms, and attitudes that learners infer from the behaviour of individual role models, as well as from group dynamics, processes, rituals, and structures ([Hafferty, 1998](#)). The learning environment can have a strong positive or detrimental effect on a resident's learning and on their identity formation. The combination of allowing the resident autonomy while maintaining enough supervision for patient

safety, providing opportunities to apply what they have learned and make decisions for care, and expecting the resident to take responsibility and be accountable for patient care reinforces resident performance and confidence ([Sawatsky et al., 2020](#)).

Teachers, clinical supervisors. Residents may be assigned to an individual supervisor or to a clinical service where there may be many overseeing clinicians. These teachers often have a powerful influence on trainees: a physician's performance throughout their career is linked to where they trained and who they trained under ([Asch et al., 2009](#)). Most clinical supervisors are practicing physicians who are experts in an area of clinical medicine, but they do not necessarily have any training or expertise in teaching, assessment or resident supervision. Basic education skills needed by clinical teachers include bedside teaching methods, coaching, role modelling, guided reflection, mentoring, providing feedback, work-based assessment, and using tools for observation, feedback and assessment. As well, teaching in varying contexts, such as on ward rounds, in the operating theatre, or in a busy outpatient clinic are important skills for clinical supervisors. Faculty or staff development programmes can address many of the needed skills, but until recently, attending these programmes was not mandatory and demonstrating mastery and using these skills was not recognized or rewarded. However, over the past decade there has been an increased professionalization of the field, with mandatory teaching skills training and certification or accreditation of clinical supervisors in some constituencies. Faculty development is discussed in more detail in another chapter in this volume.

Roles of residents. Postgraduate medical trainees are unique in healthcare systems in that they are simultaneously both learners and workers, which may cause some confusion. Residents perform a major part of the patient care in teaching hospitals and other healthcare institutions, with a variable amount of supervision depending on their level and the context. In most cases, they are paid as practicing doctors and have stipulated patient care tasks. Without postgraduate trainees in this role, most academic health institutions around the world would not be able to provide their current level of care.



"Teaching by residents is different from and likely complementary to faculty teaching...Residents tend to teach different things in a different way at different times."

[Snell \(2011\)](#)

Residents may also have roles besides patient care ([Box 4.2](#)). Perhaps the most prominent is teaching their junior trainees and medical students. Medical students learn about one-third of their knowledge and skills from residents and residents may spend up to one-fourth of their work time teaching ([Snell, 2011](#)). Many residents, particularly in their senior years, are also significantly involved in medical research of many types; examples include basic, applied, clinical, translational research and studies in areas, such as medical education, epidemiology and population health, health services, and the field of quality and safety. Residents also have major roles as leaders and managers, running teams of more junior trainees, contributing to the organizations in which they

work through serving on committees, and effecting change in education and clinical care through their efforts.

Box 4.2

Roles of residents

| | |
|-------------------------------------|------------------------------------|
| Learner | Leader |
| Clinical practitioner | Team member |
| Teacher | Health advocate |
| Assessor | Innovator |
| Mentor | Activist |
| Role model Researcher Administrator | Contributor to quality improvement |

Education components of postgraduate medical education programmes

Curricular models. For most of the 20th century, postgraduate education was based on residents rotating through various clinical settings for a defined period of time. Clinical experience was accepted as the only requirement to attain clinical competence. Although many systems around the world still use this model, recently there has been an increasing interest in outcome-based or competency-based learning, and several countries now use competency frameworks to design their postgraduate medical training. A number of medical organizations across the globe have defined competencies and outcomes for health professionals. Examples of these frameworks are CanMEDS 2015 in Canada ([Frank et al., 2015](#)), Accreditation Council for Graduate Medical Education competencies in United States, The Scottish Doctor, and the Royal Australasian College of Physicians in Australia and New Zealand competencies. These frameworks describe competencies in addition to 'medical expert', for example communication skills, interprofessional collaboration, leadership and management, teaching, self-directed learning and professionalism. These well-defined competencies inform the organization of curricular structure, the choice of learning methods and the use of assessment tools that are consistent with the desired results. They also underlie decisions on when competence is attained and advancement to the next training stage ([Frank et al., 2010](#)) and can address important transitions, such as the curricular content needed late in training to prepare for fully autonomous practice. Competency-based programmes allow trainees to take more responsibility for their own learning process and may allow flexibility so that education can be individualized to address learner needs or local context.



"As educators we must take the lead in defining and studying the outcomes that result from this paradigm shift to competency-based education with the same rigor we use in basic science laboratories and randomized clinical trials."

Carraccio et al. (2002)

Teaching and Learning. In postgraduate education, much of the learning occurs in a workplace setting while the resident is concurrently caring for a patient or performing other clinical tasks. Postgraduate medical education is an immersive experience in which applied learning is expected to happen in an authentic setting by exposing the trainee to the work they will actually do in the future. The resident's clinical supervisors may coach, direct and teach informally or may use tools to frame their observations and feedback. In this context, experiences that are not included in the formal curriculum play an important role in learning. 'Informal learning' or the informal curriculum is what is learned outside the formal teaching; it is opportunistic and unconstructed. Trainees also learn from other nonphysician members of the healthcare team. Role

modelling is an important educational strategy that occurs at every level of education but is particularly important in PGME. In work-based learning, it acts as an important method to transmit skills and behaviours and help the resident develop a professional identity. As the trainee progresses along the educational path, learning and care activities evolve to approximate the tasks of a practicing doctor, with an increasing level of autonomy provided to trainees. Finding the right balance between patient care and learning has been a challenge in some settings.

As well as work-based learning, resident education may occur in nonclinical settings through case-based learning activities, workshops, academic half-days, lectures and seminars (including the flipped classroom), journal clubs, online learning and in simulation contexts. In many contexts, there is an attempt to balance clinically based education and patient care with protected study time and formal education activities. There are great differences around the world – some programmes have fixed times for formal learning during a week or month, others collect credit points during a residency programme, and still others have no mandatory formal teaching or study time. According to the WFME Postgraduate Medical Education Global Standards, as well as clinical work the programme provider(s) must include relevant theory of basic biomedical, clinical, behavioural and social sciences; clinical decision making; communication skills; medical ethics; public health; medical jurisprudence; managerial disciplines and as well must organize the educational programme with appropriate attention to patient safety (WFME, 2015). Residents may also attend specialty conferences and congresses, in this way preparing for their future continuing professional development.



“Postgraduate medical education is a unique educational environment, with its emphasis on work-based learning, clinical supervision as a predominant method of training, performance-based assessment, and the challenge of simultaneously delivering education, training and service.”

Steinert (2011)

Assessment. As part of work-based learning, residents receive ongoing formative and summative assessment. Some common assessment strategies are listed in [Box 4.3](#). Formative assessment or feedback is critical to the development of knowledge, skills and expertise in all competencies. Residents are assessed through direct observation of their interactions with patients; the quality of their case presentations, written work or clinical outcomes may also be assessed. They may be assessed by their clinical supervisors, more senior residents, other health professionals, their students or patients.

Box 4.3

Examples of strategies for assessment in the workplace

- Direct observation of resident performance
- Tools to structure observation and feedback of clinical performance
- (compare with, OScore, MiniCEX)
- Review of work products (e.g., clinical documents that form part of the medical record)
- Multisource feedback (e.g., 360-degree assessments)
- Learning portfolios (e.g., records of performance achievements)
- Logbooks (e.g., records of activities or procedures)
- Encounter cards (e.g., daily shift assessment card)

In most PGME systems around the world, there are formal, summative, external assessments that serve as gateways to future career stages. As opposed to the formative feedback or summative decisions within the programme, these often involve a third-party institution or process to assess competence at a key stage of training. The most common of these processes are licensing and certification examinations at the end of training. These tend to focus heavily on knowledge and are usually designed as written tests, with or without a component of a structured oral exam. Their purpose is to provide an independent summative decision on competence to proceed to the next career stage (e.g., certification in a discipline before independent practice) or to obtain a license to practice in a jurisdiction. Occasionally, they are also used for programme evaluation purposes, comparing learner performance between training institutions or sites. Nevertheless, when well designed, these exams are predictive of future performance ([Wenghofer et al., 2009](#)).

Quality of programmes. Factors indicating the quality of a PGME programme vary with perspective, and these have changed over time with the evolution of formal programmes and national standards. Quality PGME has at times involved markers, such as the number of trainees in a programme, the academic performance of incoming or outgoing residents, the research published by participants in a programme, the awards won by residents or teachers, the type of and stature of jobs that graduates obtain or the examination scores of trainees. These perspectives have evolved to provide a greater focus on good educational practices and programme outcomes in the form of graduate performance. Some of these markers of PGME quality are listed in [Box 4.4](#) ([Frank et al., 2020](#); [Taber et al., 2020](#)).

Box 4.4

Markers of quality postgraduate medical education found in various systems

- Presence of program mission and goals
- Complete sets of competencies to be achieved
- Evidence of a program blueprint, mapping learning goals, instructional methods

and assessment by activity

- Positive learning environment
- Effectiveness of teaching
- Learner scores on standardized testing
- Numbers of resident and faculty research publications
- Adequacy of resources for the program (e.g., financing, personnel, infrastructure, dedicated time, patients)
- Attention to resident wellbeing
- Graduate competence or performance
- Quality of patient care

Good education practice should also involve the CQI of PGME itself. The enterprise related to external programme evaluation of PGME institutions is called accreditation in most jurisdictions. Accreditation typically involves a third-party oversight or evaluation of the local resident education process, environment or outcomes. Often, but not always, this involves designated reviewers (or 'surveyors') visiting the programme and interviewing participants to create a report on local training as compare with preestablished standards. Accreditation can have both a formative and summative role in PGME systems, enhancing CQI and making decisions on the future viability of training programmes.

A resident perspective on postgraduate medical education

From a resident point of view, postgraduate residency training is a critical period in which physicians acquire knowledge and skills of their field of interest. During this period, residents strive to be independent and competent clinicians, however they face many challenges. One concern is that the way many residency programmes are designed facilitates gaining knowledge and skills but not necessarily in retaining them. For example, a junior-level surgical resident learns how to perform a set of basic surgical procedures by the end of a specific rotation, and then moves to other subspecialties. By the time this resident return to the same rotation at a senior level (perhaps several years later), they may struggle to perform the junior-level procedures when they are expected to be learning more complex skills. Therefore residency programmes should be designed to help residents retain their knowledge and skills, especially as programmes move towards competency-based education where competencies will be based on level of training. Another challenge of residents is integrating work and personal life. Although this has been studied in depth, and work hours regulations have been implemented in many jurisdictions, the resident's perspective of the real-life situation is different. Residents study, prepare presentations, do research, participate in journal clubs and do many other work-related activities after regular work hours. This limits the residents from enjoying personal interests, which can negatively affect their wellbeing. Finally, as clinical practice is not purely based on clinical knowledge and skills, residency programmes should invest in preparing their graduates to manage their future clinical practice, to ensure smooth transition from being a learner to an independent clinician.



"The years of internship and residency are sandwiched between medical school and a first job as a 'real doctor.' They are fundamental in shaping the way a physician thinks, works, and acts."

Drazen and Epstein (2002)

Summary

PGME has evolved and will continue to do so. Different curricular designs (such as competency-based medical education), new competency frameworks (such as CanMEDS, [Frank et al., 2015](#)), innovative selection techniques (such as the MMI), novel teaching methods and formats (such as simulation, flipped classrooms, coaching), contemporary assessment strategies (such as the O-Score), and the incorporation of current concepts (such as patient safety, e-health) all reflect the ongoing innovations developed by those active in PGME. These novel strategies need to be studied to ensure we are effectively creating the best physicians for the future.

PGME is essential to produce the practicing doctors needed in all countries. During residency, trainee physicians experience the majority of their learning and assessment in the workplace – the authentic clinical context. PGME is thus a critical phase of medical training where young doctors develop into mature independent practitioners capable of competently and safely caring for patients. Of all the advances in medical education over the last 100 years, PGME is perhaps the greatest gift of the profession to the world.

References

- Asch et al., 2009 Asch D, Nicholson S, Srinivas S, Herrin J, Epstein A. Evaluating obstetrical residency programmes using patient outcomes. *Journal of American Medical Association*. 2009;302(12):1277–1283.
- Bandiera et al., 2015 Bandiera G, Abrahams C, Mariela Ruetalo M, Hanson MD, Nickell L, Spadafora S. Identifying and promoting best practices in residency application and selection in a complex academic health network. *Academic Medicine*. 2015;90:1594–1601.
- Carraccio et al., 2002 Carraccio C, Wolfsthal S, Englander R, Ferentz K, Martin C. Shifting paradigms: from Flexner to competencies. *Academic Medicine*. 2002;77(5):361–367.
- Drazen and Epstein, 2002 Drazen J, Epstein A. Rethinking medical training — the critical work ahead. *New England Journal of Medicine*. 2002;347(16):1271–1272.
- Frank et al., 2010 Frank J, Snell L, Ten Cate O, et al. Competency-based medical education: theory to practice. *Medical Teacher*. 2010;32(8):638–645.
- Frank et al., 2015 Frank JR, Snell L, Sherbino J. *CanMEDS 2015 Competency Framework* Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.
- Frank et al., 2020 Frank J, Taber S, van Zanten M, et al. The Role of Accreditation in 21st Century Health Professions Education: Report of an International Consensus Group. *BMC Med Educ*. 2020;18 Available at: <https://doi.org/10.1186/s12909-020-02121-5>.
- Gruppen et al., 2018 Gruppen L, Irby D, Durning S, Maggio L. Interventions designed to improve the learning environment in the health professions: a scoping review. *AMEE MedEd Publish* 2018; <https://doi.org/10.15694/mep.2018.0000211.1>.
- Hafferty, 1998 Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. *Academic Medicine*. 1998;73:403–407.
- Hofmeister et al., 2008 Hofmeister M, Lockyer J, Crutcher R. The acceptability of the multiple mini interview for resident selection. *Family Medicine*. 2008;40(10):734–740.
- Ludmerer, 2015 Ludmerer KM. *Let me heal: the opportunity to preserve excellence in American medicine* Oxford: Oxford University Press; 2015.
- Macy, 2018 Macy Jr Josiah M. *Foundation. Improving environments for*

- learning in the health professions Recommendations from the Macy Foundation Conference* New York: Josiah Macy Jr. Foundation; 2018.
- Patterson et al., 2015 Patterson F, Knight A, Dowell J, et al. How effective are selection methods in medical education?. *Medical Education*. 2015;50:36–60.
- Sawatsky et al., 2020 Sawatsky AP, Santivasi WL, Nordhues HC, et al. Autonomy and professional identity formation in residency training: a qualitative study. *Medical Education*. 2020;54(7):161–627.
- Snell, 2011 Snell L. The resident as teacher: it's more than just about student learning. *Journal of Graduate Medical Education*. 2011;3(3):440–442.
- Snell, 2016 Snell L. Supporting professionalism and professional identity formation at the postgraduate level. In: Cruess R, Cruess S, Steinert Y, eds. *Teaching medical professionalism: supporting the development of a professional identity*. 2nd ed. New York: Cambridge University Press; 2016.
- Steinert, 2011 Steinert Y. Faculty development for postgraduate education – the road ahead. In: Members of the FMEC PG consortium, ed. *Future of medical Education in Canada*. 2011;3. Available at: https://www.afmc.ca/pdf/fmec/21_Steinert_Faculty%20Development Accessed 2019.
- Stuckelman et al., 2017 Stuckelman J, Zavatchen SE, Jones SA. The evolving role of the programme coordinator: five essential skills for the coordinator toolbox. *Academic Radiology*. 2017;24(6):725–729.
- Taber et al., 2020 Taber S, Akdemir N, Gorman L, et al. A “fit for purpose” framework for medical education accreditation system design. *BMC Med Educ*. 2020;20:306 Available at: <https://doi.org/10.1186/s12909-020-02122-4>.
- Wenghofer et al., 2009 Wenghofer E, Klass D, Abrahamowicz M, et al. Doctor's scores on national qualifying examinations predict quality of care in future practice. *Medical Education*. 2009;43(12):1166–1173.
- WFME: World Federation for Medical Education, 2015 WFME: World Federation for Medical Education. (2015). Postgraduate medical education WFME global standards for quality improvement, the 2015 revision. Available at: <http://wfme.org/standards/pgme>. Accessed 2020.

Continuing Professional Development

Samar Aboulsoud

Trends

- Harmonization of continuing professional development (CPD) systems is key to realize the movements of globalization and CPD without borders.
- Knowledge transfer and CPD are complementary and the two processes inform one another.
- Disruptive innovation and futuristic thinking are key players in CPD revolutionization.

Key concepts

- Performance improvement: an approach to the continuous study and improvement of the processes of providing healthcare services to meet the needs of patients and others ([Tufts Health Care Institute, 2002](#)).
- Knowledge transfer: the conveyance of knowledge from one place or person to another, resulting in the accumulation and assimilation of new knowledge ([Liyanage et al., 2009](#)). For healthcare providers (HCP), knowledge transfer goes one step further, looking not only at the transfer process, but also at the application of knowledge ([Patoine & Ebrahimi, 2012](#)).
- Substantial equivalency: a process that is based on the ability of each continuing medical education (CME)/continuous professional development (CPD) accreditation system to demonstrate a common set of values, principles, and metrics ([International Academy for CPD Accreditation](#)).
- Disruptive innovation: innovations that make products and services more accessible and affordable to potential clients. It is considered a major force of change in business, education, and healthcare ([Clayton Christensen Institute](#)).

Introduction



“By three methods we may learn wisdom: First, by reflection, which is noblest; second, by imitation, which is easiest; and third by experience, which is the bitterest.”

Confucius

Continuous professional development (CPD) refers to the ongoing development of multifaceted competences inherent in medical practice. Compared with continuing medical education (CME), it covers wider domains of professionalism needed for high-quality professional performance. CPD includes all activities that healthcare providers (HCP) undertake—both formal and informal—to maintain, update and enhance their knowledge, skills and attitudes in response to patients’ needs ([World Federation for Medical Education](#)). There are several definitions of CPD, most of which emphasize a planned process that focuses on the care provided and the patient outcomes through enhanced professional performance. CPD is also seen as a way of responding to the challenges raised in healthcare systems ([Cervero, 2001](#)). The dynamic field of healthcare has made it essential for HCP to be cognizant of the latest developments. CPD is recognized as an essential element of professional responsibility and accountability and is fundamental to the prosperity of healthcare ecosystems. Despite the growing attention to CPD and the increase in published research on the topic, grey areas and unanswered questions continue to exist, and further studies are required.

Continuing professional development: a professional and ethical obligation

An important concept that I would like to review at the beginning of this chapter is the fact that HCP participation in CPD is a professional and ethical obligation imperative to sustaining competence, improving performance, and demonstrating accountability to the public ([Chaudhry et al., 2012](#); [Lowe et al., 2009](#)). Furthermore, the World Federation of Medical Education highlighted the importance of engaging in CPD as a prerequisite for enhancing the quality of care, besides being a professional obligation. Medical ethics pertains to HCP behaviour and decision making ([Macnair, 1999](#)) and professional ethics is the commitment of physicians to educate themselves and others, as well as to self-regulation. In general, we should always remember that when we as physicians first took the Hippocratic Oath, we committed ourselves to professional and ethical obligations to self-regulate via using different approaches and strategies to remain competent and accountable to the public. Keeping this in our minds, hearts, and consciences will affect how we interpret CPD, leading to a greater appreciation of our role in its effectiveness and to our recognition of the importance of our passionate commitment to contribute actively to progressing the educational process.

Continuing professional development evolution

Evolution of CPD is a multidimensional, context-dependent process. In this chapter, we aim to delve into the process of CPD evolution, which varies in pace from time to time, region to region, and situation to situation. It must be emphasized that CPD evolution is an ongoing process. Therefore a discussion of this stimulating subject cannot be concluded.

Over the past few decades, there has been a growing interest in CPD. Dynamic system changes and emerging notions have contributed to its 'metamorphosis'. The change process encompasses different domains, including definitions, learning formats, accreditation, credits, the CPD community, CPD effectiveness, globalization, and disruptive innovations (Fig. 5.1).

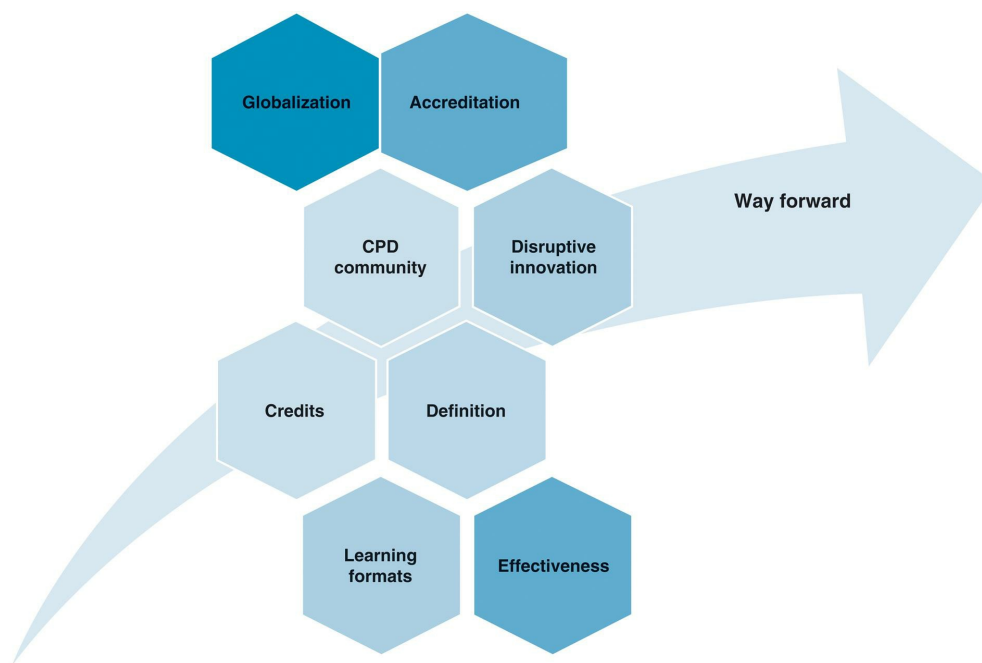


FIG. 5.1 Continuous professional development (CPD) evolution.

From continuing medical education to continuous professional development: achieving a mature definition

Learning for better practice performance has always been the main driver of continuing education. CME was long seen as the delivery system to achieve this goal. Emerging evidence reinforced the need to revisit this notion, and hence, to move towards a broader concept of CPD. CPD is an outcome-oriented process; its effectiveness can only be illustrated by improving practice performance and hence healthcare outcomes. The transformation from CME to CPD urged different stakeholders to revisit their approach

and strategy to manage and achieve an effective CPD process. The changes that emerged from this reflection included teaching learners to be more reflective, self-driven, patient-centred, and to take greater responsibility for their own learning. CPD providers have been reshaping the planning, delivery, and evaluation of CPD. Healthcare systems, regulators, and institutions prioritized the need to demonstrate enhanced quality of care and improve patient outcomes to build solid evidence for the effectiveness of CPD.

Continuous professional development regulation: credits are optional, improvement is mandatory



"CPD is the periodic reaffirmation of physicians' competence"

Andrew Padmos

There is no doubt that revalidation is essential to ensure that HCP update their knowledge and skills and remain fit to practice. CPD requirements for revalidation purpose vary temporally and spatially. Variations might relate to disciplines and specialties within the healthcare profession, formats of learning, and the need for credits as a prerequisite for either relicensure or recertification. Over the last few years, an increasing number of medical regulatory authorities have made participation in 'accredited' programmes of CPD mandatory for all licensed healthcare providers. Such participation is regarded as a mechanism to ensure the ongoing competence of HCP and provide public reassurance. However, to guarantee the intended outcomes of CPD, considering the following implications is worthwhile:

- Regulators should keep pace with technological revolution, scientific progress and healthcare system changes ([Christensen et al., 2009](#)).
- Regulatory authorities should be aware of the influence of various types of CPD on practice ([Bennett et al., 2000](#)).
- Regulators should use strategies and approaches that ensure HCP ownership of their own learning and competence.
- Regulatory bodies should work closely with other stakeholders to make revalidation in healthcare more credible.
- In the rapidly changing world of medicine, revalidation requirements should be revised periodically. Otherwise, 'false positive' revalidation is a likely risk.

In conclusion, despite the necessity of recording CPD credits as a 'quantitative' means to ensure compliance with regulatory requirements, however, in my opinion, the fundamental truth remains that credits are optional but improvement is mandatory. Endorsement of this message is imperative to achieving effective CPD and eventually improving healthcare quality.

The progression from group to individualized learning: one size doesn't fit all

Formats of learning have been extensively discussed in CPD literature. Interactive activities have always been described as superior to didactic or lecture formats. However, in this section, we focus on the learner rather than the activity.

Learning styles and learners' cognitive psychology and embracing relevant theoretical models in the management of the CPD process are fundamental if we aspire to achieve more effective outcomes. Educational research goes beyond the simple idea of activity format to the practical implications of appreciating the different styles of learning and the diversity of learners. Individualized learning is a multidimensional process that considers personal characteristics, job description, organizational structure and other factors. The timing, setting, monitoring and feedback are crucial elements in this learning approach. Perceived barriers to individualized learning are resources, accessibility and required expertise in educational theories and cognitive psychology. Ensuring the availability of diverse formats of activities, use of different learning modalities and applying the principles of self-directed learning are some ideas to address those challenges.

A number of learning theories that illustrate different learning styles are available. I elected to highlight two of them in this section; the VARK theory ([Fleming, 2001](#)) and the Kolb's cycle ([Kolb, 1984](#)). The acronym VARK identifies four types of learners: visual, auditory, reading/writing, and kinesthetic; each responds best to a learning modality. The Kolb's Experiential Learning Cycle is concerned with the learner's internal cognitive processes. It involves 'the acquisition of abstract concepts that can be applied flexibly in a range of situations' ([McLeod, 2017](#)). According to Kolb's, the four stages of learning are: concrete experience, reflective observation, abstract conceptualization, and active experimentation, in which the learner 'touches all the bases'.

It is important to recognize the relationship between the concepts encompassed in the models mentioned earlier, individualized learning and knowledge transfer. Further explanation of this notion is provided under the knowledge transfer section.

Knowledge transfer: from bench to bedside

Knowledge transfer (KT) is generally described as the acquisition, apprehension and aggregation of new knowledge ([Liyanage et al., 2009](#)). Within the medical field, KT is distinguished as a communication process that aims to address the patient needs and enhance the healthcare quality ([Graham et al., 2006](#)). In healthcare, CPD and KT are seen as interrelated. There are different conceptual models informing each field, many of them comparing similarities and difference between the two processes. The models include the 'knowledge-to-action' (KTA) cycle informing KT, models informing CPD curriculum design and individual self-directed learning, and the Kirkpatrick model for evaluating educational outcomes ([Patoine & Ebrahimi, 2012](#)).

A proposed model for knowledge transfer in continuing professional development

In this section, I propose a model for the process of knowledge transfer in CPD that is inspired by VARK's and Kolb's models (Fig. 5.2).

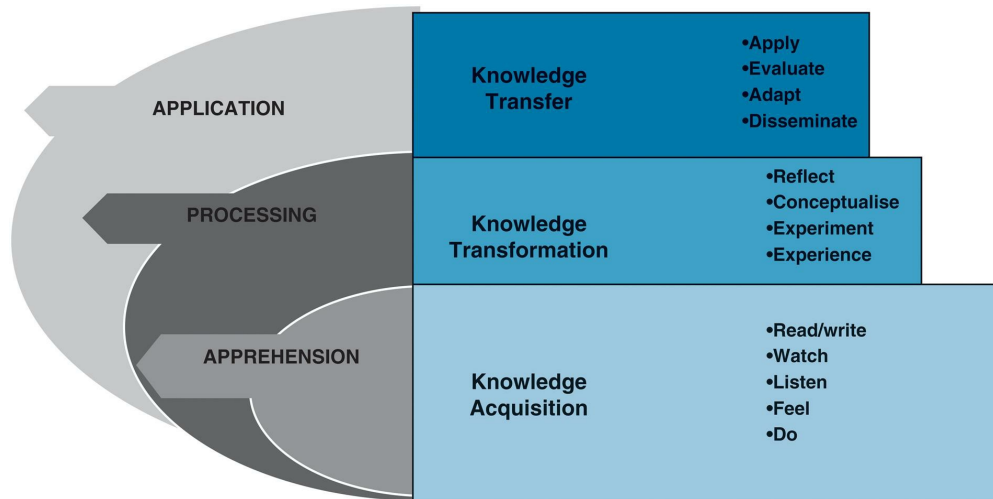


FIG. 5.2 A suggested model for knowledge acquisition, transformation and transfer based on different learning styles and diversity of learners.

The proposed model illustrates three sequential phases in the process of learning: knowledge acquisition, knowledge transformation and knowledge transfer. Learning styles and learners' preferences are incorporated within the process. The three phases are closely interrelated with areas of overlap. Successful transition from one phase to another depends on the understanding of learning styles and the use of different approaches of 'individualized learning', as well as the accommodation of different KT formats.

Phase 1: Apprehension

Selection of the appropriate learning modality that facilitates the knowledge acquisition process is pivotal to the apprehension phase. This varies from one learner to another. As some learn best by visualization, others prefer reading and writing. There are also the doers and the listeners. In the field of medicine, where palpation is an important element of the physical examination, feeling may be also considered as a learning modality.

Phase 2: Processing

Successful knowledge acquisition proceeds to and overlaps with the phase of

knowledge transformation. Ideally, effective processing of the acquired knowledge passes through four stages:

1. Reflection: learners review, analyze and contemplate the new learning experience.
2. Conceptualization: learners draw conclusions and make resolutions.
3. Experimentation: learners strategize an experimentation plan and test the new concepts.
4. Experience: learners apply the tested concepts to their practice setting.

Passing through the four stages of knowledge transformation solidify the process and is essential for meaningful application of the new knowledge. During this process, more knowledge acquisition may be sought and new knowledge is acquired.

Phase 3: Application

As mentioned earlier, KT in healthcare is meaningless if it has no positive impact on practice performance. This phase measures the effectiveness of learning in the process, as well as the commitment of HCP to improve their performance. Four activities are incorporated in this phase; application, evaluation, adaptation and dissemination. First, HCP apply the knowledge to their practice setting, followed by evaluation of the modified care process. Favourable evaluation outcomes support the adaptation of HCP to change. System and workplace adjustments are highly recommended to reinforce the adaptation step. Dissemination of knowledge and advocating for process change represent the final step. It is not expected that all HCP reach the dissemination step. This depends on many factors including a robust processing phase, commitment of HCP and a supportive healthcare system. The more steps achieved, the more fruitful the application phase is. Monitoring, follow-up and feedback are crucial in this phase. This phase lasts until the acquisition of new knowledge occurs.

Practical implications of the model

This model informs the planning and management of the CPD process. It implicates appropriate design of the activities which accommodates and respects different learning modalities. Commitment to practice change and enhanced performance should be encouraged by promoting reflective practice. Healthcare systems and organizations need to support experimentation and acknowledge new experiences by embracing changes and innovations. CPD planning should include monitoring, follow-up and feedback, as well as ensuring appropriate peer communication and networking opportunities.

Performance improvement: the valid means for measuring continuous professional development effectiveness

Performance improvement is an evolving practice that is considered as an integral part

of today's healthcare system. Although, healthcare improvement initiatives do not have to be intense or to generate radical change in the process of care, supporting a culture that embraces continuous performance improvement by applying frequent, small, diverse and sustained CPD activities has a significant impact on the practice performance and the quality of care ([Raef, 2004](#); [Tufts Health Care Institute, 2002](#)). Evolution of performance improvement is driven by many factors. Amongst which are public awareness and demands of higher quality and accountability, accrediting bodies requiring demonstrated performance improvement activities and the financial concern of cost effectiveness while maintaining the quality of care ([Wenghofer et al., 2014](#)). In addition to HCP performance, planning for CPD should consider other factors that influence clinical decision making, such as organizational and system factors, as well as the complex interdependence of clinical care teams ([Wenghofer et al., 2009](#)). CPD is more likely to be effective if three conditions are met: learning is linked to practice, educational activity is linked to personal incentive rather than outside influences, and the educational event is followed by reinforcing activities ([Bamrah & Bhugra, 2009](#)).

Accreditation: the heart of continuous professional development

Accreditation is seen as the primary means of assuring and improving academic quality ([Council for Higher Education Accreditation](#)).

Over the last few years emerging concepts in CPD accreditation have evolved. In this section, two concepts will be featured: joint accreditation and substantial equivalency. The reason I elected to highlight these concepts is the practical values added to accreditation systems and CPD programmes by the two highly constructive and meaningful notions. Benefits include simplifying accreditation processes, saving resources, providing more opportunities for peer and comprehensive system review, promoting interprofessional education, supporting the development of emerging systems in the fields of accreditation and CPD and realization of CPD globalization.

- **Joint accreditation:** refers to a system that enables organizations to be simultaneously accredited to provide medical, nursing, pharmacy, and potentially other continuing education activities through a single application process using a unified set of accreditation standards ([Joint Accreditation for Interprofessional Continuing Education](#)). The first Joint Accreditation system for interprofessional continuing education was established in 2009 as a collaboration of the [Accreditation Council for Continuing Medical Education \(ACCME\)](#), American Nurses Credentialing Center (ANCC) and the Accreditation Council for Pharmacy Education (ACPE). The system has made great strides in furthering interprofessional education (IPE) and reinforcing CPD accreditation. More professions are continuously joining the joint accreditation providing more CPD and IPE opportunities to HCP. Other countries and systems are adopting the Joint Accreditation model. In 2016 Qatar launched its national CPD accreditation system. The system allows different

CPD providers to apply for accreditation via a single process. Once accredited, the organization can provide IPE or CPD activities to different healthcare professions and grant appropriate credits according to a set of standards.

- **Substantial equivalency:** is a process that is 'based on the ability of each CME/CPD accreditation system to demonstrate or reflect a common set of values, principles and metrics' ([International Academy for CPD Accreditation](#)). The purpose of the process is to reinforce international collaboration among CME/CPD accreditors, facilitate continuous improvement in accreditation, and expand opportunities for HCP to participate in high-quality educational activities around the world ([Accreditation Council for Continuing Medical Education](#)). With the growing interest of mutual recognition and substantial equivalency between CPD accreditation systems, cultural differences and regional healthcare needs within different healthcare systems should not be neglected. Therefore a unified system should not be the goal of the process. *"Besides being impractical and difficult to achieve, it might also limit innovations in accreditation of CPD systems and programs"* ([McMahon et al., 2016](#)). It is important to remember that full harmonization of accreditation systems is neither possible nor desirable. Instead, shared principles and values with substantial commonality should be encouraged. As international systems vary in details, systems' differences would also be expected and accepted thus promoting exchange of ideas and stimulating innovation ([Aboulsoud & Filipe, 2019](#)).

In my opinion, setting valid accreditation principles is the science that ensures the quality of education. On the other hand, proper application of standards is the art that recognizes imperfection in the CPD process and enlightens providers to continuously refine their programmes and activities.

Globalization: continuous professional development without borders



"Transnational or global education goes well beyond spatial mobility"

Ronald Harden

CPD globalization process is driven by common educational principles and management trends. International collaborative engagement of different CPD stakeholders makes globalization of CPD standards possible. This opens doors for HCP to attend international CPD activities to improve their competence but also convert credits for relicensing or recertification purposes.

According to lessons I have learnt from practice and interactions with CPD professionals from around the world, I believe that achieving globalization requires building effective relationships at national and international levels to address the challenges across healthcare delivery systems, as well as the discrepancies between

regulatory requirements across the world. CPD without borders should be dedicated to the needs of a diverse target audience, thus providing meaningful content and longitudinal engagement. Understanding regional and system differences, as well as personal and work characteristics, are key factors in embracing cultural diversity in CPD.

It is important to acknowledge that a unified CPD system is NOT our goal. An alignment approach, based on flexibility and innovation, rather than a consensus to system details should be entertained in our discussions ([Aboulsoud & Filipe, 2019](#)).

Transnationalization of continuing professional development

In 2007 Ronald Harden introduced the concept of transnationalization in medical education as superior to internationalization ([Harden, 2007](#)). Reinforcement of the concept of medical education continuum and meaningful integration of CPD as an important part of this continuum would benefit from the transnationalization notion. As compared with graduate medical education, I believe transnationalization of CPD is a broader and more comprehensive approach that should be explored and aspired for. This movement is envisioned to transform the CPD globalization from mutual agreements between organizations across the world to a more integrated system unconstrained by physical, cultural and political boundaries.

The continuous professional development community: empowering the profession

The CPD community has flourished over the last years. This is demonstrated by the growing number of CPD professionals, professional societies, and scholarly platforms. CPD professionals, including providers, educators, administrators and researchers, play an instrumental role in the CPD process. It is their responsibility to actualize meaningful CPD. Creating an educational environment that supports active learning and quality education is their challenging mission. This demands highly competent professionals capable of supporting contextual learning, as well as demonstrating creativity and innovation in the evolution of CPD. Healthcare systems and academic institutions should work together to ensure CPD professionals are supported, authorized and competent through providing ample development opportunities that aligns with the latest evidence and best practices. CPD professional societies are becoming an increasingly active contributor to the CPD community. These societies provide lots of development opportunities for CPD professionals including networking, training courses and certifications. Examples of these societies are The Association for Medical Education in Europe (AMEE), Alliance for Continuing Education in the Health Profession (ACEHP), Global Alliance for Medical Education (GAME) and The Society for Academic Continuing Medical Education (SACME).

The fact remains that an effective CPD community needs to actively collaborate, continuously improve and contribute to the CPD accreditation systems to actively

reinforce the learning environment and promote excellence in CPD.

The future of continuing professional development: technology and disruptive innovation



"The Future is Today"

William Osler

Disruptive innovations and groundbreaking technology are fundamental game changers in the future of CPD. Truly disruptive innovations in CPD will impose new methodologies that support the learning process and guarantee the effectiveness of CPD. Advancements in planning and instruction, as well as empowerment of new educational tools and learning formats, are expected to surpass today's practice. Technology and disruptive innovations are likely to boost individualized learning and realize the concept of personalized education.

Moving forward, in today's fast paced environment, systems need to be more permissive and embrative of creativity and innovations. CPD providers need to endorse futuristic approaches rather than adopting trending processes. However, they should be aware of the challenges that might be faced and be ready to address them in a systematic manner. Cultural diversity, generations differences, personal and work characteristics are examples of these challenges. It is to be acknowledged that change will never be easy and CPD providers should be brave to lead and manage change. Healthcare systems are required to ensure CPD providers are well equipped by relevant knowledge and competences that support innovative practice and futuristic thinking instead of the routine training that endorses classical thinking.

Continuing professional development: from good to great

A change for the better is what we aspire for in healthcare and in CPD as a significant contributor to the quality of healthcare systems. A better CPD is likely to foster meaningful learning rather than simply teaching. The movement from good to great in a pragmatic approach is facilitated by 'getting the right people on the bus and in the right seat' as described by Jim Collins ([Collins, 2001](#)). In my opinion, a great CPD system requires synergetic integration of our values through effective leadership and evident collaboration. This translates to encompassing differences, while sustaining well-established values and principles. A great CPD system is a dynamic one that is responsive to needs and feedback. It appreciates the tactful use of validated data and evidence by influential leaders who are brave enough to introduce systematic reforms in medical education where CPD is structured and managed as a constitutional element of the medical education continuum.

Summary

An effective CPD system is organized, structured, cost efficient and responsive to stakeholders' feedback. Engaging HCP in their own learning and involving them in the CPD planning process is another indicator of an effective CPD system. It is therefore of critical importance to maintain and reinforce relationships amongst stakeholders in order to sustain a dynamic CPD system that is responsive to the ongoing changes in healthcare, is relevant to individual needs of HCP and is accountable to the public. It is to be emphasized that the evolution of CPD is an ongoing process and that embracing creativity and innovation plays a crucial role in CPD system advancement. However, successful adoption of innovation requires tactful planning. This implies relevance and simplicity, time of introducing a new innovation, validity of the idea, cost effectiveness and reasonable system implications. A committed, influential and passionate leadership that is capable of introducing reforms, as well as skillfully managing the change process plays a leading role in CPD reformation.

References

- Aboulsoud and Filipe, 2019 Aboulsoud S, Filipe H. Opening Editorial: CPD and Lifelong Learning: a call for an evidence-based discussion. *MedEdPublish*. 2019;8(1):1.
- Accreditation Council for Continuing Medical Education Accreditation Council for Continuing Medical Education. Accessed at: www.ACCME.org.
- Bamrah and Bhugra, 2009 Bamrah JS, Bhugra D. CPD and recertification: improving patient outcomes through focused learning. *British Journal of Psychiatry Advances*. 2009;15:2–6.
- Bennett et al., 2000 Bennett NL, Davis DA, Easterling Jr WE, et al. Continuing medical education: a new vision of the professional development of physicians. *Academic Medicine*. 2000;75:1167–1172.
- Cervero, 2001 Cervero R. Continuing professional education in transition. *International Journal of Lifelong Education*. 2001;20(1/2):16–30.
- Chaudhry et al., 2012 Chaudhry HJ, Talmage LA, Alguire PC, Cain FE, Waters S, Rhyne JA. Maintenance of licensure: supporting a physician's commitment to lifelong learning. *Annals of Internal Medicine*. 2012;157:287–289.
- Christensen et al., 2009 Christensen C, Jerome G, Jason H. *The innovator's prescription: a disruptive solution for health care* McGraw-Hill 2009.
- Clayton Christensen Institute Clayton Christensen Institute. Accessed at: www.christenseninstitute.org.
- Collins, 2001 Collins JC. *Good to great: why some companies make the leap and others don't*. New York, NY: Harper Business; 2001.
- Council for Higher Education Accreditation Council for Higher Education Accreditation. Accessed at: www.chea.org.
- Fleming, 2001 Fleming, N. VARK – Multimodal Study Strategies. 2001. Accessed at: www.vark-learn.com.
- Graham et al., 2006 Graham ID, Logan J, Harrison MB, et al. Lost in knowledge translation: time for a map?. *The Journal of Continuing Education in the Health Professions*. 2006;26(1):13–24.
- Harden, 2007 Harden R. International medical education and future directions: a global perspective. *Academic Medicine*. 2007;81:S22–S29.
- International Academy for CPD Accreditation International Academy for CPD Accreditation. Accessed at: <https://academy4cpd-accreditation.org>.

- Jameson, 2014 Jameson JL. Disruptive innovation as a driver of science and medicine. *Journal of Clinical Investigation*. 2014;124(7):2822–2826.
- [Joint Accreditation for Interprofessional Continuing Education](#) Joint Accreditation for Interprofessional Continuing Education. Accessed at: www.jointaccreditation.org.
- Kolb, 1984 Kolb DA. *Experiential learning: Experience as the source of learning and development*. Vol. 1 Englewood Cliffs, NJ: Prentice-Hall; 1984.
- Liyanage et al., 2009 Liyanage C, Elhag T, Ballai T, Li Q. Knowledge communication and translation - a knowledge transfer model. *Journal of Knowledge Management*. 2009;13(3):118–131.
- Lowe et al., 2009 Lowe MM, Aparicio A, Galbraith R, Dorman T, Dellert E. The future of continuing medical education: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. American College of Chest Physicians Health and Science Policy Committee *Chest*. 2009;135(3 suppl):69S–75S.
- Macnair, 1999 Macnair T. Medical ethics. *British Medical Journal*. 1999;319:S2–7214.
- McLeod, 2017 McLeod, S. A. (2017). Kolb - learning styles. Simply Psychology. Accessed at: www.simplypsychology.org/learning-kolb.html.
- McMahon et al., 2016 McMahon G, Aboulsoud S, Gordon J, et al. Evolving alignment in International Continuing Professional Development Accreditation. *Journal of Continuing Education in the Health Professions*. 2016;36:S22–S26.
- Patoine and Ebrahimi, 2012 Patoine, M., Ebrahimi, M. (2012). Knowledge transfer in the continuing professional development of physicians: characteristics of context, roles and responsibilities: a comparative analysis of Canada, the United States and England. Montréal: Université du Québec à Montréal.
- Raef, 2004 Raef S. Five years after To Err is Human: a look at the patient safety landscape. *Focus on Patient Safety*. 2004;7.
- Tufts Health Care Institute, 2002 Tufts Health Care Institute. (2002). Boston, MA. Accessed at: www.tinci.org/other_resources/glossaryquality.html.
- Wenghofer et al., 2014 Wenghofer EF, Marlow BA, Campbell C, et al. The relationship between physician participation in continuing professional development programs and physician in-practice peer assessments. *Academic Medicine*. 2014;9(6):920–927.

Wenghofer et al., 2009 Wenghofer EF, Williams AP, Klass DJ. Factors affecting physician performance: implications for performance improvement and governance. *Healthcare Policy*. 2009;5(2):e141–e160.

World Federation for Medical Education World Federation for Medical Education. Accessed at: www.wfme.org.

The Hidden Curriculum

Elizabeth Gaufberg and Fred W Hafferty

Trends

- The hidden curriculum (HC) is an omnipresent part of all medical learning environments.
- It differentiates between what is formally/intentionally taught versus the range of other lessons students informally and tacitly acquire during training.
- It can be both positive and negative.
- It cannot be eliminated, but it can be managed.
- A major source of HC messaging comes via role modelling.
- The HC is a major socializing force and thus plays an important part in professional identity formation.
- The HC plays a substantive role in student mistreatment.

Key concepts

- Socialization: the processes by which newcomers/outsideers become in-group members.
- Workaround: an agreed upon, often unofficial, fix for a systems-based problem.



"The real voyage of discovery consists of not in seeking new landscapes but in having new eyes."

Marcel Proust

Introduction

The hidden curriculum (HC) is a theoretical construct for exploring educational life. At its most basic level, HC theory highlights the potential for gaps or disconnects between what the institution or faculty intends to deliver (the formal curriculum) and what learners take away from those formal lessons; all operating within a system's framework that emphasizes context and the interconnections and interdependencies of system elements. Examples of key influences include pedagogic methods (how content is delivered and learning is evaluated), the relational context (interactions among faculty and students, including factors, such as power and hierarchy), physical context (space, layout, noise) and the context of organizational culture and group values. Building on this conceptual platform, HC theory also recognizes that much of social life, including what happens in educational settings, takes place 'beneath the radar' because the predominance of daily life, educational or otherwise, is routinized and thus taken for granted. Also fundamental to the idea of a HC is the understanding that becoming a physician involves processes of professional socialization and identity formation within the cultures and related subcultures that make up medicine and medical practice.



"We (faculty) are teaching far more than we know. Every word we speak, every action we perform, every time we choose not to speak or act, every smile, every curse, every sigh is a lesson in the hidden curriculum."

Gofton and Regehr (2006)

Any attempt to penetrate, decode and ultimately exert an influence on the HC begins by dissecting the formal curriculum, and thus what is supposed to be going on, at least according to those in power. With this as our foundation, we then can proceed to explore 'what else might be happening'. The space between the official and unofficial, the formal and the informal, the intended and the perceived then becomes our primary workspace. In doing this work, it is important to remember that the HC is not a 'thing' that one finds, fixes and then files in a 'completed projects' drawer. There always are latent and tacit counterparts to the formal and intended curriculum. Context always exerts an influence. There always are unrecognized and underappreciated factors that influence social life. There always are things that become so routine and taken for granted that they become invisible over time. Purposeful inquiry may uncover and intentionally address pieces of these influences, but no discovery is ever complete, and no solution is ever permanent. Finally, the HC system's perspective requires us to acknowledge that any change in context and situation generates a new set of dynamics and thus new sets of influences, which in turn help to construct new sets of relationships between the formal and hidden dimensions of social life.

Historical context

HC theory has deep conceptual roots within two academic disciplines: sociology and education. Philosopher and educational reformer John Dewey, for example, wrote regarding the importance of 'collateral learning' and the prevailing importance of indirect versus direct classroom instruction in arguing that the incidental learning that accompanies school and classroom life has an even more profound effect on learners than the formal or intended lesson plan. Dewey may not have used the term 'hidden', but he clearly was concerned with the coincidental, unintended, unnoticed and unconscious dimensions of learning.

Sociology, in turn, has had its own set of conceptual precursors, particularly its long tradition of differentiating between the formal and the informal aspects of social life. For example, sociology differentiates between social norms, which often function on an informal level, and laws, which are codified. Moreover, sociology recognizes that there are many instances where norms have a more profound effect on social practices than laws: think of the difference between the posted road or highway speed limit (formal) and the more informal boundaries of acceptable driving speed that govern the actions of both drivers and law enforcement. Joining sociology are the academic literatures of business, management studies, and organizational sciences each with a rich history of differentiating between the formal and informal aspects of work, including how one learns 'on the job'.

Since the 1990s, there has been a steady stream of articles in medical education literature featuring the HC as a conceptual tool for examining medical training. Topics have included work on professionalism, ethics instruction, faculty development, gender issues, examination policies, identity formation and socialization, summative assessment, reflection, resource allocation, cultural competency, the impact of block rotations on student development, longitudinal training, messages conveyed in case studies, the training of international medical graduates, workforce issues, medical student specialty choice, relations among specialty groups, the HC of scientific research, simulation and tools to measure the HC. The concept has been used to explore issues across medical specialties ranging from anaesthesiology to surgery, across all levels of medical training from premedical education through medical school, residency training and onto continuing medical education, and to explore related concepts, such as humanism ([Martimianakis et al., 2015](#)). There is a vibrant HC literature in nursing, dentistry, pharmacy and a range of other health occupations, including interprofessional education venues. The HC also has been used to examine educational issues in over 50 countries, and with publications in several languages in addition to English.

Definitions and metaphors



"Lessons from the hidden curriculum are taught implicitly, through role models, institutional leadership, peers, or during the course of practice..."

Fryer-Edwards (2002)

Despite a rather extensive literature on the HC, and in some cases because of this literature, there can be confusion regarding what does and does not fall under the HC marquee. In this next section, along with subsequent examples, we seek to shed light on this lexiconic muddle.

Definitions

The formal curriculum is the stated and the intended curriculum. This is what the school or the teacher says is being taught. The formal curriculum has at least two dimensions. The first is that it is formally identified as such: be this in writing (course catalogue, website, course syllabus) or orally by a teacher. A second dimension is intentionality. What does the instructor/school intend to teach or convey to students?

Working 'outward' from the formal, we quickly enter a myriad of distinctions and derivations within the other-than-formal aspects of learning. These dimensions may be tacit, indirect, informal, unintended or otherwise invisible to the participants. What they share in common is that they are neither formally announced nor intended.

Educators often use a simple dichotomy to differentiate between the formal curriculum and 'everything else' that may be going on within the educational environment. In doing so, some use the term 'hidden' as a master label for anything other than the formal curriculum. Others may use the terms hidden or 'informal' as synonyms. There is nothing intrinsically wrong with such an approach so long as everyone (investigators, subjects and readers) understands that what is being shoehorned into this latter category often can be quite different in terms of structural properties and impact. For example, the null curriculum covers what students learn via what is not taught, highlighted or presented. A literary analogy from a famous Sherlock Holmes case is of the behaviour of a dog on the night of a murder.



"Gregory (Scotland Yard detective): Is there any other point to which you would wish to draw my attention?"

Holmes: To the curious incident of the dog in the night-time.

Gregory: The dog did nothing in the night-time.

Holmes: That was the curious incident."

Sir Arthur Conan Doyle, 1892

Although students certainly garner a great deal from what faculty fail to emphasize or do not evaluate, this is quite a different type of learning than the more informal rules students tacitly acquire, for example, about how to communicate with a 'difficult patient', how 'best' to present at morning rounds, or how to navigate the various 'workarounds' that are used in different healthcare settings.

At a basic analytic level, we argue for a basic four (formal, informal, hidden, null) category approach to exploring the HC (Table 6.1). In addition to the formal, important learning takes place via the relationships and interactions within the workplace (as one source of the informal curriculum) along with the less visible and/or obvious sources, such as organizational culture (as one source of the hidden curriculum). The actual lessons may be similar, but it is important to maintain a conceptual distinction between informal norms that are widely shared and openly recognized versus those influences that are less obvious to or less recognized by participants.

Table 6.1 Multidimensional Learning Environment

| |
|---|
| Formal |
| Course offerings, Curricula, syllabi, what we 'intend' to teach |
| Other-than-Formal |
| <ul style="list-style-type: none">• Informal: Unscripted interpersonal interactions, role modeling; occurs on rounds, in hallways, in the cafeteria• Hidden*: Messages transmitted at the level of institutional structure, language, resource allocation, policy• Null: What students learn by what is not said |

*The term 'hidden' often is used within the academic literature as shorthand for all 'other-than-formal' curricular aspects.

Metaphors



"There is no question that there is an unseen world. The problem is, how far is it from midtown and how late is it open."

Woody Allen, 1972

Although definitional distinctions can be critical for understanding the various types and sources of learning that take place within our learning environments (LEs), these demarcations also can be quite limiting. This is particularly true in the fluid and enigmatic nature of learning: where influences may be hidden at one point in time, formalized at another, yet with these new formal rules gradually slipping beneath

conscious reflection and scrutiny over time. For these reasons, using metaphors to crystalize thinking about the HC can be quite liberating in suggesting new ways of thinking about the forces that shape learning. Thus we might use the ubiquitous metaphor of the iceberg, with its above-the-surface/visible versus its below-the-water-line/invisible dimensions in reminding ourselves that the less-than-visible aspects of educational life may be more consequential than those that sit above the surface. Alternatively, we might embrace the more enigmatic metaphor of physics with its alternative realities, or the fact that most of the universe is made up of something (dark matter) that is invisible to observers and therefore must be ascertained indirectly. The claim that much of organizational life is shaped by invisible or hidden forces may sound like hyperbole until one realizes how many different areas of science are rooted in a similar contention. After all, we know that most communication is nonverbal, that approximately 80% of mental processing takes place at an unconscious level, and that approximately 80% of effects come from 20% of the causes (e.g., the Pareto 80–20 principle). These realities should at least give us some pause in wondering how much of what our students learn can be attributed solely to our intended curriculum.

Applications: exploring/assessing the hidden curriculum



"...the chief barrier to medical professionalism education is unprofessional conduct by medical educators, which is protected by an established hierarchy of academic authority. Students feel no such protection..."

Brainard and Brislen (2007)

Applying the HC to issues of student learning and faculty development is not an easy or risk-free undertaking. It can involve considerable time and effort, and because it stands in contrast to a 'pure' teaching model (where students are viewed as empty vessels eagerly waiting to be filled by the knowledge, skills, behaviours and values possessed by their faculty), framing issues from a HC perspective may be both disquieting and engender resistance. Nonetheless, by exploring the interface between the formal and the other-than-formal aspects of your own LEs, you may come to more deeply appreciate how the learning taking place within medical training is shaped by the broader sociocultural environment within which all organizations are located ([Hafferty et al., 2015](#)). In this section, we outline practical methods to explore the other-than-formal aspects of LEs. This is an essential step in aligning what we intend to teach with what is actually learned by our trainees.

1. Getting started: Learners (faculty and students) should be familiar with the overall conceptual framework, as well as key terms (e.g., formal, informal, hidden, null). Being aware of the phenomenon, and ensuring that others in the LE are aware and open to discussion as well, often can be a big part of the solution. Help learners tune in to the unintended or unscripted learning moments that exist within the educational environment. For example, you might ask students to identify the messages or learning points embedded in common scenarios:
 - a. The third-year medical student is expected to do nonmedical tasks, such as picking up food for team members.
 - b. Your physician stays at work until very late most nights. She often misses family events. Residents who stay late are lauded as 'heroes' or 'champs'.
 - c. Your resident pronounces your 16-year-old patient with cystic fibrosis dead and sits down with you to reflect on the event and to mourn the loss of the patient you cared for together.
 - d. Your attending talks about the patient's diagnosis and poor prognosis to the ward team in front of the patient and without including the patient in the conversation or asking if he has any questions.
 - e. Your grade on a particular rotation is determined largely by your score on a

multiple-choice content exam.

- f. You hear a morbidly obese patient repeatedly being referred to as a hippopotamus by the intern and resident on your team.
- g. You never observe a resident or attending take a sexual history.
- h. A patient makes a racist comment to a student, which the team does not acknowledge ([Chandrashekar & Jain, 2020](#))

Another exercise useful in highlighting the differences between formal and informal curricula is asking learners to identify the 'top 10 things I learned in medical school that I wasn't supposed to' ([Dosani, 2010](#)). Similarly, both faculty and students can examine their own contribution to the educational environment by asking them to reflect on how they function as role models in various learning environments.

2. Participant-observer inquiry: Learners can take on the role of an amateur 'anthropologist of medical culture' ([Harvard Macy Faculty, 2011](#)). A brief overview of basic ethnographic methods, such as mapping the educational space and objective methods of data collection, can be very useful here. Trainees may be asked to describe how people are dressed, the tools they equip themselves with, how they introduce themselves, where they stand or sit when they are in a group, who speaks first and the language used, or the roles assumed by different members of the healthcare team. Faculty can be asked to do the same exercise. Comparing these two lists can be quite revealing. This method can be used in preclinical and clinical settings. In the preclinical setting, one may explore the relative participation (e.g., 'airtime') of faculty versus students in different LEs. In addition, one can examine the use of technology, such as laptops or hand-held devices, attendance rates, and late arrivals and the content of pre- and postclass conversations. In clinical settings, such as rounds, a volunteer can time approximately how many minutes are devoted to patients' social/emotional needs versus a range of other topics, such as health insurance and other 'business' considerations, the presence of humour, joking or nonpatient-related conversations. Asking trainees to write their anthropologic observations in the third person, as if they are an outsider assigned to 'look in' to a strange new world, can help with the cultivation of 'HC eyes'.
3. Share stories from the hidden curriculum.
 - a. Provide scheduled time and space, protected from other responsibilities, for sharing, listening and reflecting on student experiences. The use of triggers from the humanities (art, poetry, literature, film) can provide the learner critical distance and a safe opening to the sharing of personal experiences. Such opportunity for reflection is an important aspect of professional development, and may stem negative effects of the emotional suppression experienced by many medical students, and ultimately may help prevent ethical erosion.
 - b. The following writing exercise has proved useful at one medical school ([Gaufberg et al., 2010](#)). Post an introduction to the HC concept, assign

students to write a brief reflection paper in which they tell a story from the HC and reflect on it. In doing so, students might be asked to take on the earlier-noted role of participant-observer/ 'anthropologists of medical culture'. These stories can be used to start a discussion. With student permission and/or deidentification, stories may also be used as a form of feedback to faculty and others in educational (grand rounds, workshop) settings, with the opportunity for discussion. Dramatic enactment of the stories in the form of Readers' Theatre can be particularly powerful as a starting place (Bell et al., 2010). On a larger scale, the sharing of humanizing examples from the informal curriculum ('appreciative inquiry') can be an effective means to effect positive institutional change (Suchman et al., 2004).

- c. Have students explore what sociologists refer to as the 'oral culture' of medicine by having students gather and share stories they have heard faculty tell about medical practice and/or life as a physician. Work to decode the underlying cultural, moral and normative messages that may be embedded in these stories.
4. Focus attention and reflect upon workarounds. Workarounds are the other-than-formal/unsanctioned ways of getting work done where the official or 'right' way is seen as inefficient, dysfunctional, out of date or otherwise not appropriate. Workarounds can be found in the classroom or in the clinic or wards. Although there are no printed rulebooks for workarounds, initiates soon learn their critical role in getting things done. They also learn that there are right and wrong ways to perform these off-the-books practices. Ask students to come up with one example of a workaround they have engaged in or observed. Ask: How did you learn the rules of this particular workaround (observation, role modelling, clues from an insider)? Encourage students to explore why we even have workarounds, particularly in the face of an ever more highly structured work environment.
5. Focus on microethical challenges. Some authors and educators have argued that exploring day-to-day microethical challenges (Is it okay to 'practise' on patients? What do I do if my resident asks me to falsify a chart? Do I laugh at this dehumanizing joke?) are more developmentally appropriate for medical students than teaching about ethical challenges they will face only as full-fledged clinicians. Microethical challenges often occur within a hierarchy of evaluation in which students believe that the process or outcome of their decisions may have an impact on their grade. Various online forums such as professionalformation.org allow students to share and problem-solve challenges collaboratively.
6. Turn your attention to the null curriculum. Review teaching objectives and/or content with an eye towards things that may have been left out. Review your formal curricular offerings and explore how 'missing topics' might communicate messages to both faculty and students about what is and what is not within the scope of the doctor's concern. Are racial and other disparities

and/or the social determinants of health discussed? Correspondingly, what might your patients be concerned about that you fail to discuss or teach? These types of exercises can be particularly difficult. After all, how does one know when something is missing? Nonetheless, decoding what is missing can have a profound impact in reshaping how one does things in the future.

7. Inventory and take stock of your physical surroundings. How much and what kind of space does your school devote to clinical learning versus other organizational objectives, such as administration or research? A school dominated by lecture rooms but with little space for small-group learning more than likely will stress didactic over interactive learning processes. What about student and faculty awards? Where do you post them, if at all? There is a substantial 'meaning difference' between schools that post awards in highly trafficked areas and those that use a back hallway. In the clinical LE, does the set-up favour patient-centred human connection or is the design for the convenience of staff and/or computer entry? Sometimes physical artefacts can be hiding in plain sight. Over the course of several days, one clinician conscientiously inventoried drug and medical equipment company-branded items as he encountered them during his normal work activities ([Hafferty & O'Donnell, 2015](#)). He was dumfounded by the sheer number and density of what he 'newly saw', particularly items that had been 'hiding' in his office.

Student mistreatment: a case study in applying the HC lens

Although the list of topics amenable to HC analysis is extensive, we have selected student mistreatment for several reasons. First, in an ideal, healthcare training environment, there is no mistreatment. No medical school formally announces that student mistreatment is part of their formal and/or intended curriculum. This singular observation, however obvious, presents us with several interpretive challenges. First, we must be open to the possibility that mistreatment, although not formally claimed, is intended. Second, and even if we eliminate subterfuge, we are left with a range of alternative explanations, including the toleration of something (mistreatment) that is neither claimed nor deliberate. Here, our analytic tree further branches into formal versus tacit acceptance, along with the more conventional possibility that what we have is the presence of fundamental disagreements as to what might constitute mistreatment versus other forms of ‘treatment’ deemed by those with formal control over the LE as necessary in meeting particular pedagogic ends. Thus a HC approach requires us to be open to the possibility that some pedagogic practice, say the Socratic method (including its range of manifestations), may be deemed desirable by one party (e.g., faculty) while intimidating, disrespectful, bullying or abusive by another (e.g., trainees).

Characterizing the latter framings as ‘mistaken’ or ‘naïve’, while certainly the privilege of those in power, misses the HC point. Correspondingly, the claim of mistreatment, even when sincerely perceived, does not make it true. The fact that mistreatment is socially constructed, and therefore is heavily shaped by context, culture and position within medicine’s hierarchical structure, does not automatically privilege either claim. Nonetheless, the HC requires that LEs as contested domains must be remediated. The ‘fix’ may involve student-targeted education on the structure and purposes of such contested pedagogic practices or it may involve changes in the disputed practices themselves (or some combination of explanation and reengineering). Whatever the final determination, learner-based perceptions that they are operating under conditions of mistreatment do not make for a healthy LE.

One key to a robust HC analysis requires that we go beyond the perception of mistreatment as a dynamic in individual relationships to a consideration that organizations themselves, including their structure and processes, can generate, accentuate and/or perpetuate mistreatment—and do so independent of interpersonal interactions as a causal vehicle ([McClinton & Laurencin, 2020](#)). Some may consider an endless cascade of didactic lectures or a parade of scutwork shorn of explanation to be examples of organizational mistreatment. We would concur. In turn, the presence of such structurally based forms of mistreatment, particularly to the degree they exist beneath the radar, will make general accountability and remediation more difficult.

This brings us to a couple of final points on HC decoding. Just as claiming mistreatment does not make it so, the absence of mistreatment claims does not mean that the LE is bereft of mistreatment. Ultimately, a HC approach requires that we

obsessively and exhaustively probe the issue at hand. Mistreatment with respect to what?—We must ask. If our answer is mistreatment with respect to ‘learning’ then we open up a range of interesting challenges, including the possibility that many well accepted pedagogic practices, such as high-stakes testing, particular grading policies, or the competition for scarce resources, such as status positions (class ranking, chief resident), *may* impede or otherwise distort the formally stated goals of learning. After all, LEs are not supposed to be stress free. Recognizing when and how certain types of stressors are necessary for certain types of learning (particularly, in our case, adult learning) is just as emblematic of a HC approach as deconstructing and remediating practices deemed unwanted or counterproductive.

Finally, any HC biopsy of mistreatment must explore the full range of settings where issues of mistreatment exist within the LE. Although there are multiple avenues, we will highlight two here: (1) research/scholarship on mistreatment, and (2) assessments/accreditation of training programmes at the undergraduate and graduate medical education levels. In the first example, we may explore how research privileges certain framings of mistreatment while ignoring others—thus legitimizing the former as being ‘worthy’ of our attention, while delegitimizing the latter as either not worthy of attention or perhaps even something other than mistreatment. In the case of accreditation, how do accrediting bodies hold programmes accountable when it comes to ‘mistreatment’? If they frame mistreatment as located only in interpersonal dynamics, for example, then there is every likelihood that this is how programmes themselves, at the administrative level on down, will come to view mistreatment. In turn, faculty, followed by trainees, will be swept along in a cascade of meaning in which organizational sites of mistreatment fall away from consideration and thus remain unaddressed. In terms of power and influence, accrediting bodies can (and do) set the meaning tone for everyone else.

Ultimately, mistreatment is not so much a Justice Potter Stewart ‘I know it when I see it’ phenomenon (e.g., What is pornography?) as it is something one comes to ‘know better’ when one systematically looks both at its presence and its absence independent of the claims of parties who have an interest in having reality defined in ways favourable to their interests.

Summary



"The relational processes of the hidden curriculum assure the perpetuation of its content."

Haidet and Stein (2006)

Although no single theme can subsume all of the concepts and framings covered earlier, there are a few particulars worthy of final comment. First, the HC is a versatile tool. The concept can be applied to a broad range of health education issues. Medical schools 'teach' far more to both faculty and students than they commonly take credit for: or perhaps would want to take credit for. Similarly, faculty and students are perpetually interactive and mutually influential participants in cocreating the normative soup that fuels the formal, informal and hidden curricula of medical education and medical practice. Second, the HC has an incessant and ubiquitous presence within educational settings. There is no LE without a HC. Its impact may be pivotal or relatively insignificant, but it is there nonetheless. Third, and related, the HC is universal. Whatever else links physicians trained in different countries, and whatever constitutes the shared values that allow us to talk about an authentic and international 'medical culture', there is a HC weaving its way through the particulars of any country and its training. Fourth, working with the HC is a reflective act and thus a form of pedagogic reflexivity. It is just as important to critically examine the structure and dynamics of our LEs as it is to deliver curricular content. Fifth, the HC is relational. The HC, like social life, is built in and around, and nourished by, relationships among participants and between participants and the surrounding environment. Sixth, the apprentice-like model that underscores clinical training and the corresponding need to integrate the learner into the workplace, form an LE that is particularly ripe for HC. Finally, and related, there has been a tendency to execute HC reforms by targeting medical students and medical school faculty while ignoring how organizations, institutions, and sociopolitical relations help shape the problematic situations under consideration. Although the HC is fundamentally about probing the difference between the stated and the received, it ultimately is about context and about situating some 'piece' within a larger relational whole. Regardless of what things look like 'on the surface', the HC is all about subterrestrial context and its connections.

References

- Bell et al., 2010 Bell SK, Wideroff M, Gauferberg E. Student voices in readers' theater: exploring communication in the hidden curriculum. *Patient Education and Counselling*. 2010;80(3):354–357.
- Brainard and Brislen, 2007 Brainard AH, Brislen HC. Viewpoint: learning professionalism: a view from the trenches. *Academic Medicine*. 2007;82(11):1010–1014.
- Chandrashekar and Jain, 2020 Chandrashekar P, Jain SH. Addressing patient bias and discrimination against clinicians of diverse backgrounds. *Academic Medicine*. 2020;95(12S):S33–S43.
- Dosani, 2010 Dosani, N. (2010). *The top 10 things I learned in medical school (but wasn't supposed to!): Plenary Session: The hidden curriculum exposed: perspectives of learners and educators*, Canada, St. John's Newfoundland.
- Fryer-Edwards, 2002 Fryer-Edwards K. Addressing the hidden curriculum in scientific research. *The American Journal of Bioethics*. 2002;2:58–59.
- Gauferberg et al., 2010 Gauferberg E, Batalden M, Sands R, Bell S. The hidden curriculum: what can we learn from third-year medical student narrative reflections?. *Academic Medicine*. 2010;85(11):1709–1711.
- Gofton and Regehr, 2006 Gofton W, Regehr G. What we don't know we are teaching: unveiling the hidden curriculum. *Clinical Orthopaedics and Related Research*. 2006;449:20–27.
- Hafferty et al., 2015 Hafferty FW, Gauferberg EH, O'Donnell JF. The role of the hidden curriculum in “on doctoring” courses. *AMA Journal of Ethics*. 2015;17:130–139.
- Hafferty and O'Donnell, 2015 Hafferty FW, O'Donnell JF, eds. *The hidden curriculum in health professions education*. Lebanon, NH: University Press of New England (Dartmouth College Press); 2015.
- Haidet and Stein, 2006 Haidet P, Stein HF. The role of the student-teacher relationship in the formation of physicians: the hidden curriculum as process. *Journal of General Internal Medicine*. 2006;21(Suppl. 1):S16–S20.
- Harvard Macy Faculty, 2011 Harvard Macy Faculty. *Learning to look: a hidden curriculum exercise* Boston, MA: Harvard Macy Institute; 2011.
- Martimianakis et al., 2015 Martimianakis MA, Michalec B, Lam J, et al. Humanism, the hidden curriculum, and educational reform: a scoping review and thematic analysis. *Academic Medicine*.

2015;90:S5–S13.

[McClinton and Laurencin, 2020](#) McClinton A, Laurencin CT. Just in time: trauma-informed medical education. *J Racial Ethn Health Disparities*. 2020;7(no. 6):1046–1052.

[Suchman et al., 2004](#) Suchman AL, Williamson PR, Litzelman DK, et al. The relationship-centered care initiative discovery team: toward an informal curriculum that teaches professionalism: transforming the social environment of a medical school. *Journal of General Internal Medicine*. 2004;19(5 Pt 2):501–504.

The International Dimension of Medical Education

Trevor John Gibbs, Yingzi Huang and David Taylor

Trends

- Medical migration continues to increase at both undergraduate and postgraduate levels.
- Increased ease of international travel increases the importance of health issues previously relevant to only specific regions of the world.
- Globalization of health issues increases the need for globalization of health professions education.
- Preparedness of the health professionals as future global physicians or universal physicians requires changes in their educational programmes.

Key concepts

- It is an ideal for all medical schools and universities to produce doctors and health professionals who are fit for purpose and fit for practice.
- We can all now be considered as living in an unequal world, a flattened world where ease of travel means that it is possible to fly anywhere within the world in less than 24 hours; a world, however, of disruptive innovations ([Christensen et al., 2015](#)).
- There is now a necessity to produce practitioners who can practice effective health and social care in an everchanging and unpredictable world.
- Health professions curricula, at all levels, must change to ensure that the health professionals are trained to a standard appropriate to not just their local needs but equally to regional and global needs.

Introduction



“Education is the most powerful weapon, which you can use to change the world.”

Nelson Mandela, 1918–2013

In the desire for a global improvement in healthcare and the parallel need for a global increase in the number of trained physicians, there has been a significant increase in the number of medical schools throughout the world. Much of this increase in the number of schools has expectedly happened in the newly emerging countries of increased economic growth, China, India and Brazil. Although this increase appears to have served the population well, it has resulted in some countries having increased capacity within their schools. Fuelled by the ability to charge overseas students for training, perhaps less so by a desire to become global partners, the acceptance of English as the language of study and a desire to travel for medical education, we are now looking at an undergraduate medical migration trend, leading to a created need for a global approach to medical education ([Crone & Samaan, 2013](#)). Although there has been a general decrease in the number of international students opting to study in ‘resource-rich’ countries, many students still migrate from areas where medical education is difficult. Currently, North America, South Asia, and Africa are the largest regions from where students come from, whereas Eastern Europe, China, and the Russian Federation are the most common receiving regions of international medical students worldwide ([OECD, 2019](#)).

The arrival of international students to the accepting medical schools has created a need to revisit curricula and review how the internationalization of medical education affects the quality management of these curricula and take note of the challenges faced by the emergence of new educational trends.

Accompanying this undergraduate medical migration, there is need to develop more faculty, specifically to teach this increasingly expanding and diverse student population. This has led to an appropriate resurgence of interest in faculty development programmes, which are frequently developed by better resourced and educationally more advanced countries and delivered to less well-resourced ones. This too creates a new set of challenges, as those delivering faculty development programmes need to adapt their teaching to suit country-specific and culturally diverse faculty populations.

The following sections of this chapter explore the trends in the internationalization of medical education and the possible challenges faced; the effects upon standardization and accreditation of the curricula, and some possible solutions.

Internationalization of medical curricula



“A major transformative opportunity for improving health among diverse communities worldwide is to reform the vision, programmes, and systems of educational institutions to train health professionals who can meet people’s needs, empower communities, and enhance human wellbeing.”

WHO and UNICEF (2018)

Internationalization has been defined by the Organization for Economic Cooperation and Development (OECD) as *“the integration of an international/intercultural dimension into all of the activities of a University, including the teaching, research and service functions”* (OECD, 2004). In the higher education literature, internationalization of the curriculum has been defined as a process of *“... incorporating international, intercultural and global dimensions into the content of the curriculum as well as the learning outcomes, assessment tasks, teaching methods and support services of a programme of study”* (Leask, 2015).

It is an ideal for all medical schools and universities to produce doctors who are fit for purpose (well suited for their designated role) and fit for practice (having the knowledge, skills and behaviour to practice safely and professionally). To achieve this, future physicians are trained to a specific standard, designed and implemented and relevant to a specific country or nation. Indeed it was the desire of the World Health Organization, when defining the Social Accountability of Medical Schools, that all institutions ensure *“the obligation [of medical schools] to direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation they have a mandate to serve”* (WHO, 1995). The question arises as to what changes are needed to internationalize standard curricula?

The world of the 21st century is changing dramatically, and designing static local or national curricula may not be appropriate. International travel has become easier and quicker, bringing newer and more remote destinations into the tourist trade but at the same time increasing the transportability of diseases, previously only found in remote corners of the world. The global changes in lifestyle have changed the demographics of noncommunicable diseases from diseases of the well-resourced regions to those of the resource-constrained parts of the world. The desire to be ‘better doctors’, which may include having a better standard of living, has increased medical migration—the movement of medical personnel between different countries. The rapid advance in the management of health and disease has created a need to be constantly in tune with what happens in research and healthcare delivery elsewhere in the world. We can all now be considered as living in an unequal world, a flattened world where ease of travel means that it is possible to fly anywhere within the world in less than 24 hours; a world, however, of disruptive innovations (Christensen et al., 2015); we are living in a volatile, uncertain, complex and ambiguous (VUCA) world (Lemoine et al., 2017). Our world is being exposed to tragedy and human suffering, conflict and war, unsocial politics,

climate change, financial hardship and poverty, with an increasing imbalance of wealth distribution. We are experiencing new forms of illness, the SARS, MERS, and COVID-19 epidemics and pandemics, the Zika and Ebola virus outbreaks. Although resource allocation in medicine is facing perhaps a similar threat, medical education can now be seen as a balancing act between meeting specific local healthcare requirements and global health competencies. As a result the World Federation on Medical Education (WFME) specifically states that attention should be paid to local, national, regional and global contexts, implying *“a necessity to produce practitioners who can practice medicine in an everchanging and unpredictable world. ... practitioners who must be clinically and culturally competent as well as being able to use their global knowledge and experience to improve health and wellbeing, irrespective of where they eventually practice medicine”* (WFME, 2003).

Institutions should now be producing medical graduates who can think globally but act locally, to deliver effective healthcare, while adapting to the changing needs of communities and populations, irrespective of where they practice medicine; a model now frequently referred to as globalization (Ho et al., 2017). It was Kanter who suggests that for today's student—*“...by looking through a computer window, they {students} are able, instantaneously, to see almost any place, to connect to almost any person, and to access information about almost any concept... The space in which they move around, as if it were their own room, is the entire world and all recorded history”* (Kanter, 2008); we are now expected to create a global physician.

Educating the global physician

As higher education institutes introduce new internationalization modalities to prepare their students for careers in the globalizing world (Waterval et al., 2015), there is the necessity to create new or modified curricula to match these needs. In their albeit limited review of internationalization of programmes from three different countries (Europe, Asia and the Caribbean), Brouwer and colleagues described two profiles that resulted from international medical programmes; a 'a global physician', equipped with specific competencies for international practice, and 'a universal professional', an overall high-level graduate fit for future practice anywhere (Brouwer et al., 2019). These two outcomes create tension and criticism amongst curriculum developers. Although McKimm and McLean recognize that *"all medical students must be adequately prepared for globalized healthcare practice by exposing them to intercultural communication, health system analysis and global epidemiology"* (McKimm & McLean, 2011), critics of international education have questioned the appropriateness of such curricula for healthcare contexts, being at odds with the concept of social accountability (Crisp & Chen, 2014; Frenk et al., 2010; Prideaux, 2019).

The conclusions from Brouwer et al. (2019) typify the difficulty in curriculum design. The 'global physician' creates a special kind of medical graduate: one with additional skills and competencies to be able to practise globally, frequently based upon programmes that include tropical medicine, extended travel to other countries (mainly in the tropics and/or in resource-constrained countries) and a humanitarian exposure. The alternative, developing the universal professional, calls for a global applicability of the curriculum and is more in-line with the WFME's initiative to ensure that accrediting agencies operate at an internationally accepted standard (Karle, 2007). This is also in keeping with the work of Martimianakis and Hafferty (2013) who also considered the universal professional approach as the most appropriate one. Each approach, however, has its own challenges as discussed in a subsequent section of this chapter.

Internationalization of distant curricula



"No culture can live if it attempts to be exclusive."

Mahatma Gandhi, 1969–1948

Although there is a growing trend in internationalizing curricula to create both the global physician and/or the universal professional, there is a similar growing trend that is seeing an increase in faculty development programmes, frequently developed by better resourced and educationally more advanced countries, delivered and applied to less well-resourced and educationally disadvantaged ones. Improving patient care has become a priority for all healthcare providers with the overall objective of achieving a high degree of patient safety and satisfaction; the quality of patient care however is determined by the quality of infrastructure, quality of training, competence of individual personnel and efficiency of operational systems. This is further dependent upon effective and up-to-date faculty development. McLean and colleagues in their AMEE guide on faculty development suggested that faculty development is about *"Developing a cadre of professional and competent teachers, educators, researchers and leaders for their new roles and responsibilities in medical education"*. They further emphasized that *"Faculty development is not a luxury. It is an imperative for every medical school ... and should be tailored to suit the needs of individuals, disciplines and the institution"* (McLean et al., 2008). Perhaps an addition to this is now required pertaining to the need to be context and culturally specific to those they serve.

Although faculty development has become a feature in most modernized curricula, there are still schools that place faculty development at a low priority. The Lancet report of 2010 suggested *"The importance of forging new partnerships between the health and education sectors and of continuing professional development of the health workforce"* (Frenk et al., 2010); this partnership now involves many schools and associations creating training opportunities and faculty development programmes in medical education.

Although originally referring to educational programmes, Gibbs' (2006) comments, however, now ring true for faculty development *"We cannot afford to keep 're-inventing the wheel'; we need to make the wheel adaptable to the dynamically changing and real-world environment. We need to design programmes that are not dependent on stability, but are sustainable by adapting to change"* (Gibbs, 2006), suggesting that any interest in training faculty on a global scale must be adaptable to the needs of the country being trained.

Just as educating the Global Physician brings in its opportunities and challenges, training the educators on a global scale brings in other opportunities and challenges, in the areas of cultural, religious, contextual and geographic diversity.

Setting standards



"There have for decades been links from 'developed' countries to poorer 'undeveloped' countries, often initially in postcolonial relations, with the politically more dominant partner setting the agenda, frequently of good academic quality even if initially not responding fully to local context."

Hamilton (2000)

Standards are important in health professions education and Hamilton's previous observations regarding a limited response to context suggest that standards should be dynamic and change to the overall needs of specific countries. Their importance is related to the users of the system; needing to be sure that the health professionals have the knowledge, skills and behavioural qualities they require, being able to safely treat the patients in their care. At a national or local level, the healthcare professional must be able to work within their context, which includes the social, economic and clinical structures within which they work.

Increased travel and migration have led to communities in expecting to receive an equal standard of care, wherever they are, even when the social, economic and clinical structures might be very different. Local standards, whilst important, are no longer sufficient. Reaching an understanding of what are the standards nationally has proved to be very difficult but determining standards that are internationally applicable is exceptionally so.



"The common ground for equivalence in standards must be the academic quality of the intellectual and clinical development of the student. But this, without appropriate application to context, is unfulfilled; so context must be attended to, and it is just as important in developed countries as in others."

Hamilton (2000)

Many, but not all, nations have set up their own regulatory bodies to determine and enforce what is expected from newly graduated doctors. They usually list a series of domains in which competence is required (e.g., [General Medical Council 2015, 2016](#); [Royal College of Physicians and Surgeons of Canada, 2020](#)) and a relatively small number of practical skills that the new graduate should be trusted to perform ([General Medical Council, 2019](#)). In the United States, the emphasis is much more on what is expected of the medical school ([Liaison Committee for Medical Education, 2019](#)); in other words, the procedures and processes, rather than the outcomes. Both approaches are valuable, and one can argue that a medical school that monitors its procedures and protocols carefully to recognized standards will produce doctors that are fit for purpose

and fit for practice.

The World Federation has produced two documents that aim to interpret the standards and guide medical schools that aspire to international recognition for their graduates ([WFME, 2015](#)). This led to the development of standards for those involved in training the teachers on those programmes ([Tekian & Taylor, 2017](#)). In both cases however, it is left to the medical school to define what it expects the competencies of the student or trainee to be.



"History is more or less bunk. It's tradition. We don't want tradition. We want to live in the present and the only history that's worth a tinker's dam is the history we made today."

Henry Ford, 1916

Educational trends and their challenges

An overview of the potential trends and challenges of the internationalization of medical education is given in [Table 7.1](#).

Table 7.1 The trends and challenges of the internationalization of medical education

| Trends | Challenges |
|--|--|
| Expansion of medical school places because of both willingness and technology-enhanced-learning facilities | Resource and financial implications Exceed teaching or clinical teaching capacity Potential lowering of previously accepted standards—money and quantity before quality Virtual reality's limitation on lack of real patient experience |
| Migration of students | Meeting inappropriate standards of selection based upon different values Meeting local needs and accreditation standards Filling a possible gap between educational system and health service system Reducing numbers in home countries through failure to return to home countries Cultural, language and contextual barriers |
| Migration of trained doctors | Meeting local need and accreditation standards Reducing numbers and concern of sustainability in home countries leading to threat to health equity Cultural, language and contextual barriers Failure to address Social Accountability |
| Migration of population and medical tourism | Threats of infectious diseases Threats of lifestyle-related diseases Failure to meet rapidly changing local needs Promoting health and educational equity between different populations without discrimination and stigmatization Financially driven health systems |
| International dimension | Imperialism or colonialism—applying a system that was developed for a different context Lack of co-construction and proper localization |
| Globalized healthcare | Intercultural communication and health systems analysis Developing skills never to be used Overcrowded curricula Lack of clarity of outcomes required |
| Curriculum review and redesign | Quality management Awareness of changing needs Accrediting body awareness |
| Faculty development | Developing specific faculty developers |

| | |
|---|--|
| | Support from leadership Socio-cultural awareness of faculty developers Resource implications Competition with research and service needs |
| Partnerships between institutions | Unequal partnerships, equity and equality Partnerships for financial gain |
| Standardization | Accreditation standards Need for flexible accreditation, capable of adaptation to changing world More local, fewer global accrediting bodies Effective communication between local and global accrediting bodies Step-wise approach to standardization focusing on quality, not quantity and outcomes, rather than processes |
| Change | Sustainability Adaptability and appropriateness Leadership conflict |
| Research in medical education and sharing innovation globally | Research ethical challenge—huge inequalities in global health and medical education |

On the positive side, the insights of a cohort of high-quality world class experts could lead to shared, high quality medical education, boosted through close collaboration with international organizations. In turn this should lead to a cohort of trained medical professionals who are enabled to deal with the health problems that the future may bring. This cohort of professionals would also be well equipped to handle increasing levels of medical tourism, and clinical situations different from the norm.

On the negative side, there is a danger for transplanting a dominant (predominantly Western model) without consideration for the local needs. A curriculum, which is developed to meet the context of a wealthy highly populated urban community, with different disease burdens, is less likely to be sustainable in a poor rural economy.

The issue of migration of the workforce is also significant, because training healthcare professionals to meet the standards required by the international agencies means that they would potentially be able to leave their home countries and practice in regions which they find more appealing (Bundred & Gibbs, 2007; Sharma et al., 2012). This means that countries that are already short of doctors possibly bear the cost of training people to working in more affluent, or less pressured, societies.

The way forward



"If we are together, nothing is impossible. If we are divided, all will fail."

Winston Churchill, 1874—1965

To achieve an excellent standard in the internationalization of medical education, we should be aiming for:

- A vision that will transform education and pursue excellence in medical education for a better health system that meets evolving needs and is adaptive to change in an interdependent and interconnected world. A vision that has clearly defined and agreed outcomes, supported by all stakeholders at international, national, regional and local level.
- A system that places values at the centre of its development. A system that places people at the centre of healthcare and student at the centre of education:
 - Where education is seen as an investment, not an expense, and there is no compromise or trading of poor education for economic development.
 - Where symbiotic relationships exist through cooperation, enabling a flexible flow of knowledge, skills, service, technology, people and capital.
 - Where there is no compromise to the benefit of local patients, population and students, and without any bias based upon class, race, ethnicity, culture and nationalities.
- A locally responsive and globally connected team approach to health, consisting of world class experts in medical education, local and international leaders, faculty members equipped with modernized educational concepts and methodologies working through an interprofessional approach.
- A system that recognizes the Social Accountability of Medical Schools, where the education, research and service commitments remain at the forefront of each individual school's vision, despite the varied international and cultural background of the student. Where motivational mechanisms and political commitment broadly engage leaders, faculties and students to promote excellence in medical education and secure strict implementation.

Summary

The continued internationalization of health professions education is inevitable and exciting but contains many challenges. The sharing of expertise, experiences and resources is both necessary and valuable to staff, students and ultimately patients. Internationalization brings with it a number of challenges in terms of curricula, standards and staffing, but, with consideration and forethought it is possible to reach a vision of shared values and advancement.

References

- Brouwer et al., 2019 Brouwer E, Driessen E, Mamat NH, Nadarajah VD, Somodi K, Frambach J. Educating universal professionals or global physicians? A multi-centre study of international medical programmes design. *Medical Teacher*. 2019;42(2):221–227.
- Bundred and Gibbs, 2007 Bundred P, Gibbs T. Medical migration and Africa: an unwanted legacy of educational change. *Medical Teacher*. 2007;29:893–896.
- Christensen et al., 2015 Christensen C, Raynor ME, McDonald R. *What is disruptive innovation?* Boston: Harvard Business Review; 2015.
- Crisp and Chen, 2014 Crisp N, Chen L. Global supply of health professionals. *New England Journal of Medicine*. 2014;370(10):950–957.
- Crone and Samaan, 2013 Crone RK, Samaan JS. The globalization of medical education. *Innovations in Global Medical and Health Education*. 2013;2013:2.
- Frenk et al., 2010 Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet*. 2010;376(9756):1923–1958.
- General Medical Council, 2015 General Medical Council. (2015). Promoting excellence: standards for medical education and training. Retrieved from http://www.gmc-uk.org/Promoting_excellence_standards_for_medical_education_and Accessed 30/01/2020.
- General Medical Council, 2016 General Medical Council. (2016). Outcomes for Graduates (Tomorrows Doctors). Retrieved from https://www.gmc-uk.org/-/media/documents/outcomes-for-graduates-jul-15-1216_pdf-61408029.pdf. Accessed 30/01/2020.
- General Medical Council, 2019 General Medical Council. (2019). Practical Skills and Procedures. Retrieved from <https://www.gmc-uk.org/education/standards-guidance-and-curricula/standards-and-outcomes/outcomes-for-graduates/practical-skills-and-procedures>. Accessed 30/01/2020.
- Gibbs, 2006 Gibbs T. 'Built to last?': the long-term sustainability of educational programmes. *Medical Teacher*. 2006;25(8):673–674.
- Hamilton, 2000 Hamilton JD. Editorial. International standards of medical education: a global responsibility *Medical Teacher*. 2000;22(6):547–548.
- Ho et al., 2017 Ho MJ, Abbas J, Ahn D, Lai CW, Nara N, Shaw K. The

- “glocalization” of medical school accreditation: case studies from Taiwan, South Korea, and Japan. *Academic Medicine*. 2017;92(12):1715–1722.
- [Kanter, 2008](#) Kanter S. Global health is more important in a smaller world. *Academic Medicine*. 2008;83(2):115–116.
- [Karle, 2007](#) Karle H. International recognition of basic medical education programmes. *Medical Education*. 2007;42(1):12–17.
- [Leask, 2015](#) Leask B. *Internationalizing the curriculum* London: Routledge; 2015.
- [Lemoine et al., 2017](#) Lemoine PA, Hackett PT, Richardson MD. Global higher education and VUCA – Volatility, uncertainty, complexity, ambiguity. In: Mukerji S, Tripathi P, eds. *Handbook of research on administration, policy, and leadership in higher education*. Hershey (PA): IGI Global; 2017;549–568.
- [Liaison Committee on Medical Education, 2019](#) Liaison Committee on Medical Education. (2019). Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to the MD Degree. Retrieved from https://lcme.org/wp-content/uploads/filebase/standards/2020-21_Functions-and-Structure_2019-10-04.docx. Accessed 30/01/2020.
- [Martimianakis and Hafferty, 2013](#) Martimianakis MA, Hafferty FW. The world as the new local clinic: a critical analysis of three discourses of global medical competency. *Social Science and Medicine*. 2013;87:31–38.
- [McKimm and McLean, 2011](#) McKimm J, McLean M. Developing a global health practitioner: time to act?. *Medical Teacher*. 2011;33(8):626–631.
- [McLean et al., 2008](#) McLean M, Cilliers F, Wyk JM. Faculty development: yesterday, today and tomorrow. *Medical Teacher*. 2008;30(6):555–584.
- [Organisation for Economic Co-operation and Development \(OECD\), 2019](#) Organisation for Economic Co-operation and Development (OECD). (2019) Health at a Glance 2019. Retrieved from https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2019_4dd50c09-en, February 2020.
- [Organisation for Economic Co-operation and Development \(OECD\), 2004](#) Organisation for Economic Co-operation and Development (OECD). (2004). Internationalization of Higher Education: policy brief, Organisation for Economic Co-operation and Development Observer.
- [Prideaux, 2019](#) Prideaux D. The global–local tension in medical education:

turning 'think global, act local' on its head?. *Medical Education*. 2019;53(1):25–31.

Royal College of Physicians and Surgeons of Canada, 2020 Royal College of Physicians and Surgeons of Canada. (2020). CanMEDS: Better standards. Retrieved from <http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e>. Accessed 30/01/2020.

Sharma et al., 2012 Sharma A, Lambert TW, Goldacre MJ. Why UK-trained doctors leave the UK: cross-sectional survey of doctors in New Zealand. *Journal of the Royal Society of Medicine*. 2012;105:25–34.

Tekian and Taylor, 2017 Tekian A, Taylor D. Master's Degrees: meeting the standards for medical and health professions education. *Medical Teacher*. 2017;39(9):906–913.

Waterval et al., 2015 Waterval DGJ, Frambach JM, Driessen EW, Scherpbier A. Copy but not paste A literature review of crossborder curriculum partnerships. *Journal of Studies of International Education*. 2015;19(1):65–85.

WHO and UNICEF, 2018 WHO, UNICEF. *A vision for primary health care in the 21st century: towards universal health coverage and the Sustainable Development Goals* Geneva: World Health Organization and the United Nations Children's Fund (UNICEF); 2018.

World Federation for Medical Education, 2015 World Federation for Medical Education. (2015). Basic Medical Education: WFME Global Standards for Quality Improvement: The 2015 revision. Retrieved from <https://wfme.org/standards/bme/>. Accessed 30/01/2020.

World Health Organisation, 1995 World Health Organisation. *Reorientation of medical education and medical practice for health for all. Resolution 48.8* Resolution of the World Health Assembly Geneva: WHO; 1995.

SECTION 2

Learning Situations

OUTLINE

8 How Students Learn

9 Lectures

10 Learning in Small Groups

11 Clinical Teaching

12 Learning in Urban and Rural Communities

13 Learning in Longitudinal Integrated Clerkships

14 Learning in a Simulated Environment

15 Independent Learning and Distance Education

How Students Learn

Heeyoung Han, C Leslie Smith, Boyung Suh, Frank J Papa and Dan Hunt

Trends

- Students should not be perceived as having fixed, stereotyped preferences about how they learn. Diverse worldviews about knowledge and learners help us expand our views on how students learn, which is fundamental for meaningful medical education.
- Grounded on what they ought to learn, students use multifaceted learning strategies, such as mastery, inductive, deductive, self-directed, critical self-reflection, deliberate practice, group-based and informal learning.
- Given the dynamic nature of how students learn, educational practice should evolve to embrace an inclusive learning environment.

Key concepts

- Positivism: a worldview that there is an absolute and observable truth, which becomes a basis of scientific inquiry for knowledge.
- Constructivism: a worldview that rejects the absoluteness of truth and supports individuals' experience and interpretation of the world become a crucial part of knowledge.
- Inductive learning: a learning approach and process where learners start their observation and experience, which result in discovering general rules.
- Deductive learning: a learning approach and process where learners are given general rules and expected to apply the rules to a situation.

Introduction

Learning is an essential instrument for navigating through and interacting with one's environment. Learning, the act of acquiring knowledge and changing behaviours and thoughts, is a ubiquitous and dynamic human behaviour and social process. However, when learning—including medical training—became institutionalized in the 19th century, schools became the centrepiece of formal learning, and the process of learning was systematized and simplified. Yet, learning remains an expansive undertaking that extends beyond traditional classroom methods, particularly in medical education.

Assumptions around learning

Before understanding how students learn, it is necessary to examine two concepts: the object and subject of learning ([Thayer-Bacon, 2013](#)). What is the object that students should learn? Who is the subject doing the learning? These two concepts become the basis for all learning theories that explicate how people learn. Educators may assume that there is a shared understanding of who students (subjects) are, as well as what they ought to learn (object). Upon closer inspection, it becomes apparent that the assumptions may vary. Let us begin to peel away some assumptions.

The object of learning

One could argue that students should learn facts, truth, and reality because they constitute the necessary foundations of knowledge, skills, and attitudes. But what are the facts, truth and reality?

One assumption is that truths are fixed in all contexts and exist externally and independently from individuals. Consequently, students need to acquire these truths for their knowledge. Let us take the example of pathology in medical education. Type I diabetes mellitus (T1DM) is caused by insulin cells not secreting insulin; this is understood as an absolute truth and reality that students should absorb and remember. In this paradigm of 'positivism,' students are often expected to learn the abstracted facts without concrete experiences.

As students progress in their studies and experience real patient care, they will contextualize their learning about T1DM. Students observe that patients' development, symptoms and treatment of T1DM varies. Students may see patients who require an insulin pump and suffer from peripheral neuropathy whereas other patients may self-inject their insulin on a regular basis and have retinopathy. T1DM can be a life-threatening disease for those without the means to purchase their insulin or a chronic yet treatable illness for those with the means. Each of these patient circumstances represent multiple realities and help students diversify their understanding of T1DM in various contexts.

In this example, students' knowledge is created from contextualized reality and developed from personal interactions. This perspective is called 'constructivism'. Constructivism holds that individuals' experience and interpretation become a crucial part in constructing knowledge. As our views on truth and reality expand from positivism to constructivism, we can embrace diverse worldviews on knowledge and how people learn.

If what defines knowledge is fluid and situational, what and how students learn should reflect that fluctuation and contextualization. For example, given the fast-changing nature of pharmacology with many drugs becoming outdated within a few years and plethora of easily available drug information, memorizing vast quantities of specific drug information becomes an inefficient learning activity. Instead, the students' learning object should be their ability to critically evaluate information, conceptualize

principles, and develop a lifelong learning orientation. Rather than rote memorization, active exploration and evaluation of information become the modalities of attaining these learning objects. Because educational context constantly evolves, we should continually reevaluate our collective beliefs about the object of learning and how students learn.

The subject of learning

Other fundamental assumptions that we need to investigate are those surrounding ‘the subject’ — whose beliefs about knowing matters — and whether there is one universal view on how people learn, irrespective of individual differences.

Existing views on knowledge and knowing have been critiqued because they are primarily based on Western (mostly American) white, male learners’ views, rather than from expanded diverse cultural views (Hofer, 2008). Clearly, the culture, environment, and individual characteristics of a student affect their learning experiences. For example, Asian students’ beliefs about knowledge and knowing are different from Western students’ beliefs (Hofer, 2008). Minority students may need more considerate psychosocial support in an environment where they may not feel a sense of belonging. Learner diversity demands that we pay attention to these diverse views on knowledge and knowing, rather than treating them as constant and universal.



Tip

Our understanding of how students learn depends on our assumptions about knowledge (object) and learners (subject).

This chapter covers our current understanding about knowledge and learners because those two concepts drive an understanding of how students learn. In the following sections, we explore multiple definitions of learning, learning theories and strategies. Then we will discuss learners’ difference in their learning experiences through learning styles, approaches and context.

Multiple definitions of learning

How people learn has been understood based on several perspectives. Learning is defined as: (1) a behavioural change observed, (2) an internal cognitive schema change and (3) the reflective practice of constructing knowledge contextualized within social and cultural contexts ([Schunk, 2020](#)).

Learning as an observable and measurable behavioural change

Advocates of this view emphasize the role of the conditioning environment. This environment includes the stimulus and the positive and negative reinforcement. The instructional process includes observation and objective measurement that facilitate the acquisition of desired behaviours in students' behaviours.

Learning as internal changes in students' cognitive schema

This paradigm is also interested in observed changes in behaviours. But proponents argue that the changed behaviour results from an individual's internal information processing, not from a stimulus or response. According to this view, information given to learners is processed in short-term memory and stored in long-term memory, just like a computer system. Because learners' short-term memory space is limited, they process information by adopting several cognitive and metacognitive strategies. These strategies include chunking, organizing and using pictorial images to facilitate information retention, and recall from their long-term memory.

Learning as an individual's contextualized knowledge creation

The two prior paradigms assume that knowledge is an entity separate and discrete from learners who acquire knowledge through behavioural changes or cognitive information processing. In contrast, proponents of this paradigm argue that knowledge does not exist independently from learners. Rather than being passive receivers of knowledge, learners actively create knowledge through their individualized intimate experiences and reflections within a context. Further, social interactions and social and cultural contexts of origin influence student learning.

Most learning theories explain how students learn based on one or more of these three paradigms. Let us look at how learning theories further explain students' learning.



Tip

Learning is learners'

- Change in their behaviour.

- Change in their cognition.

- Creation of their own knowledge in a social and cultural context.

Learning theories and strategies

Numerous theories have attempted to describe and explain how students learn. These theories have put forward that learning results from informal, day-to-day experiences, such as clinical rounds, from self-directed and intentional acts, such as studying independently, and/or from formalized training programmes, such as scheduled, didactic lectures. Consequently, these theories and paradigms have postulated different types of learning strategies ([Box 8.1](#)). Below are some examples of learning strategies, based on multiple perspectives on learning.

Box 8.1

Learning strategies

- Students learn by mastering each stage of learning processes.
- Students learn inductively, as well as deductively.
- Students direct their learning.
- Students' self-reflection is critical in their experiential learning process.
- Students learn from deficiencies and mistakes through deliberate practice.
- Students learn through interacting with others in a group setting.
- Students learn in a community of practice.
- Students learn during real patient care.
- Students learn beyond the formal curriculum, which is often called 'informal learning.'

Students learn by mastering each stage of learning processes

There are multiple stages in acquiring complex knowledge. Students need to master each stage as a prerequisite to progressing to the next stage of understanding. For example, to understand the best treatment of a diabetic patient, students need to first understand the mechanism of how carbohydrates are metabolized and then subsequently what impact each treatment option would have on the mechanism ([Abrose et al., 2017](#)). This learning also requires the students to first create a foundation of knowledge and then build on that foundation. Without solid understanding of the prerequisites, students struggle to acquire the desired complex learning.

Students become 'proficient' as they master required learning and apply it to complex tasks. Their capacity to perform complex tasks becomes increasingly automated as they continue to build on their foundation and become competent. For example, over time, clinical experts become less conscious about all the prerequisites they attained (forgetting the foundational biochemistry) and subsequently develop shortcuts for

performance. This explains why residents are sometimes better teachers for medical students than the more experienced clinician with expert blind spots.

Mastering a competence is not necessarily a linear but is more commonly an iterative process. Students' ability to self-identify learning gaps is a critical learning object to stay up to date as clinicians. Students identify their learning gaps deductively and inductively, which will be discussed in detail later.

Students learn inductively as well as deductively

In deductive learning, experts explicate complex concepts, break down tasks into simpler parts, and provide a well-structured information set for students. Students learn from general rules and abstracted examples by following steps provided by experts. Students take a test to monitor their understanding of the general concepts. Then when they see a patient, they retrieve the different sets of stored information and apply it to the complex task of patient care. However, students' memory of the general information may be limited or incorrect. Further they may inappropriately apply details learned in 'case A' to a broader context of the pathology (case B, C and D) when in fact they were relevant only to the initial situation (case A). The application of learning to real-world problems can be challenging because of a lack of contextual cues for the generalizability.

By contrast, inductive learning approaches, such as a problem-based learning (PBL) or experiential learning, allow students to learn through a real world, meaningful patient case. The ability to navigate the complexity of 'real medicine' is also a type of knowledge that students acquire in inductive learning. Actively identifying their own learning gaps is emphasized in this type of learning. This prepares them for the lifelong task of learning that will be a part of their clinical careers. In this way, students experience what it is like to be a clinician and to acquire general rules and principles about diseases in the context of a specific patient situation.

Deductive and inductive learning are both relevant to developing diagnostic reasoning, one of the most necessary skills that medical students learn. Learning sciences research suggests that diagnostic reasoning should no longer be considered hypotheticodeductive reasoning. Rather, reasoning is a categorization task which largely involves 'ill-defined' categories (i.e., diseases not reliably diagnosed at the bedside as they lack symptoms and sufficient diagnostic criteria). Diagnostic reasoning requires the development of two distinct intellectual skills: (1) analogic skills (reasoning via pattern matching), and (2) analytical skills (reasoning involving numerically based estimates representing the probability that one disease is more likely than competing diseases). Learning approaches may be conceptualized by an evolving understanding of how healthcare providers perform differential diagnosis within dual processing theories ([Papa, 2016](#)).

Students direct their learning

Students can direct and regulate their own learning processes ([Merriam et al., 2006](#)). In self-directed learning, students do not learn simply because someone teaches or tells

them what to study. Students learn more significantly when they take ownership of and are motivated in their learning. Self-directed learning involves critical iterative stages. It includes building a learning climate, identifying learning needs and goals, planning and developing competency profiles, implementing cognitive learning strategies, identifying resources including social resources, managing learning environments, managing motivation and emotion, and monitoring learning process and outcomes. This notion of self-directed learning becomes students' learning skills.

Students learn and transform through critical self-reflection

Medical students are adult learners. They transform their prior worldviews and identities imposed by others in their youth as they make meaning out of their own actual experiences. Transformative learning can be very powerful but requires students' critical self-reflection on their taken-for-granted perspectives when they encounter experiences dissimilar to their own ([Merriam et al., 2006](#)). For example, in a classroom, students learn the pathogenesis of asthma. As they become involved in community service learning, they experience structural poverty and injustice that perpetuate asthma for certain populations. With critical self-reflection on the experience, students may remodel their career identity from solely a physician to a physician who is an active advocate focused on changing the social determinants of health.

Although critical self-reflection is hard to impose as an educator, there are some ways to facilitate students' reflection process. These process methods include selecting an incident that is dissimilar to an existing belief, interpreting the incident, reflecting on the lessons learned, personalizing the meaning and connecting the meaning to a future action ([Merriam et al., 2006](#)).

Students learn from deficiencies and mistakes through deliberate practice

Students develop professional expertise in large part through deliberate practice ([Ericsson, 2004](#)). Unfortunately, deliberate practice is often misunderstood as simple repetition of a practice, such as 10,000 hours of piano playing. Although putting in the time is fundamental, the focus should be on revisiting deficiencies or areas of struggle until the desired learning and performance goals are met. As deficiencies are addressed, students begin to transition to mastery and can perform a complex skill without significant cognitive attention. This automaticity cannot be achieved without metacognitive monitoring and deliberate practice on the struggles.

Deliberate learning typically occurs within a structured educational environment that continuously provides novice students coaching feedback and guidance through a series of carefully designed, managed and assessed learning activities. Acquisition of a surgical skill (e.g., laparoscopic vascular suturing) is an example of deliberate deep learning in medical education. Students who aim to acquire expert performance within a certain competency area can attain it by: (1) identifying a specific task domain for

improvement, (2) getting instant and detailed feedback on job performance from a trainer with expertise and (3) repeatedly performing a job task over time ([Ericsson, 2004](#)).

Students learn through interacting with others in a group setting

Students' interaction with peers and teachers in a group-learning environment allows them to collectively explore diverse perspectives and close knowledge gaps. In this setting, students learn more meaningfully when the group creates a safe learning culture and all group members agree to contribute to the collective learning process. The ability to function as a team and the development of collaborative skills and professionalism are part of the learning goals in these settings.

Most medical schools in the United States have adopted group-based learning strategies into their curricula, such as PBL and team-based learning. Students in a group learning environment demonstrate the ownership of their learning by actively contributing to the group process, as well as engaging in their individual, self-directed learning process ([Hawkins, 2014](#)). When done effectively, the individual students acquire not only basic science knowledge and clinical reasoning skills, but also and invaluable team collaboration skills.

Students learn in a community of practice

Learning in larger settings (e.g., an organization, a community) is another developmental opportunity for students. One example of this learning process is communities of practice (CoP). People with common interest join or form a CoP within an organization, and they collectively learn about common topics or seek wisdom to solve a real-life problem by sharing members' experiences and offering support. Students' participation in a national organization of global health or an interdisciplinary patient care initiative can help them acquire organizational levels of knowledge, such as methods of collaboration behind a common mission.

Students learn by participating in real patient care

Students' actual participation in a real patient care drives meaningful learning experiences that may not be acquired in classroom learning. To participate, students need to be situated and socialized in a patient care setting, which is why medical students are sent to clinical sites during medical training. In the beginning, students may remain peripheral to the central work of the team, but as they develop as clinicians, their role may become more central. As their level of participation shifts, students also learn group norms and unwritten rules that matter for the team's work ([Han et al., 2015](#)). Without actual participation in an authentic practice, this kind of knowledge is largely invisible to students.

Students learn beyond the formal curriculum via ‘informal learning’

Students observe and interact with a variety of environments and will consciously or unconsciously pick up some behaviours or attitudes, even though these behaviours and attitudes are not a part of the formal curriculum. For example, if students observe a physician demonstrating respect to a patient or staff member, students would learn to emulate that behaviour through role modelling. Conversely, if a student observes unprofessional behaviour and the school or surrounding clinicians do not actively discourage it, the student may learn that it is acceptable to be unprofessional. Students’ professional behaviours and attitudes can therefore be shaped by their perceptions and observations during informal learning experiences. This is often called the ‘hidden curriculum’ in medical education, covered in more detail in [Chapter 6](#) of this book.

In most of the learning theories discussed earlier, learners are treated as a group or population with generalizable and homogeneous cognitive and behavioural learning processes. From this perspective, most educators would assume that the learning environment is equally adequate for all students. However, students are quite different and their approaches to the learning process are not uniform. In the following sections, we will review the criticism of learning styles and further learners’ different approaches to and situations of learning.

Learning styles

Appreciation of learners' differences has enhanced our understanding of how students learn. The notion that students learn differently and have a 'style' of learning (Newble & Entwistle, 1986) implies that the learner has a relatively stable method of information acquisition based on their cognitive traits and personality characteristics. Unfortunately, this perspective led instructors and learners to stereotype students into a certain style of learning, which was not in fact supported by educational research.

According to Curry (1983), learning styles can be described in relation to the depth of character penetration. She analyzed 21 instruments that hypothetically measured learning styles and grouped them according to layers, creating an 'onion model' of learning styles. Curry postulated that the deepest layer of learning styles is influenced by 'cognitive personality' style and is not impacted by the learning environment (e.g., Myers-Briggs personality type). The middle layer is concerned with 'information processing' style and includes such examples as Kolb's Learning Style Inventory (i.e., concrete, abstract, reflective and active). The outer layer is focused on 'instructional preference' (e.g., visual, auditory, kinesthetic learning styles) and is most influenced by the learning environment (lecture, small group, etc.). The idea that style of learning would be relatively fixed for the learner led to the assertion that instruction should be customized to meet the needs of the learners and facilitate their learning according to the student's learning style.

More recent literature, however, has argued against this idea. Learning style instruments were not empirically scrutinized—the instruments were not measuring what they purported to measure—and the few studies that were using valid, reliable tools demonstrated largely negative findings (Coffield et al., 2004). In addition, there was no evidence to support the idea that the use of a learning style had an effect on learning outcomes. Finally, the question arose as to whether a learning style could exist outside of the context of the learning environment. Hence, a reexamination of the assumption that learners are different in their style of learning was appropriate.



Tip

Learning styles are theoretically hardwired into a person's psychologic make-up, but the concept has been largely debunked. Learning approaches are used by learners depending on the contextual environment of their learning and their motivation for learning.

Learning approaches and contexts

How, then, do students differ in how they learn? Students exercise different approaches to learning depending on the context of the learning, the instruction or guidance of a teacher or facilitator and the method and frequency of assessment. These approaches to learning may be delineated into three groups: surface, deep and strategic.

Learners who are motivated to fulfil the minimum requirements of a course and thereby avoid failure use the surface approach. Rote memorization is a commonly used technique. Those who can memorize large amounts of material may accumulate considerable information about a subject, but their understanding often remains relatively superficial. These learners are termed 'surface active' students. 'Surface passive' learners do not attempt to learn as much as their counterparts; hence the facts they retain are often disjointed, and their understanding is superficial. Depending on the method of assessment, surface active students may be able to pass the course requirements because of their ability to regurgitate memorized material. Surface passive students, however, may struggle to pass examinations as they have a smaller bank of knowledge on the subject from which to extract information in an assessment situation.

Deep approach learners are inspired by understanding and often motivated to see the clinical application of the material. These students are interested in making connections between new and familiar material; hence their understanding of the material is more comprehensive. Deep learners use a stepwise approach and, after attending to all relevant details, gradually accept generalizations. They also often use rote memorization but use it to create connections and understanding. Deep learners begin with generalizations and then use details to fill in their understanding of a topic, focusing on comprehension. These students tend to prioritize personal meaning and analogy to facilitate memorization of facts. Versatile deep approach students pivot between using details first and then the generalizations, or the generalizations first and then the details.

Intuitively, one might think that deep approach students would be automatically successful medical learners, but this is not necessarily the case. Because understanding motivates them and the volume of medical facts is so monumental, these learners may not be able to subsume the massive volume of medical knowledge to their desired level of comprehension. Many assessment tools measure facts rather than understanding, hence they may not be successful in all assessment contexts.

Students who tend to be most successful at the university level are those who use a strategic approach, which uses both surface and deep learning approaches to achieve the best learning outcomes depending on learning tasks. Depending on the context and assessment instruments, these learners use a variety of approaches for study. These choices are based on the techniques and topics that they calculate will offer the highest probability of success. They tailor their study to the subjects with the highest likelihood of a good return on their investment of time and attention. They are less motivated by understanding and more interested in ensuring achievement. Because of this, their comprehension is sometimes lacking, but they tend to be successful on course

assessments.

Many studies have demonstrated that students can change their learning approaches over time ([Feeley & Biggerstaff, 2015](#)). Often students enter medical education with a more surface approach but realize that this is not vocationally helpful and adopt deep or strategic approaches to learning.

Given this, we cannot assume that an instructional intervention will provide the same quality or type of learning with all students within a diverse student body. In addition, because an assessment (e.g., a standardized multiple-choice test) is often biased towards a certain student population, using only one method of evaluation will provide only limited understanding of students' diverse learning experiences and ability to demonstrate that knowledge. Even when using the same learning approaches and having similar formal contacts with teachers, minority college students complete fewer college credits and achieve lower grades than majority students ([Severiens & Wolff, 2008](#)). Students have different backgrounds from prior school experiences, psychosocial factors, and diversity culture that significantly influence on their learning experiences. The same educational environment or instruction can lead to different learning mechanisms and effects based on the context of each individual student. Therefore educational practices and environments should evolve to embrace students' diverse experiences of learning.



Tip

Educational practices and environments should evolve to embrace students' diverse approaches to and experiences of learning.

Summary

Understanding how students learn is a developmental journey of educators to discover and comprehend what constitutes knowledge and how we get to know it. Learning is a complex social activity based on our collective belief on what should be taught and who students are. Based on multiple worldviews, students' learning has been understood as behavioural, cognitive and experiential changes and various learning theories and strategies emerged from the continuum of these different worldviews. They collectively provide our contemporary understanding of how students learn. As our understanding of how students learn evolves to become more inclusive, medical education will evolve to better meet the needs of diverse learners and a diverse society.

References

- Abrose et al., 2017 Abrose S, Waechter D, Hunt D. Student engagement in learning. In: Dent J, Harden RM, Hunt D, eds. *A practical guide for medical teachers*. UK: Elsevier; 2017;339–344.
- Coffield et al., 2004 Coffield, F., Moseley, D., Hall, E., Ecclestone, K. (2004). *Learning styles and pedagogy in post-16 learning: a systematic and critical review*. Retrieved from <http://hdl.voced.edu.au/10707/69027>.
- Curry, 1983 Curry L. Patterns of learning style across selected medical specialties. *Educational Psychology*. 1983;11(3–4):247–277.
- Ericsson, 2004 Ericsson KA. Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Academic Medicine*. 2004;79(10):S70–S81.
- Feeley and Biggerstaff, 2015 Feeley AM, Biggerstaff DL. Examination success at undergraduate and graduate-entry medical schools: is learning style or learning approach more important? A critical review exploring links between academic success, learning styles, and learning approaches among school-leaver entry (“traditional”) and graduate-entry (“nontraditional”) medical students. *Teaching & Learning in Medicine*. 2015;27:237–244.
- Han et al., 2015 Han H, Roberts NK, Korte R. Learning in the real place: medical students' learning and socialization in clerkships at one medical school. *Academic Medicine*. 2015;90(2):231–239.
- Hawkins, 2014 Hawkins D. *A team-based learning guide for faculty in the health professions* Bloomington, IN, USA: Author-House; 2014.
- Hofer, 2008 Hofer BK. Personal epistemology and culture. In: Khine MS, ed. *Knowing, knowledge and beliefs: epistemological studies diverse culture*. Netherlands: Springer; 2008;3–22.
- Merriam et al., 2006 Merriam SB, Caffarella RS, Baumgartner LM. *Learning in adulthood: a comprehensive guide* 3rd ed. San Francisco, CA, USA: John Wiley & Sons; 2006.
- Newble and Entwistle, 1986 Newble DI, Entwistle NJ. Learning styles and approaches: implications for medical education. *Medical Education*. 1986;20(3):162–175.
- Papa, 2016 Papa FJ. A dual processing theory based approach to instruction and assessment of diagnostic competencies. *Medical Science Educator*. 2016;26(4):787–795.
- Schunk, 2020 Schunk DH. *Learning theories: an educational perspective* 8th ed.

Hoboken, NJ, USA: Pearson; 2020.

[Severiens and Wolff, 2008](#) Severiens S, Wolff R. A comparison of ethnic minority and majority students: social and academic integration, and quality of learning. *Studies in Higher Education*. 2008;33(3):253–266.

[Thayer-Bacon, 2013](#) Thayer-Bacon B. Epistemology and education. In: Irby BJ, Brown G, Lara-Alecio R, Jackson S, eds. *The handbook of educational theories*. Charlotte, NC, USA: Information Age Publishing; 2013;17–27.

Lectures

William B Jeffries III., Kathryn N Huggett and John L Szarek

Trends

- Recognition that the role of lectures is changing because of technology and new evidence about learning.
- Improved understanding of lecture as a knowledge construction event.
- Increased appreciation for lectures as opportunities for active participation and engagement.
- Preparing for lectures now requires planning for the asynchronous participation of learners who access recorded lectures.
- Learning may now begin before lecture, with application and clarification during the assigned lecture time.

Key concepts

- Lecture: a teaching method in which factual information is transmitted to a large, usually passive, audience.
- Modified lecture: a teaching method in which elements of active learning replace portions of a typical lecture session.
- Flipped classroom: a teaching method in which the typical lecture and homework elements of a course are reversed.

Lectures in medical teaching



“LECTURE: a discourse given before an audience upon a given subject, usually for the purpose of instruction.”

Oxford English Dictionary

Introduction

Lectures have been used for several centuries but their utility is under scrutiny because of growing neurobiological evidence regarding learning. Moreover, lectures are under challenge from competing pedagogies, often enabled by digital technology. Regardless, lectures remain a widespread teaching method. This chapter will provide teachers of health sciences with the rationale and methods for lecture success and better learning outcomes by enhancing active learning.

Pros and cons of lectures as a primary learning event

Excellent lecturers captivate students with their stories and wisdom, and most students and faculty expect them to be an integral part of knowledge acquisition and inspiration. It is thus unsurprising that students prefer in-person lectures versus recorded lectures (Bligh, 2000). Teachers prefer lecturing because it is an efficient method to transfer information to the learner and students often prefer it because it predicts the coming summative assessment. Box 9.1 lists some important ways that lectures can be effective.

Box 9.1

Effective uses of lectures

- Presenting up-to-date information.
- Summarizing material from multiple sources.
- Helping students prepare for active learning by providing an orientation and conceptual framework.
- Focusing on key concepts, core principles or ideas.

Modified from Svinicki & McKeachie, 2013; Jeffries & Huggett, 2014.

Individual and pedagogic limitations, however, interfere with the effective use of lectures in learning in a health sciences curriculum. Among individual limitations, we have found a wide variance in lecturer presentation skills, confidence, subject knowledge, pedagogic experience and engagement. Deficits here limit learning and undermine student enthusiasm and perception of faculty charisma. For faculty, these deficits can lead to fear, lack of fulfilment and negative ratings from learners.

The perception that lectures are an effective and efficient way to transfer information, even though other pedagogies are superior, makes pedagogic limitations harder to overcome. A growing body of evidence reveals that the traditional lecture is not optimal for development of skills and attitudes and higher levels of knowledge application needed for excellent healthcare providers. Proficient lecturers are essential for health sciences teaching, but the lectures should be used judiciously.



Tip

Before preparing a lecture make sure that it is the most appropriate format for the learning outcome desired. Another modality might be superior.

Learning in a lecture environment

Constructivist Learning Theory is a useful framework to understand knowledge acquisition during lecture (see [Torre et al., 2006](#) for a review of major learning theories for medical education). In constructivism, learners develop and modify prior knowledge by constructing meaning from new experiences. During lecture, the teacher presents material which students interpret, compare to existing knowledge, and create new meaning (integrated with previously assimilated material). To be an effective experience, teachers need to maintain learner attention, foster engagement, promote retention and project effective organization.

Attention in lecture

Learner attention is maintained by arousal and motivation. Arousal reflects the overall energy level of learners, whereas motivation refers to energy directed to specific goals ([Bligh, 2000](#)). Arousal is maintained through variations in stimulation (presentation style, learning activities, audiovisual material) and environmental factors (seating, temperature, lighting). No more than 10 to 15 minutes should pass without some active effort to boost arousal ([Jeffries, 2014](#)). [Box 9.2](#) includes some ideas to accomplish this.

Box 9.2

Tips to maintain arousal in lectures

- Vary the visual presentation (include photos, charts, etc.).
- Vary delivery pace and vocal tone. Do not read slides but use them as a basis for engaging descriptions and anecdotes.
- Introduce a 'respite' in the lecture. Stop lecturing for 1 minute or less and get students to interact.
- Do something unexpected (introduce a patient, perform a demonstration, watch a video, etc.). This change resets arousal to a higher level, promoting retention.
- Optimize the learning environment. Limit distracting noise, conversation and unnecessary use of electronic devices. Assure proper lighting (not too dim), seating, air circulation and temperature. Avoid postprandial and late afternoon lectures that can reduce arousal.

Motivation is important in maintaining attention and can be intrinsic and extrinsic. The intrinsic motivations of students are both immediate (e.g., knowledge acquisition for the coming assessment) and far reaching (e.g., relevance to their medical careers). To foster intrinsic motivation, clearly outline the content relevance to course objectives and its assessments, to nationally normed comprehensive examinations, and to public health. Students are motivated extrinsically when they hear the phrase 'this will be on

the test!’

Fostering engagement

Instructor engagement promotes student attention. Students respond best to instructors who are knowledgeable, organized, professional, enthusiastic, and explain the relevance of content to current practice. Students also value instructors who link their prior coursework to current lecture content ([Onwuegbuzie et al., 2007](#)).

Start each session by introducing yourself, the topic and its relation to the course objectives. The presentation’s organization should be transparent, with time designated for questions and summing up. Move away from the podium to interact directly with the learners, make eye contact and gauge their interest and enthusiasm. Use audiovisual materials to tell compelling stories, introduce helpful mnemonics and ask provocative questions. To ensure that learners are not confused or disengaged, periodically ask short questions that can be answered via an audience response system or a show of hands. Humour is appreciated and can raise attention but assure that it is culturally and generationally sensitive. Stories are more effective when they relate directly to the context of the subject; interesting yet extraneous information decreases learning of relevant information ([Mayer et al., 2008](#)). End by summing up the salient major points and stay after the session to answer questions.



Tip

Arrive early to the session to chat with students, become familiar with the room and its facilities and ensure that the audiovisual materials are working properly.

Promoting retention

Retention combines the effective encoding of knowledge (through instruction, studying, reflection and creation of meaning) and effective retrieval of that knowledge (which is measured on assessments). Of the many factors that influence retention, there are four practical components that are under the lecturer’s control: content density, pacing, note taking and retrieval practice.

Mismanagement of content density in a lecture is a common mistake. Too much content creates a cognitive load that is too high. In this setting, students will have great difficulty prioritizing important points, will gain only superficial knowledge or may abandon attempts to learn the material altogether. Cognitive processing of information and the creation of an ‘internal narrative’ by the learner will be impaired. Content overload leads to errors in pacing.

Proper pacing promotes retention. To maximize retention, the material must be delivered at an appropriate pace such that students can process it from short-term memory into their existing long-term memory (rehearsal) and/or by constructing new meaning. If the pace is too fast, the student will be overwhelmed because of

interference, and learning will cease. Conversely, if the pace is too slow, learning may also cease because of decreased arousal with loss of attention. As a start, plan no more than 2 to 3 minutes per slide, and build in time for questions and a summary. Pacing is an important consideration when reviewing evaluations to iteratively improve the lecture and course.



Tip

The most common mistake made by lecturers is the inclusion of too much information. Focus on major points with a few salient examples.

Note taking promotes learning and improves retention (Bligh, 2000) but pacing needs to be slow enough to allow effective note taking. The instructor should closely follow the outline, emphasizing the important points through examples, summaries and reiteration. Handouts not only help organize the lecture and provide relevant data, but they engage learners in active work while note taking. Pause the presentation periodically to allow students to catch up, reflect and generate questions. This pause can be turned into an active learning exercise, as discussed later.



“Retrieval is not merely a readout of the knowledge stored in one’s mind; the act of reconstructing knowledge itself enhances learning.”

Karpicke and Blunt (2011)

Retrieval practice significantly enhances the learning process and the repeated reconstruction of knowledge produces important learning gains superior to that of other study methods (Karpicke & Blunt, 2011). These findings were foreshadowed by those of Jones (1923, summarized by Bligh 2000), who found that the decay of knowledge learned in lectures was considerably blunted by immediate testing. Based on these data, we advocate the inclusion of retrieval practice within, or at the end of each lecture. This can be accomplished with short answer examinations on paper or introduced via an audience response system. Box 9.3 summarizes some considerations to promote retention.

Box 9.3

Tips to promote retention

- Control the density of content to encompass a few major points.
- Create handout materials that encourage effective note taking.
- Pause after major concepts to allow students to process and formulate questions.

- Embed assessment questions into and/or the end of the lecture.

Organizing a lecture

Successful lectures have a transparent organization that helps learners understand expected outcomes for the session. The purpose of health science lectures often fall into one of four categories (Jeffries, 2014): (1) presentation of information about a specific subject (e.g., drugs used to lower blood pressure); (2) development of critical thinking skills (e.g., how to interpret plasma electrolyte values); (3) demonstration of a procedure, experiment or clinical approach (e.g., surgical approaches to bowel disease); (4) construction of an argument (e.g., prioritization of patients for treatment with scarce resources).



Tip

All lecture types should include clear and measurable learning objectives that guide the presentation as well as the assessment.

Objectives represent another organizing principle for lectures. Objectives should specify behaviours that learners could be observed doing as a result of the session (e.g., 'Based on patient laboratory values, identify common electrolyte abnormalities'). Bloom's taxonomy is helpful in creating objectives and in gauging their needed complexity (Kratwohl, 2002). Objectives should be specific and reflect prior student learning and the scope of the session, but not too numerous as to overload the session.

Once the purpose and objectives are established, organize the lecture based on content and pedagogic efficacy. It is useful to brainstorm all content related to the topic with a concept map or other organizing strategy. This will help in four important areas (Jeffries, 2014):

- Identifying overlaps with other course sessions and with previously learned material. In team-taught courses, determine where your material begins and ends. Avoid unplanned repetition of previously taught material.
- Determining the required depth of learning needed for the learners. Many a promising lecture has gone astray by delving too deeply into minutia.
- Choosing how to organize the material. This may be already determined in a team-taught course, but the organizational structure must be clear and reflected in handout materials.
- Discovering gaps in your own understanding of the topic. Generate a reading list to cover aspects not in your area of expertise. Be familiar with the learner's study materials.

There are many ways to organize the lecture once the aforementioned areas have been addressed. Inductive methods involve using a real-world example, in which facts

are assembled to create a general principle. For example, a story of a viral outbreak could be detailed, the facts of which could be used to examine theories of epidemiology and public health. Deductive methods work in the opposite way, with a discussion of the general principles, followed by examples of their application. In either case, real stories add vividness and clarity that promotes understanding and retention.

Teaching materials

Audiovisuals

Learner understanding is promoted by effective presentation of the underlying outline, clarifying figures and charts, photographs of patient presentation or pathology slides, audience-response questions, etc. It is best to mix formats and media to increase attention. In an electronic format, try to follow some simple guidelines:

- Include only four to five salient points using at least an 18-point font size. Check that figure slides are legible and large as possible.
- Text slides should have a light background and dark letters so that room lights do not need to be dimmed.
- Avoid conflicting formats on the same slide.
- Incorporate instructional elements, such as video, demonstration, questions or audience participation to maximize engagement.

Audience response system

An audience response system (ARS) allows learners to electronically answer multiple-choice questions in class using dedicated devices or the learner's computer or smart device. The ARS can instantly calculate answer frequency, recording group data and conferring anonymity on the responders (if desired). The ARS can be used to great advantage during lectures to:

- Obtain feedback about comprehension identifying points that need to be revisited.
- Provide formative feedback to learners to identify areas of weakness for follow-up.
- Provide retrieval practice, especially for important topics.
- Create a summative or formative quiz.

Lecture recordings

Many institutions record lectures as podcasts (audio only) or videocasts for students to use asynchronously. To promote maximum learning, there are some important considerations to remember when being recorded, which vary with the recording type:

- Podcasting. The remote students must listen to the lecture and simultaneously review the slides. To ensure students stay oriented, number the slides and periodically state which slide you are discussing. The viewers cannot see you point at structures, write on the board, etc. Remember to affix your microphone properly and turn it on. Audience questions will not be audible and should be repeated before answering.

- Videocasting. Slides captured from a video camera in the room have a considerable loss of resolution. The previously discussed guidelines for slide legibility are important here. If the system produces only the slides with instructor voice-over, events that happen off screen, such as writing on the board and in-class demonstrations will not be visible. When pointing at objects on the slides, use the mouse, because a physical or laser pointer will not be visible.

Active learning in the lecture hall



“Active learning is those (practices) designed at least in part to promote conceptual understanding through interactive engagement of students in heads-on (always) and hands-on (usually) activities which yield immediate feedback through discussion with peers and/or instructors.”

Hake (1998)

In active learning, students are required to do something. This can include preparative research, reflective writing, problem-solving and/or group discussion. Most active learning sessions require preparation by the learners and an expectation of higher-level learning outcome than factual recall.

Many studies, including a large metaanalysis, demonstrated superior outcomes from active learning methods versus a traditional lecture format in science courses ([Freeman et al., 2014](#)). These compelling data suggest that active learning methods should be integrated into the curriculum and supplement or supplant the traditional lecture. We consider two ways of accomplishing this: by embedding active learning methods into the traditional lecture and by ‘flipping’ the lecture to encourage a learner-centred experience.

By integrating active learning techniques into the lecture, we transform students from receivers to appliers of knowledge, creating a powerful impetus for deeper learning and retention. Active learning exercises can stimulate application, analysis and evaluation, as described in the Modified Bloom’s Taxonomy. These levels are difficult to achieve in ordinary lectures, however, because students are often experiencing the material for the first time. Thus active learning methods have better results when students are prepared with a reading assignment or other learning activity before the learning session. A modified lecture format encompasses varying amounts of required preparation (or none) with active learning elements interspersed in the session.

Note Check

The easiest way to introduce active learning is with reflective techniques, the simplest of which is Note Check. At various intervals participants are asked to review their notes for 1 to 3 minutes, finding points needing clarification. This encourages reflective thinking and students can be prompted to identify the point of greatest confusion (‘the muddiest point’, [Angelo & Cross, 1993](#)). This can prompt class discussions, student written reflections or *impromptu* clarifying explanations. Note Check also provides a break from the lecture with an accompanying arousal boost and promotes rehearsal of material into long-term memory.

Low stakes writing assignment

During class, students write a short explanation of a lecture or reflect on a reading assignment ([Svinicki & McKeachie, 2013](#)). This forms the basis for subsequent discussion or high stakes writing assignment. The writing clarifies student thinking, improves their writing and enriches discussions. An alternate format, called the 'one-minute paper,' can be adapted to serve similar functions ([Angelo & Cross, 1993](#)).

Think-Pair-Share

In Think-Pair-Share the lecture is paused after an important point and an application question is introduced. Participants briefly (1–3 minutes) think about the answer individually, relying on the lecture information and preparative work. Students then form discussion pairs. Student pairs are then randomly selected to share an answer to the question in a large group discussion. Each pair must be prepared to answer the question if called upon, promoting individual accountability. The responses are summarized by the instructor if conflicting answers are obtained, or a further discussion can be started to resolve outstanding issues. This technique also helps to identify the muddiest points for a large class discussion.



Tip

Learning is improved when students explain their reasoning to others. Foster this advantage by having students learn in groups.

Buzz groups

Buzz groups are the larger cousins of Think-Pair-Share. Buzz groups can be spontaneously formed or preassigned to address assigned tasks. For example, a case is introduced, prompting students to develop a differential diagnosis and/or treatment plan. The best results come when all groups work on the same problem ([Michaelsen et al., 2008](#)). Groups report their findings, and the lecturer sums up the correct answer and provides clarifying explanations. In a variation of this method (Peer Learning), lectures are interspersed with conceptual questions (ConcepTests) that are completed by individual students. Then student groups reach a consensus on the correct answer, facilitated by the instructor ([Fagen et al., 2002](#)).

The modified lecture format is sometimes criticized for reducing the time available for introduction of essential material, because each exercise can take 5 or 10 minutes. However, one must remember that you are trading fact delivery for deep learning. Facts are poorly retained during the average lecture, but meaningful application bolsters retention and learning depth. Thus use active learning exercises for the most important concepts and assign the coverage of displaced facts to the preparation phase.

The flipped classroom

In the flipped classroom, the typical lecture and homework elements of a course are reversed ([Educause, 2012](#)). The 'homework' consists of factual material that is learned before the live learning session. During the live session, lecture is entirely replaced by active learning methods, such as the examples of the embedded methods described earlier, combined in a particular sequence promoting deeper understanding at higher levels of learning.

A number of studies demonstrate enhanced learning (i.e., better examination performance) in a flipped classroom. Importantly, in several studies (e.g., [Freeman et al., 2011](#)) failure rates decreased up to 60% when the flipped model was used. Results of studies of student satisfaction with the flipped classroom range from equivocal to favouring the approach. Further research is needed, but teachers can be assured that the flipped classroom will likely enhance student engagement and performance.

Implementing the flipped classroom for the first time will require significant preparation time by the faculty member, but this will decrease in subsequent iterations. Planning a flipped classroom involves four steps: determining the homework, developing the activity, running the session and evaluation.

Out-of-class homework

Out-of-class homework could include readings from an assigned text, handouts, or other teaching materials created by the instructor. Increasingly podcasts or videocasts either created by the instructor or curated from online content (e.g., YouTube, Khan Academy) are used. When creating podcasts or videocasts, follow the same principles for organization, audiovisual preparation, and delivery pace and vocal tone as described earlier for lectures. Out-of-class work should be intimately linked to the objectives and should not overburden students. Students need preparation time to complete the homework before class and in-class contact time must be proportionally reduced. This is particularly important if multiple instructors are using a flipped classroom approach and students have several out-of-class assignments. The reduced contact time, however, is offset by the enhanced level of learning and retention that occurs when entire class periods are dedicated to active learning.



Tip

One way to hold students accountable to the instructor, themselves and each other for the out-of-class homework is with a readiness assurance test that contributes to their grade.

Developing the activity

A flipped classroom session will fail if students do not do preparative homework. Thus

it is important to ensure that students will be held accountable to complete the assignments. The most common and easily implemented method is the readiness assurance test (RAT) ([Michaelsen et al., 2008](#)). In the RAT, students answer several questions, often using an ARS, which records students' responses for inclusion in their course grade. Alternatively, students could be asked to submit their muddiest point (which also can promote class discussion) or to create a memory matrix ([Angelo & Cross, 1993](#)) as evidence of homework completion. Peer evaluation is another method to hold students accountable because group learning depends on everyone being prepared.

The activity itself should have a schedule that runs on time. It could include a sequence of the embedded activities mentioned earlier, adaptation of a classroom assessment technique ([Angelo & Cross, 1993](#)), or team-based learning ([Michaelsen et al., 2008](#)). Real-world examples, such as patient cases, laboratory data, and so on, that are sufficiently challenging provide a context to what the students studied out of class ([Jeffries & Huggett, 2014](#)). The common thread in these activities is that students, usually in groups, complete specific applications and explain their reasoning to their peers and instructor. Regardless of the activity, it is important to challenge students at higher levels of learning, align with the objectives, and subsequent assessments.

Running the session

Because group learning (i.e., sharing and explaining answers with other students) provides a deeper understanding of the material, it is desirable to associate students into small groups within the lecture hall. The best results occur when students are formally assigned to a small group ([Holt & Szarek, 2015](#); [White et al., 2014](#)). Groups should be encouraged to explore the logic behind their final answers and alternative responses. Emphasize that mistakes will happen as part of the learning process. The instructor must carefully monitor the time to reserve a sufficient interval for debriefing.

Upon completion, students should explain their logic to the class so that immediate but respectful feedback can be provided. Questions arising from the discussion can be answered by the instructor, or given back to the groups. In closing the session, the instructor should emphasize what was learned and acknowledge the hard work of the students.



Tip

Students should be called on at random rather than asking for volunteers, further promoting accountability among the members of the group.

Evaluation

Evaluation should include students' reactions to the session, an evaluation of their learning, and faculty peer evaluation.

Student and faculty reactions to the session are useful in adjusting future sessions. Some examples of useful statements in a student questionnaire are shown in [Box 9.4](#).

Box 9.4

Representative statements to gauge success of a flipped classroom session. Likert scale from 1 (strongly disagree) to 5 (strongly agree)

- The prework was appropriate to help accomplish the session activity.
- The session activity was relevant.
- The session activity was appropriately challenging.
- The pace of the session was good.
- Feedback provided during the debriefing session was constructive.

Student learning is often measured with a summative examination. Critique by faculty participants is also useful to adjust future sessions. The best time to evaluate session pacing and rigor is immediately after the session. Making adjustments immediately after the session assures that the activity is ready for the next iteration.

Summary

The lecture remains the most common instructional method in health science education. As more is discovered about the science of learning, the lecture is being adapted to become a more effective learning tool. Keys to promoting learning in the lecture hall include effective organization, maintaining student attention, fostering engagement, and promoting knowledge retention. An important factor is the density of lecture content, which influences the pace of delivery and the ability of students to take notes. Many studies show that active learning methods are superior in promoting learning versus passive lecturing. Lectures can be improved by introducing active learning elements or replacing lectures altogether with flipped classroom approaches.

References

- Angelo and Cross, 1993 Angelo TA, Cross KP. *Classroom assessment techniques: a handbook for college teachers* San Francisco: Jossey-Bass; 1993.
- Bligh, 2000 Bligh DA. *What's the use of lectures?* New York: Jossey-Bass; 2000.
- Educause Learning Initiative, 2012 Educause Learning Initiative. 7 Things you should know about... Flipped classroom, 2012. <https://net.educause.edu/ir/library/pdf/eli7081.pdf> (accessed 2/13/2016).
- Fagen et al., 2002 Fagen AP, Crouch CH, Mazur E. Peer instruction: results from a range of classrooms. *The Physics Teacher*. 2002;40:206–209.
- Freeman et al., 2014 Freeman S, Eddy SL, McDonough M, et al. Active learning increases student performance in science, engineering and mathematics. *Proceedings of the National Academy of Sciences*. 2014;111(23):8410–8415.
- Freeman et al., 2011 Freeman S, Haak D, Wenderoth MP. Increased course structure improves performance in an introductory biology course. *CBE Life Sciences Education*. 2011;10:175–186.
- Hake, 1998 Hake RR. Interactive-engagement versus traditional methods: a six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*. 1998;66:64–74.
- Holt and Szarek, 2015 Holt JT, Szarek JL. Organ Recitals: a large group active learning technique. In: Fornari A, Poznanski A, eds. *IAMSE Manuals: How-to guide for active learning*. Leiden, Netherlands and WV, USA: IAMSE; 2015.
- Jeffries, 2014 Jeffries WB. Teaching large groups. In: Huggett KN, Jeffries WB, eds. *An introduction to medical teaching*. Dordrecht: Springer; 2014.
- Jeffries and Huggett, 2014 Jeffries WB, Huggett KN. Flipping the classroom. In: Huggett KN, Jeffries WB, eds. *An introduction to medical teaching*. Dordrecht: Springer; 2014.
- Karpicke and Blunt, 2011 Karpicke JD, Blunt JR. Retrieval practice produces more learning than elaborate studying with concept mapping. *Science*. 2011;331:772–775.
- Krathwohl, 2002 Krathwohl DR. A revision of Bloom's Taxonomy: an overview. *Theory Into Practice*. 2002;41(4):212–218.

- [Mayer et al., 2008](#) Mayer RE, Griffith E, Jurkowitz ITN, Rothman D. Increased interestingness of extraneous details in a multimedia science presentation leads to decreased learning. *Journal of Experimental Psychology: Applied*. 2008;14(4):329–339.
- Michaelsen et al., 2008 Michaelsen LK, Parmelee D, McMahon K, Levine RE. *Team-based learning in health professions education* Sterling, VA: Stylus Publishing; 2008.
- [Onwuegbuzie et al., 2007](#) Onwuegbuzie AJ, Witcher AE, Collins KMT, Filer JD, Wiedmaier CD, Moore CW. Students' perceptions of characteristics of effective college teachers; a validity study of a teaching evaluation form using a mixed-methods analysis. *American Educational Research Journal*. 2007;44:113–160.
- [Svinicki and McKeachie, 2013](#) Svinicki MD, McKeachie WJ. *McKeachie's teaching tips*. 14th ed. Belmont, CA: Wadsworth Publishing; 2013.
- [Torre et al., 2006](#) Torre DM, Daley BJ, Sebastian JL, Elnicki DM. Overview of current learning theories for medical educators APM perspectives. *American Journal of Medicine*. 2006;119:903–907.
- [White et al., 2014](#) White C, Bradley E, Martindale J, et al. Why are medical students 'checking out' of active learning in a new curriculum?. *Medical Education*. 2014;48:315–324.

Learning in Small Groups

Dario Torre and Steven J Durning

Trends

- Increasing emphasis on small group learning and collaborative learning techniques in both the preclinical and clinical settings.
- Growing use of online learning environments and the role of small group learning, facilitation and interaction in the virtual setting.
- Increasing the use of self-assessment, peer and near-peer evaluations of small group learning.

Key concepts

- Small group learning fosters collaborative learning while enhancing learners' participation and engagement in the instructional process.
- Small group learning promotes social learning and the development of learners' agency.
- Learning in small groups is an effective strategy to further the integration of concepts from different topics and content, allowing the creation of collective knowledge over time.

Introduction

Medical educators can use a number of instructional situations for teaching learners (see [Chs. 7–14](#)). Small groups represent a teaching situation of growing importance in health professions education.

There are several theoretical frameworks that scaffold small group learning. For the purpose of the chapter, we are going to mention a few. Social interdependence theory ([Johnson & Johnson, 2009](#)) states that outcomes are defined by your own, as well as others' actions. Positive interdependence is a crucial tenet of such theory, which occurs when the individual perceives that his or her own goals can only be achieved if the others in the group achieve their own goals. Therefore the learner seeks outcomes that are ultimately beneficial to the whole group. In a social constructivist approach, learning is built upon previous learning, situated in a social context and involves a process of participation. It is the creation of relationships, mutual experiences, and coparticipation in a community of practice that leads to new meaningful learning ([Lave & Wenger, 1991](#)).

The reader is encouraged to review the benefits of small group learning to maximize potential learning. Furthermore, recent work has shown that learning situations can be complementary – for example, combining small group learning with large group teaching during lectures (see [Ch. 9](#)) can facilitate the potential benefits of instruction with each format.

What is a small group?

Small groups are instructional settings that better optimize the instructor to learner ratio and can foster collaborative learning. Collaborative learning contends that learners make meaning together, actively engaging in knowledge construction through inquiry and discussion with their peers ([Bruffee, 1999](#)). Collaborative learning within a small group can be used to clarify concepts, stimulate discussion, as well as learn from each other's inquiries and explanations. Small groups can complement large group learning by having the purpose of clarifying and delve into specific issues that might have emerged from a large group session, such as a lecture. Additionally, small groups can also help educators integrate material from multiple courses, such as a clinical reasoning small group on chest pain that could integrate anatomy, physiology, and pathology concepts into the session.

The size of the small group can vary greatly in health professions education. Prior studies suggest that groups of five to eight learners may be optimal. However, the number of students in a group does not need to conform to any set rule.



Tip

The number of students in a small group does not need to conform to any set rule.

The goal with determining small group size should focus on instructional effectiveness that will be dependent upon goals and objectives for the session and learner experience with the content being discussed (i.e., difficulty of the content). For example, if the group is too small or the material is very straightforward to learn, exchange of ideas can be limited so a balance should be struck in determining the number of students in a small group. The challenge for the health profession educator is to construct a small group size that will best facilitate exchange of ideas and concepts for the content being discussed given the learning goals and objectives for the session.

[Newble and Cannon \(2001\)](#) discuss three signature characteristics of small group learning: active participation, purposeful activity, and face-to-face contact. We believe that consistently achieving these three characteristics is essential for small group learning effectiveness.



Tip

Three signature characteristics of small group learning are active participation, purposeful activity, and face-to-face contact.

According to these authors, if the small group lacks any of these components, the activity will likely be suboptimal. For example, active participation and purposeful activity are needed for the cognitive benefits of elaboration and reflection. Elaboration and reflection accompanied by face-to-face contact are needed to optimize motivation and emotional engagement with the content. Such face-to-face interactions may also occur in an online synchronous environment (see [Ch. 21](#)). Indeed, the size of the group is less important than fulfilling these three characteristics. For example, effective team-based learning (see [Ch. 20](#)) allows for larger groups through the formation of smaller 'subgroups' within the teaching setting and can capitalize on these three signature characteristics within each subgroup. Indeed, one of the most often cited reasons for combining lecture with small groups is that it can be extremely difficult to have active participation and purposeful activity in the typical large group lecture setting.

When to use small groups

The reason(s) for choosing to incorporate small group learning into a curriculum should be primarily guided by learning goals and objectives. A secondary reason is the difficulty of the content being presented (which is dependent upon the experience of the learner with the content). As stated earlier, if the content presented in the small group session is too straight forward, the three signature characteristics discussed earlier are unlikely to be met. Further, because small groups are one of (if not the most) resource intensive teaching format, the reason(s) for using this format should be carefully considered, weighing the pros and cons of this format with alternatives.

There are many advantages to teaching in small groups, and we have introduced some of the theoretical benefits of this teaching format at the outset of this chapter. Additional benefits include:

1. Small group instructors can become more familiar with learner's knowledge, skills, and experiences with the content being discussed than in larger group teaching settings. Instruction can therefore be more customized or tailored to the learners' needs in small groups. This benefit may be particularly important with complicated material where learners may have a variety of differences in knowledge, skills, and experiences and difficulty with integrating the material to be learned.
2. In small groups, the teacher has more opportunity for individualized feedback, which has been shown to be important, especially for learning complex information.
3. Peer evaluation and self-reflection can add to teacher-directed feedback to enhance the experience for learners.
4. Learners have the opportunity to get to know their classmates and may be more comfortable asking questions during a small group session than in larger group settings; again this benefit may be particularly relevant when the content to be learned is difficult for the learner (because of their relative level of knowledge of and expertise with the content).
5. In small group learning, learners can become familiar with adult learning principles, which are something they will be encouraged to apply for the rest of their professional lives. For example, learners are encouraged to take responsibility for their own learning (self-directed learning—i.e., adequate preparation for the small group, asking questions during the session, follow-up readings after the small group session has concluded) and learners may be more motivated to use problem solving and reflection skills. In a similar vein, small group learners can develop important interpersonal and communication skills that they will use in their future practice. Small group instruction also offers the opportunity for teachers to model professionalism, respect for different opinions, and time management. Finally, small group instruction can promote engagement between the teacher, learner, and content enabling the instructor to

reinforce concepts that move beyond recalling content and asking trainees to apply this content in a more meaningful manner than in larger group settings. Therefore small group sessions should challenge the learner to apply what is learned in other settings and/or from textbook readings.

These advantages come at the cost of needing additional faculty for instructional purposes so medical schools in the United States and elsewhere typically include other teaching formats, such as lectures (face to face or online) and seminars to introduce content in larger groups and use small group learning to reinforce key learning concepts from these small group settings. Finally, recent work from the cognitive load literature suggests that using small group sessions for straightforward content can actually increase extraneous (not useful for learning) cognitive load in learners and potentially impair learning; therefore careful construction of goals and objectives for the small group session will help maximize chances of success (Sweller, 2010).



Tip

Careful construction of goals and objectives for the small group session will help maximize chances of success.

Two additional questions that are relevant when to use small group learning are: What format of small group learning? and What type of instructional methods?

What format of small group learning?

A number of small group learning formats exist. Formats of small group learning include problem-based learning (PBL) (see Ch. 19), case-based learning (CBL), and team-based learning (TBL) (see Ch. 20). This content is beyond the scope of this chapter. The reader is encouraged to review this content in other chapters of this book. A notable distinction between PBL, CBL and TBL is the role of the instructor. In PBL, the instructor is a facilitator; being a subject-matter expert on the content is not required.

In CBL, the instructor is a facilitator but also typically provides summative comments at the end of the session, sharing their subject-matter expertise. In TBL, the instructor typically provides both facilitation and subject-matter expertise, the latter often provided through both summative comments and/or pre- and postsession quizzes.

What type of instructional methods?

Several instructional methods for small group learning exist and the number of methods involving robust technology is increasing (Box 10.1). Importantly, the most successful methods have clear goals and objectives and are organized around a purposeful activity.

Box 10.1

Instructional methods for small group setting

- Case study (student review, analyze, reflect, discuss and provide a solution to a real-life scenario)
- Surrogate patient encounters (i.e., paper cases, DVD cases, standardized patients)
- Actual patients
- Journal articles (i.e., thought provoking reading material)
- Internet-based materials (i.e., wiki, blog, discussion board)
- Role plays
- Multiple-choice or open-ended questions
- Concept mapping
- Games
- A prestructured, partially completed—instructional unit of material

In health professions education, the case-based structured discussion is probably the most common approach. Learners read about and then present a patient case and work through a series of tasks which could include: asking for additional history and physical examination information, constructing a problem list, generating a differential diagnosis, comparing and contrasting diagnoses, and constructing a treatment plan. In the CBL and TBL formats, time is typically allocated for the small group instructor to clarify important teaching points and answer additional questions. In the PBL method, emphasis is placed on asking questions and the teacher may or may not provide summary or conclusion remarks.

There are also instructional models, such as the 'one-minute preceptor', which can be particularly effective in clinical teaching of small groups ([Neher et al., 1992](#)). In this model, the teacher probes for understanding and then evaluates or comes to an educational diagnosis of the learner and provides next steps for improvement. One other model or technique that can be useful in teaching small groups in the clinical setting is SNAPPS ([Volpaw et al., 2009](#)). In this technique the teacher asks learners to summarize findings, narrow and analyze the differential, while learners can probe and ask questions to the preceptor, and then select a topic for self-study. This technique, like the 1-minute preceptor, can be helpful in both the ambulatory or inpatient clinical setting yet with small groups of students (3–4).

One other instructional method that could promote small group learning is concept mapping ([Torre et al., 2017](#)). The construction of a concept map by a small group of learners fosters interactions, promotes communication, creates sharing of knowledge and ultimately allows the group to critique and learn from each other in an active and meaningful way. Such strategy can be used in classrooms or in the setting of online learning. Finally, despite being an emerging instructional strategy, the use of games in medical education has potential to be a valuable instructional tool for small group

learning. Gamification, the process of game design and problem solving in a nongame context, fosters engagement, enhances collaboration and allows real-world application of educational principles ([McCoy et al., 2016](#)).

How to effectively conduct a small group learning session

Preparing for the small group session

Preparing for the small group learning session shares many similarities to preparing for other teaching sessions, like larger group teaching sessions. First, determine the learning objectives for the session. Become familiar with student's experience (if any) with the content being discussed from other aspects of the curriculum.



Tip

Know what 'success looks like' for the small group session.

This can be done by completing the statement, 'By the end of the session, learners will be able to....' keeping in mind that small group sessions are an optimal place to ask learners to demonstrate higher-order skills, such as problem-solving, reflection, and clinical reasoning. The reader is also encouraged to review materials on constructing goals and objectives. Second, know your audience (the learners) and the curriculum. For example, what has been the learners' prior experience with the content to be discussed in the small group session in the curriculum? What topic or concept(s) might be particularly challenging for the learners? Third, become familiar with the structure of the small group learning session to include time for the session, instructional materials, and number of sessions. Think about the activities and methods needed to achieve success. For example, is a review of a pertinent case from the last session or beginning the session with one or more multiple choice or open-ended questions needed? Fourth, it can also be very helpful to develop an instructional 'agenda' for the small group learning session. This optimally will be provided by the course or clerkship director (i.e., key teaching points and students' strengths or difficulties with the content from other aspects of the course). We believe that providing instructors with key teaching points, particularly for CBL and TBL, is important to maximize effectiveness of the session. These teaching points can also be used for examination purposes and should reflect what is essential—key elements for discussion in the session. We do not, however, believe that these key teaching points should require most or all of the time scheduled for the small group session. Indeed, providing teachers with a comprehensive or highly time-consuming list for discussion can lead to mini-lectures and/or stifling discussion.

Leading the small group session

Experienced small group instructors recognize that their teaching style and the

dynamics of the group are important elements. The time that the instructor spends preparing in advance should improve the organization and flow of the session. The attitude and behaviour (both verbal and nonverbal) of the instructor is one of, if not the most critical element for small group learning success (Jaques, 2003). In the actual session, the focus should be on the learner.

We believe that an effective approach is to introduce your role at the first session, and let learners know how and when they can reach you outside of the session if they have additional questions or concerns. Each small group can be different based on the dynamics of the group members and the content being covered so careful attention to the group dynamics, as well as your own teaching strengths and weaknesses, is important for success. Emphasizing the learner-centred approach is necessary for effective small group sessions. In this approach, the teacher seeks understanding and provides frequent feedback to help the individual learner and the group to improve.

Conditions for an effective session

The beginning of the small group session is very important. In effective sessions, the instructor will typically set the learning climate, state the goals and objectives, and provide some basic 'ground rules' which outline what is acceptable and unacceptable (i.e., arriving late or holding 'sidebar' conversations) behaviour. Ground rules are important because successful small groups rarely occur simply because there is the meeting of a talented teacher with highly motivated learners. Discuss expectations for preparation, participation, and evaluation. This is important as studies suggest that when learners are aware of evaluation criteria, they are likely to be more willing to participate. Try to generate a learning environment that is cooperative rather than competitive as the latter can lead to lack of participation by all but the most dominant members. A cooperative as opposed to a competitive learning environment can be particularly challenging to balance—evaluating learners while fostering a cooperative learning environment.



"The secret of education is respecting the pupil."

Ralph Waldo Emerson

Some ways to improve this balance include making small group session grades formative, using an evaluation system that sets learners up for success, and/or holding multiple small group sessions with learners (i.e., they receive a grade at the very end vs. after each session). A combination of formative and summative evaluations may be particularly helpful for small groups to achieve their goals and for instructors to assess the growth and development of small group members over time.

In the adult learning model, the teacher as lecturer is replaced with the teacher as facilitator. We believe that in a highly effective small group session it may at times be difficult to distinguish the teacher from the learners. For instructors brought up in the lecture format of teaching and learning, small group learning can be a difficult skill set

to acquire. Some teachers who are highly effective in large group settings (i.e., lectures) are not skilled at small group learning and will resort to mini-lectures if not provided with training in small group learning. Faculty development needs should be identified and addressed ([Box 10.2](#)).

Box 10.2

Tips for a successful small group session

Getting started

- Clarify objectives and purposes of the session
- Be available to clarify instructions and review ground rules for group interaction
- Keep track of time or appoint a timekeeper
- Expect silence, lack of knowledge, and uncertainty



Tip

Do not assume that a teacher's success in large group teaching will equate to effective small group learning.

For example, highly effective lecturers may be uncomfortable with silence, unexpected discussion directions or how to convey key teaching points without using the 'podium with PowerPoint slides'. Some general guidelines or tips for the small group teacher include:

At the session

- Seek information (request facts from learners) and opinions.
- Use learning material and tasks that emphasize sharing of information, interaction, problem solving and group's communication.
- Encourage participation of all group members (and prevent monopolization of the session by one or two students) facilitating learner interaction (enhance understanding, promoting teamwork).
- Probe thinking process—try to think out loud with providing explanations to help students with complex tasks like clinical reasoning; ask students to explain their underlying thought process as well as the concepts they are applying, assumptions they are making and approach to the problem.
- Do not provide too much information (do not lecture and encourage students to follow up on questions raised during the session to enhance their learning).
- Point out misconceptions or inaccurate information.

- Foster the practice higher order skills (interpretation, reflection, synthesis, transfer).
- Promote the practice of think out-loud (students can benefit from hearing thoughts and feelings of others) and stress the value of diversity of opinions and respect for peers.
- Stress how a question can be addressed from many different perspectives.
- Provide regular and timely feedback.
- Close the session with a wrap up of key points and set the stage for the next session.

We believe that small group instructors need to understand group dynamics to be successful in this teaching format, particularly when the session is going in a less than optimal fashion. [Scholtes et al. \(2000\)](#) describe stages that groups often undergo that can help the small group teacher. These four stages are outlined later and, notably, characteristics of an effective small group teacher at each stage are listed in parentheses.

Forming: group members feel excitement and anticipation; some experience anxiety (develop relationships and establish rules)

Storming: resistance to tasks or expressed concerns about too much work; arguments (aid resolution of issues)

Norming: demonstrate acceptance of others in group; cohesion; fosters discussion and feedback (promote collaboration)

Performing: group's ability to work through problems; understanding of strengths and weaknesses of group members (monitor progress and provide feedback)

Evaluating the small group session

Evaluation of the small group session involves two components, evaluation of small group members and evaluation of the teacher. For the former, it is important to emphasize that the activity is a meaningful part of the curriculum and for the latter, it is important to help the instructor become even more effective in this role. Both foster communication skills (team member versus leader) that ultimately can affect patient care. From a programme evaluation perspective, small group evaluation, in large part, reflects the adequacy of the learning environment (infrastructure, resources, and personnel).

Evaluation of small group learning and participation

It is important to make criteria for participation explicit to the learner. This may actually foster their participation. When possible, invite small group learners to participate in determining criteria so they feel responsible for their learning and success of the group. Examples of criteria are available elsewhere. In establishing criteria for small group evaluation, it is important to allow flexibility for small group teacher style, provide clear guidelines that both teachers and learners can understand, and not set up a summative environment as this may detract from learner's participation. Students' self-assessment

coupled with evaluation of their peers, teacher, and near-peer faculty can all be useful tool to gather information about small group learning:

1. Student self-assessment, as well as student evaluation of their peers in the group, may be helpful to avoid social loafing, thus enhance individual accountability and responsibility. Social loafing is the reduction of individual effort when working with others, ultimately hindering achievement of the group's goals. Evaluation of small group learning can be accomplished by assessing the group's ability to solve a clinical or educational problem, complete a project, or create an instructional course. For example, the teacher may provide a group with a clinical vignette of a patient with difficulty breathing and expect the group to generate a differential diagnosis of the problem coupled with an explanation of why each diagnosis is likely or unlikely. The ability of the group to search, analyze, process and synthesize information to arrive at a correct diagnosis may constitute a measurable learning outcome.
2. Peer faculty evaluation is a particularly helpful and formative yet often an underutilized evaluation strategy. Data can be collected through direct observation of teaching with a structured evaluation form or videotape review of a prior teaching session. Importantly, direct observation by peers should seek to obtain adequate sampling (view the teacher on multiple occasions) to ensure reliability of the data. Yet such formative evaluation strategy needs to be nonjudgmental, immediate and delivered in a nonthreatening way.
3. Teacher's evaluation: formal questionnaires and surveys may be given to students to evaluate the effectiveness of each teacher in the small group setting, with a focus on his or her ability to act as a facilitator, role model, and developer of instruction for the group.
4. Evaluation of group performance: the instructor provides an evaluation of the group performance based on the achievement of a competency, development of a product (may be the solution of a clinical case or the design of a curriculum) or completion of a task previously defined.

Also evaluation data needs to be collected in an accurate and timely manner and timing is an important issue as one does not want to collect such data too far after the actual teaching event.

Ultimately providing small group teachers with acknowledgments of excellence, such as teaching awards, can help motivate teachers while promoting a climate of continual improvement. The reader is encouraged to view resources regarding this topic, which is beyond the scope of this chapter.

Encouraging faculty participation should be the goal of any academic institution. Faculty (instructors) can benefit in several ways. Most important is enhancing their own communication skills that ultimately enhance patient care. Encouraging faculty participation also serves as a means to expose learners to the various specialties in medicine. Exposure to different clinical specialties (e.g., internal medicine and surgery) of instructors may affect learner's career choices. Faculty participation also provides the learner with a potential mentor based on a mutual rapport that can continue throughout

the curriculum. Institutional support through monetary bonuses, faculty appointments, continuing medical education credit and academic awards can also enhance involvement. In addition to the aforementioned, institutions may benefit from small group learning as a recruitment tool to recruit faculty who seek opportunities for student interaction and to document active learning as an accreditation criterion.

Summary

Small group learning can be a highly effective educational method. Benefits of this method can be maximized by carefully considering the goals and objectives of the session, by providing materials in which the learners can meaningfully engage in the content, having awareness of small group learning benefits, and incorporating a system of learner, as well as teacher evaluation and feedback that is clear and explicit. The attitude of the teacher and rapport developed with the learner is also critical for success. Knowledge of some of the theoretical frameworks of small group learning coupled with the practice of few effective techniques can greatly enhance teaching effectiveness in the small group setting.

References

- Bruffee, 1999 Bruffee KA. *Collaborative learning: higher education, interdependence, and the authority of knowledge* Baltimore: Johns Hopkins University Press; 1999.
- Jaques, 2003 Jaques D. Teaching small groups. *British Medical Journal*. 2003;326:492–494.
- Johnson and Johnson, 2009 Johnson DW, Johnson RT. An educational psychology success story: social interdependence theory and cooperative learning. *Educational Researcher*. 2009;38(5):365–379.
- Lave and Wenger, 1991 Lave J, Wenger E. *Situated learning: legitimate peripheral participation* Cambridge University Press 1991.
- McCoy et al., 2016 McCoy L, Lewis JH, Dalton D. Gamification and multimedia for medical education: a landscape review. *The Journal of the American Osteopathic Association*. 2016;116(1):22–34.
- Neher et al., 1992 Neher JO, Gordon KC, Meyer B, Stevens N. A five-step “microskills” model of clinical teaching. *Journal of American Board of Family Practice*. 1992;5:419–424.
- Newble and Cannon, 2001 Newble DI, Cannon RA, eds. *Handbook for medical teachers*. 4th ed. The Netherlands: Kluwer Academic Publishers; 2001.
- Scholtes et al., 2000 Scholtes PR, Joiner BL, Joiner BJ. *The TEAM handbook* Madison, WI: Oriel, Inc; 2000.
- Sweller, 2010 Sweller J. Element interactivity and intrinsic, extraneous, and germane cognitive load. *Educational Psychology Review*. 2010;22(2):123–138.
- Torre et al., 2017 Torre D, Daley BJ, Picho K, Durning SJ. Group concept mapping: an approach to explore group knowledge organization and collaborative learning in senior medical students. *Medical Teacher*. 2017;39(10):1051–1056.
- Volpaw et al., 2009 Volpaw TM, Papp KK, Bordage G. Using SNAPPS to facilitate the expression of clinical reasoning and uncertainties: a randomized comparison group trial. *Academic Medicine*. 2009;84(4):517–524.

Clinical Teaching

Subha Ramani and John A Dent

Trends

- Teaching in clinical settings provides a unique opportunity for tutors to role model a holistic approach to patient care.
- A thoughtful approach to educational strategies can provide a road map for maximizing the usefulness of this venue for student learning.
- Ambulatory care teaching has emerged as an equal partner to inpatient based teaching and it is important for medical schools and teaching hospitals to use a variety of real and simulated clinical settings.
- New approaches to clinical assessment and staff development should be adopted to maximize the learning opportunities provided by the variety of clinical teaching settings.

Key concepts

- Clinical teaching: refers to teaching in a variety of clinical settings, such as inpatient, outpatient, simulated clinical venues and conferences where patient care is the focus.
- Bedside teaching: traditionally refers to ward-based bedside rounds, however, it is better described as teaching in the presence of patients in any real or simulated clinical setting, as well as case-based conferences where patients are present and participate in the discussion.
- Role modelling: a powerful form of clinical teaching that becomes more important in a time where clinical teachers and learners have increasing work commitments, time is limited for direct patient interactions and technology is an ever-present ally, as well as challenge.
- Clinical skills: although the focus is often on history taking and clinical examination, skills such as: reflective practice, clinical reasoning, humanism, empathy, patient, peer and interprofessional communication skills, and teamwork are essential to provide excellent patient care.

Introduction

Clinical teaching is the essence of medical school experience. Students are motivated by the stimulus of patient contact; they learn to apply the theoretical concepts learned during preclinical years and discover the humanism of medicine; the art that goes with the science.



"To study the phenomena of disease without books is to sail an uncharted sea, whilst to study books without patients is not to go to sea at all."

Sir William Osler

But the traditional, consultant-led ward round, which epitomizes the view of clinical teaching, has not been without its shortcomings. Students may feel academically unprepared or inexperienced in the learning style required in an unfamiliar environment. Perceived inappropriate comments, unpredictable starts, cancellations and a chaotic work environment may discourage students and decrease the value of the experience. Advances in medical treatment and changing patterns of healthcare delivery have led towards increased ambulatory and community care such that today's teaching hospitals may paradoxically have fewer patients appropriate for clinical teaching than previously. For the purposes of this chapter, we define clinical teaching as one that occurs whenever patient care is being discussed, in their presence or in a conference room: hospital wards, ambulatory teaching, clinical conferences and simulation centres where students practise patient-care skills.



"Clinical teaching for the 21st century is not about teaching: it is about supporting students' learning from real patients within clinical practice."

Dornan et al. (2019)

Despite various challenges, clinical teaching that actively engages patients provides optimal opportunities for the demonstration and observation of physical examination, communication skills, interpersonal skills and for role modelling a holistic approach to patient care. Not surprisingly, this form of teaching is rated as one of the most valuable methods of clinical teaching. Yet, clinical teaching in the presence of patients has been declining in medical schools since the early 1960s ([Peters & Ten Cate, 2014](#)). Although time constraints are often reported as a major barrier, it also appears that clinical acumen is now perceived as being of secondary importance to clinical imaging and extensive investigations ([Ramani & Orlander, 2013](#)).

The 'learning triad'

Traditional clinical teaching brings together the 'learning triad' of patient, student and clinician/tutor in a particular clinical environment. When all works well, this provides an ideal situation for effective student learning. Direct contact with patients is essential for the development of clinical reasoning, communication skills, professional attitudes and empathy, but preparation is required from each party involved.



"Skills such as professionalism, humanism and patient communication are best taught at the bedside, and proficiency in clinical skills may eventually decrease the overreliance on investigations."

Ramani and Orlander (2013)

Patients

Before the session, patients should be informed and have the opportunity to decline to participate without feeling coerced. Some institutions may require formal documentation of informed consent. Patients should be adequately briefed about the goals of the session and who the participants will be.

During the session, patients should be actively engaged in the discussion and encouraged not only to participate in providing clinical data but also as teachers and role models for clinical learners (Towle & Godolphin, 2015). Depending on the model of clinical teaching used, a variety of patients will be required for varying lengths of time but remember that consideration should be given to their needs, their enthusiasm for engaging in the teaching encounter, and their knowledge and experience. Usually, patients enjoy the experience and feel they have contributed to student learning.

Afterwards, patients should be asked to give some feedback to students. As the most important member of the triad, their comments will be valuable to young learners. Do not forget to thank patients for taking part and to clarify any confusions that may have been created. The role of patients as educators is discussed in more detail in [Chapter 45](#).

Students

It is best if students have had some prior experience with simulated patients in supervised learning venues where they have practised physical examination and communication skills. Real clinical venues, with patients and other interdisciplinary staff present, can seem quite intimidating at first. Between two and five students is probably the optimal number for bedside teaching. Students should comply with the medical school's directives on appropriate appearance and behaviour and, if unaccompanied by a clinical tutor, should introduce themselves to staff and patients clearly stating the purpose of their visit.

During clinical teaching sessions, students may feel intimidated by the unfamiliar environment, the proximity of other healthcare staff and putting personal questions to patients. They may be unsure of their knowledge base or clinical abilities and fearful of consultant and near-peer criticism. As a result, some may avoid participation, whereas others monopolize conversations with patients and tutors. Tutors need to look out for these behaviours, provide a nonthreatening learning environment, allay anxieties and ensure that all students have the opportunity to participate. Experience-based learning (ExBL), a concept described recently, emphasizes the importance of a safe learning environment and teachers supporting student participation in practice as essential elements to effective real patient learning ([Dorman et al., 2019](#)). Maximizing student engagement with patients should be a primary goal for clinical tutors and supervisors, or the full impact of clinical teaching cannot be achieved.

Afterwards, remember to debrief the students, provide time for questions, and clarify any misunderstandings.

Tutors

Tutors for teaching in all clinical settings may be consultant staff, junior hospital doctors, nurses or student peers. Preparation is critical to a successful clinical teaching session and may include enhancing clinical skills, establishing educational goals, orienting patients ahead of time and being prepared to deal with unpredictable incidents that may arise ([Cox, 1993](#)).



Tip

The seven roles of a clinician/teacher useful for achieving good clinical teaching:

- medical expert
- communicator
- collaborator
- manager
- advocate
- scholar
- professional

Appropriate knowledge

Experienced clinical teachers are soon able to assess both the patient's diagnosis and requirements, as well as the students' level of understanding. This ability to link clinical reasoning with instructional reasoning enables them to quickly adapt the clinical teaching session to the needs of the students.

Six domains of knowledge have been described, which an effective clinical tutor will

apply (Irby, 1992):

- Knowledge of medicine: integrating the patient's clinical problem to background knowledge of basic sciences, clinical sciences and clinical experience
- Knowledge of patients: a familiarity with disease and illness from experience with previous patients
- Knowledge of the context: an awareness of patients in their social context and their stage of treatment
- Knowledge of learners: an understanding of the students' present stage in the course and of the curriculum requirements for that stage
- Knowledge of the general principles of teaching, including:
 - getting students involved in the learning process by indicating its relevance
 - asking questions, perhaps by using the patient as an example of a problem-solving approach to the condition
 - keeping students' attention by indicating the relevance of the topic to another learning situation
 - relating the case being presented to broader aspects of the curriculum
 - meeting individual needs by responding to specific questions and providing personal tuition
 - being realistic and selective so that relevant cases are chosen
 - providing feedback by critiquing case reports, presentations or examination technique
- Knowledge of case-based teaching scripts: the ability to demonstrate the patient as representative of a certain clinical problem. The specifics of the case are used but added to from other knowledge and experiences to make further generalized comments about the condition.

Appropriate skills

If demonstrating clinical tasks to students in the ward or ambulatory setting, tutors should be competent in performing them in whatever uniform approach has been taught in the clinical skills centre. They should avoid demonstrating inappropriate 'shortcuts' to junior students. Validated shortcuts can be taught to more senior students with detailed explanation of their appropriate use.

Appropriate attitudes

Whether they appreciate its significance or not, tutors are powerful role models for students, so it is most important that they demonstrate appropriate knowledge, skills and attitudes (Cruess et al., 2008).



"Clinicians following ExBL principles empower students and patients to be active participants in practice-based learning, which is a far cry from 'teaching by humiliation'."

Dornan et al. (2019)

Any tutor responsible for scheduled clinical teaching, in the wards, clinics, clinical conferences or simulation centres, must arrive punctually, introduce themselves to the students and demonstrate an enthusiastic approach to the session. A negative impression at this stage will have an immediate negative effect on the students' attitude and on the value of the session. Tutors should show a professional approach to the patients, interact respectfully with them and the students and actively engage appropriate patients as fellow educators.

Afterwards, try to reflect on the teaching event and identify any parts you could have done better.

Educational strategies for clinical teaching

Though models for effective clinical teaching have been described specifically for ward-based and ambulatory teaching, many of these educational principles and strategies can be adapted for different clinical settings. Some established models are described in this section.

Strategies for inpatients

Cox's cycle

A linked two-cycle model has been described ([Cox, 1993](#)) to maximize the students' learning from each patient contact.

The 'experience cycle' involves student preparation and briefing to ensure that they are aware of what they are going to see and the opportunities available for learning. Before beginning, students should be briefed so that they understand the purpose of the session and the goals to be achieved. Any warnings about the patient conditions to be seen should be given and checks made on students' level of initial understanding. This is followed by the clinical experience of interacting with their patient, which may include history taking and physical examination, discussing the illness and thinking about management.

After leaving the patient, the experience cycle concludes with debriefing when the information gathered is reviewed and interpreted and any misperceptions or misunderstandings clarified. The experience cycle maximizes the value of the time spent with the patient.

The 'explanation cycle' begins with reflection when students are encouraged to consider their recent clinical interaction in the light of previous experiences. Explication continues with the understanding of the clinical experiences at different levels according to the students' stage of learning and its integration into their previous learning experiences. Finally, a working knowledge is synthesized, which prepares the students for seeing a subsequent patient ([Fig. 11.1](#)).

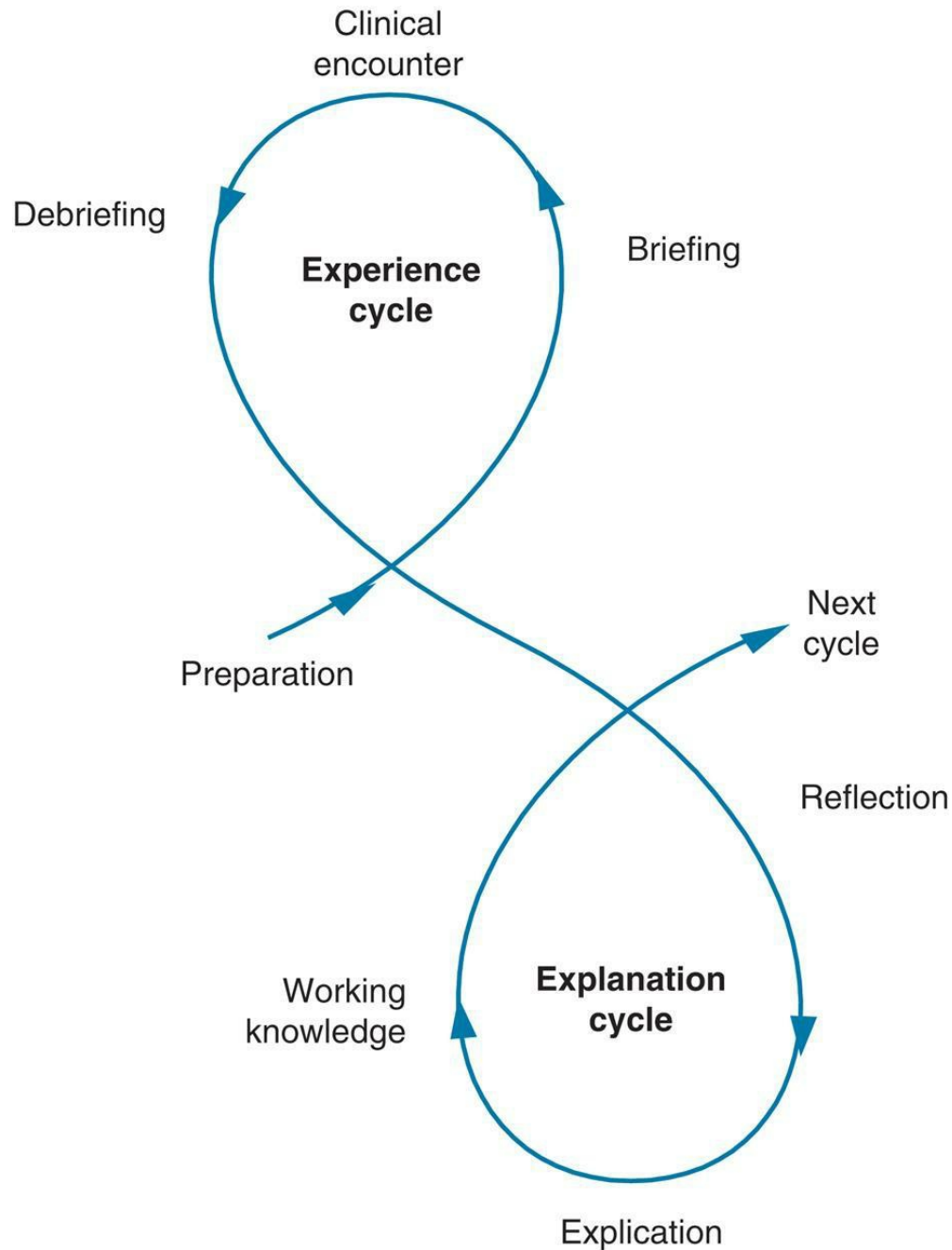


FIG. 11.1 Bedside teaching model. (Modified from Cox, 1993.)



Tip

Twelve tips to improve bedside teaching (Ramani, 2003):

1. Preparation: revise your own skills, the learners' needs and the curriculum.

2. Planning: construct a road map of the activities and objectives of the session.
3. Orientation: orientate the learners to your plans for the session.
4. Introduction: introduce everyone present including the patient!
5. Interaction: role model a doctor–patient interaction.
6. Observation: watch how the students are proceeding.
7. Instruction: provide instruction.
8. Summary: tell the students what they have been taught.
9. Debriefing: provide time for questions and clarifications.
10. Feedback: allow time to give positive and constructive feedback to students.
11. Reflection: evaluate from your perspective what went well and what was less successful.
12. Preparation: prepare for your next bedside teaching session.

MiPLAN

Stickrath and colleagues described a three-part model for efficient bedside teaching ([Stickrath et al., 2013](#)):

- M: meeting between teacher and learners to get acquainted, set goals, clarify expectations
- I: five teaching behaviours at the bedside:
 - introductions: introducing the team to patients and orienting them to the agenda
 - in the moment: focused listening
 - inspection: observation of patient and engagement of entire team
 - interruptions: minimizing them
 - independent thought: encouraging clinical reasoning
- PLAN: algorithm for teaching after bedside presentations
 - patient care: clarification of clinical findings, role modelling
 - learners' questions: responding to questions
 - attending's agenda: teaching points, referring to relevant literature
 - next steps: debriefing, feedback, questions for further learning

Strategies for outpatients

A structured approach is the key to maximizing the learning opportunities available to students in any ambulatory care venue ([Dent, 2005](#); [Irby et al., 1991](#)). Two key models, SNAPPS and microskills for students, are described later.

Learner-centred approach

Students present cases to their tutor in a structured way under the heading SNAPPS, which encourages a question and answer approach ([Wolpaw et al., 2003](#)).

- Summarize the history and physical findings
- Narrow down the differential diagnosis
- Analyze the diagnosis by comparing possibilities
- Probe the preceptor with questions
- Plan patient management
- Select a case issue for self-directed learning

Microskills for students

Lipsky and colleagues describe how students can take the initiative both before and after the outpatient event to facilitate their own learning ([Lipsky et al., 1999](#)).



Tip

Twelve tips for students to improve their learning in the ambulatory setting:

1. Orientate to the objectives of the session
2. Share their stage of clinical experience with the tutor
3. Orientate to the clinical location
4. Read around the clinical conditions to be seen
5. Review case notes or summaries provided
6. Be prepared to propose a diagnosis and management plan
7. Explain their reasons for these decisions
8. Seek self-assessment opportunities
9. Seek feedback time from the tutor
10. Generalize the learning experience
11. Reflect on their learning
12. Identify future learning issues

From Lipsky et al. (1999)

Educational strategies applicable to all clinical settings

Outcome-based education

Though many of the educational objectives of the clinical curriculum are experienced to different extents by students in individual ward-based or ambulatory clinical rotations, combined they span the complete spectrum of desired outcomes (see [Ch. 16](#) Outcome-based education). All these aspects can be seen in the context of the patient as an individual rather than in the purely theoretical context curriculum design.

Time-efficient strategies for learning and performance

Irby and Wilkerson describe strategies for teaching when time is limited ([Irby & Wilkerson, 2008](#)) ([Box 11.1](#)).

Box 11.1

Teaching strategies for clinical teachers

Planning

- Direct/orientate learners
- Create a positive learning environment
- Preselect patients
- Prime/brief learners

Teaching

- Teach from clinical cases
- Use questions to diagnose learners
- Ask advanced learners to participate in teaching
- Use 'illness scripts' and 'teaching scripts'

Evaluating and reflecting

- Evaluate learners
- Provide feedback
- Promote self-assessment and self-directed learning

Structured logbooks

Structured logbooks can help students organize the content of their ambulatory care and inpatient sessions and to identify the educational opportunities available. They can be used to focus student learning by asking them to consider their experiences as related to the learning outcomes and then reflect on what further learning needs they can now identify and meet. The variety of patients with clinical problems suitable for students will inevitably vary in all real clinical settings. Because clinical teaching, particularly in inpatient settings, tends to be opportunistic, logbooks may be used to assess the range of clinical conditions seen and identify omissions in student experience, but their primary role should be to help students reflect widely on their clinical experiences and provide a focus for periodic tutor-review, mentoring and feedback.

Task-based learning

A list of tasks to be performed or procedures to be observed and carried out is usually a course requirement in ward-based and ambulatory rotations. Students should be given this list and their proficiency in any of these tasks can be scored in their clinical record book. These tasks may include:

- Participate in consultation with the attending staff.
- Interview and examine patients.
- Review a number of new radiographs with the radiologist.
- Observe specific inpatient and outpatient procedures performed by junior doctors or consultants.

Additional tasks for future learning can then be built around each.

Problem-based learning

The patient's presenting complaint can be used as the focus of a problem-based learning exercise in which basic sciences and clinical sciences can be integrated. If feasible, patients can be invited to attend these conferences and interact directly with students. The presence of patients always adds great educational value to all sessions.

Study guides

A prescribed list of conditions to be seen in the ward or ambulatory settings may be laid out in the study guide with the learning points to be achieved documented for each.

Case studies

'Focus scripts' described by Peltier and colleagues ([Peltier et al., 2007](#)) are used to facilitate the learning of history taking and physical examination skills. Similarly, using the patient journey as a model, students may be directed to follow a patient through a series of ambulatory care experiences from the outpatient department, through clinical investigations and preoperative assessment to the day-surgery unit and follow-up clinic

([Hanna & Dent, 2006](#)). This strategy can also be applied effectively to the ward-based environment.

Hospital ward opportunities—models for managing learning in the ward

Apprenticeship/shadowing a junior doctor model

Shadowing a junior doctor for several weeks on the unit where they will subsequently be working has become a required part of the final-year programme for medical students in the United Kingdom. Opportunities are plentiful for junior doctors to model task-based learning and professionalism.

Grand rounds

Popular in some countries, this consultant-led ward round or conference room presentation usually includes senior clinicians, trainees, junior doctors and other healthcare professionals.

Business ward round

This is a challenging activity for both clinicians and students. Little time is available for formal teaching, observing student performance or providing feedback. It may be necessary for the clinician to explain decisions being made in a variety of levels of complexity depending on the experience or seniority of others on the ward round. There may be little time for direct student teaching, but time-efficient teaching strategies described earlier would be effective in this setting.

Teaching ward round

In this specially scheduled teaching event, students see a small number of selected patients who provide opportunities to elicit physical signs and hear aspects of the case history. At the bedside the tutor can lead the session in different ways:

- Demonstrator model. The clinical tutor demonstrates aspects of the case history and physical examination to the students.
- Tutor model. The clinical tutor stands to the side and critiques each student in turn as they interview the patient and carry out physical examination.
- Observer model. The clinical tutor observes a single student or pair of students in a longer portion of history taking or examination, providing feedback to them all at the end as they discuss their findings and clinical interpretation.
- Report-back model. Students interview and examine patients without supervision and subsequently report back to the tutor elsewhere to present the case and receive feedback on content and delivery.

Clinical conference

Diagnostic and management problems are discussed by the group of healthcare professionals. Students have the opportunity to observe the multifaceted management of difficult cases and the spectrum of professional input that may be required.

Training ward

A purpose-made training ward has been found to provide students with a useful opportunity to develop skills and knowledge in relation to patient management and interprofessional teamwork ([Reeves et al., 2002](#)).

Ambulatory care opportunities

When should ambulatory care teaching be provided?

Because hospital wards may no longer have patients with common clinical problems who are sufficiently well to see students, ambulatory care can offer a wide range of suitable clinical opportunities for undergraduates at all stages of learning. Less experienced students who are still developing their communication and examination skills can practise these in the dedicated ambulatory care teaching centre, which provides a stepping-stone from practising with simulated patients and manikins in the clinical skills centre to meeting real patients in the busy environment of everyday outpatient department.

Traditional venues

Having one student joining a clinician in their clinic can be a relatively straightforward experience, but a variety of models can be used depending on their experience.

Sitting-in model

One-to-one teaching is much appreciated by students who can observe the patient consultation by sitting with the clinician as they learn to interact confidently with the clinician and patients, but they may not have the chance to see patients independently. Less confident students may feel vulnerable in this setting and need encouragement to participate but more senior students may be able to function more fully.

Apprenticeship/parallel consultation model

A small number of senior students may be able to interview the patient either alone or under supervision. This involves active student–patient interaction, which reinforces learning. Some students may feel intimidated when performing under observation, but if a separate room is available, they can interview and examine a patient without constraints before later presenting the case to the tutor.

Report-back model

Students see patients without supervision and at an appointed time present them to the clinician. Students have time and space to interview and examine their patient at their own pace. Meanwhile, the clinician will have been able to see other patients attending the clinic independently.



Tip

Decide which model you are going to use in your clinic depending on how many

rooms are available for you to use and how many members of staff are available to help with the clinic. Do not be afraid to change models during the clinic to vary the session for the students and yourself.

Other models may be useful if a larger group is attending your clinic.

Grandstand model

Frequently, students are crowded into the consulting room attempting to observe and hear the consultation. Interaction with both patient and clinician is limited, and patients may feel threatened by the large audience. The clinician's interaction with the patient may also be inhibited. The use of a study guide or logbook to direct independent learning may be helpful for students here.

Breakout model

Students sit in with the clinician and observe a whole consultation with a patient. They then take it in turns, individually or in pairs, to take the patients to another room to go over parts of the interview or examination again at their own pace.

Supervising model

If several rooms are available, the students may be divided into smaller groups to see selected patients independently in a separate room. After a suitable time, the clinician can go to each room in turn to hear the students' report on their interview. The students have time and space to interview and examine their patient at their own pace and benefit from individual feedback on their performance.

Additional venues

Teaching opportunities with outpatients may also be found in a variety of other areas with other healthcare professionals, for instance, clinical investigations, radiology, day surgery, haemodialysis, as well as in clinic waiting areas.

Innovative venues

Ambulatory care teaching centre

This specific teaching area provides a structured programme for teaching with ambulatory patients. An ambulatory care teaching centre (ACTC) ([Dent et al., 2001](#)) can give students the opportunity to meet selected patients with problems relevant to their stage of learning and timetabled clinical tutors who are not being required to provide patient care at the same time. Unlike a routine outpatient clinic, this protected environment helps students to feel comfortable to practise focused interview or examination skills free from embarrassment or time constraints.

Clinicians with an interest in teaching can be asked to take special teaching sessions in the ACTC, often with the help of patients invited to attend from a 'bank' of patient volunteers. Students can rotate between different tutors who can supervise different

activities, such as history taking, physical examination or procedural skills.

Supplementary resources, such as summarized case notes for the patients invited, laboratory reports, radiographs or revision material from basic sciences all help students to integrate their learning. A supply of video recordings to illustrate history taking and clinical examination technique provide a useful backup resource.

Integrated ambulatory care programme

At the University of Otago in Dunedin, New Zealand, an ambulatory care teaching resource has been created to provide fourth-year students with the opportunity to see a variety of invited patients illustrating clinical conditions in particular organ systems. Students appreciated the dedicated and structured teaching time in a learner-friendly environment ([Latta et al., 2013](#)).



Tip

Developing a teaching programme in ambulatory care requires:

- the identification of available venues
- development of innovative teaching venues
- the cooperation of enthusiastic staff
- a structured approach to teaching and learning
- a staff development programme
- establishing a patient 'bank'
- team-based approach to teaching (consultants, nurses, allied healthcare professionals, etc.)

Assessment of clinical learning

Assessment of clinical skills may be carried out through review of written material ([Denton et al., 2006](#)).

- Tutor review of a logbook or e-logbook can be done by the tutor in isolation but is more valuable for formative assessment if carried out together with the student.
- A checklist can be used to monitor tasks accomplished during the session, but descriptors should be used to guide the assessor to evaluate the level of student competency achieved more precisely.
- Reflective diaries are valuable for student revision and reflection and also to identify any omissions in their learning.

Alternatively, students' clinical skills can be formally assessed (see [Ch. 35](#)), but this may be more difficult given the time constraints of the inpatient and ambulatory care settings.

- Mini CEX ([Norcini & Burch, 2007](#)). Multiple short, focused assessments of clinical skills, followed by feedback, are carried out by a variety of assessors during the attachment.
- Direct observation of procedural skills (DOPS) ([Norcini & Burch, 2007](#)). The student's or trainee's ability to carry out a wide range of procedures can be closely assessed using a structured score sheet followed by feedback.
- Microskills for students ([Lipsky et al, 1999](#)). Students take the initiative to seek self-assessment opportunities and feedback throughout the clinical session.

Staff development

All those involved in clinical teaching bring a different perspective to patient care, which is valuable for student learning. Sometimes they will have received no specific preparation for the teaching session and may not know how any particular session fits into the totality of the students' clinical experience at a particular stage of the course. Tutors' individual approaches to clinical examination will also differ as examination technique may not be standardized within the medical school. Although it may be of benefit for more confident students to observe a variety of different approaches to clinical skills, weaker ones will find this lack of consistency confusing. Ideally, tutors should be briefed so that they are familiar with the approach to physical examination taught in the clinical skills centre and with the levels of expertise required of students at the various stages of the medical course.

Formal staff development sessions or simple instructional booklets are often available to help colleagues unfamiliar with the medical school curriculum, student learning needs, or with clinical teaching in the context of providing patient care.

The importance of training clinicians for their teaching role has been repeatedly emphasized. [Ramani and Leinster \(2008\)](#) have particularly applied this model for teachers in the clinical environment ([Table 11.1](#)).

Table 11.1 Training clinicians for their teaching role

| Tasks of a clinical teacher (doing the right thing) | Approach to teaching (doing the thing right) | Teacher as a professional (the right person doing it) |
|--|--|---|
| Time efficient teaching Inpatient teaching Outpatient teaching Teaching at the bedside Work-based assessment of learners in the clinical setting Providing feedback | Showing enthusiasm for teaching and towards learners Understanding learning principles relevant to clinical teaching Using appropriate teaching strategies for different levels of learners Knowing and applying principles of effective feedback Modelling good, professional behaviour including evidence-based patient care Grasping the unexpected teaching moment | Soliciting feedback on teaching Self-reflection on teaching strengths and weaknesses Seeking professional development in teaching Mentoring and seeking mentoring Engaging in educational scholarship |

Summary

Clinical teaching is most effective when a variety of venues are used synergistically to teach, demonstrate, practise and assess core clinical skills. The ward setting, traditionally the bastion of clinical learning experiences, is no longer the dominant venue for clinical teaching as inpatients are now fewer in number and more often acutely ill. Transferring the emphasis of teaching to the ambulatory care setting opens a number of previously underused venues for student–patient interaction. The educational objectives to be achieved are different in ward-based and ambulatory teaching but are synergistic and complement each other. Increasing availability of simulation centres provides a safe environment in which to practise core clinical skills along with the freedom to make mistakes and learn from them.

A teaching programme optimally combining ward-based and ambulatory care can be facilitated by:

- the identification of all available clinical venues in combination with case-based conferences.
- developing new and innovative teaching venues, such as a simulated ward or ambulatory care teaching centre.
- a structured approach to teaching and learning.
- developing a volunteer patient ‘bank’ for teaching exercises.
- a staff development programme.
- establishment of a team-based approach to clinical teaching utilizing staff from a variety of healthcare disciplines.

All clinical settings come with their own set of challenges. To attain maximum benefit from all clinical venues, patients, students and tutors must each be appropriately prepared, and the educational objectives must be understood. Various strategies can be used in both the planning and organization of clinical teaching, and a variety of models to manage student–patient interaction in various settings can offer maximum advantage. A variety of teaching styles can be used to provide the widest spectrum of learning opportunities for the students. Teachers need to establish a safe learning environment and encourage students to step outside their comfort zone whilst supporting them to do so. Finally, the most valuable aspect of clinical teaching is for the teacher to step back whenever possible and allow students to learn from patients. After all, who is most invested in the outcomes of excellent clinical teaching and learning?



“The interaction between physician and patient is the interaction between a generalist and a specialist: the doctor is the generalist, and the patient, the specialist.”

Laurence A. Savett, MD, FACP (2019 Creative Health Care Management)

References

- Cox, 1993 Cox K. Planning bedside teaching–2 Preparation before entering the wards. *Medical Journal of Australia*. 1993;158(5):355–495.
- [Cruess et al., 2008](#) Cruess SR, Cruess RL, Steinert Y. Role modelling–making the most of a powerful teaching strategy. *British Medical Journal*. 2008;336(7646):718–721.
- [Dent, 2005](#) Dent JA. AMEE Guide No 26: clinical teaching in ambulatory care settings: making the most of learning opportunities with outpatients. *Medical Teacher*. 2005;2794:302–315.
- [Dent et al., 2001](#) Dent JA, Angell-Preece HM, Ball HM, Ker JS. Using the ambulatory care teaching centre to develop opportunities for integrated learning. *Medical Teacher*. 2001;23(2):171–175.
- [Denton et al., 2006](#) Denton GD, Demott C, Pangaro LN, Hemmer PA. Narrative review: use of student-generated logbooks in undergraduate medical education. *Teaching and Learning in Medicine*. 2006;18(2):153–164.
- Dornan et al., 2019 Dornan T, Conn R, Monaghan H, Gillespie H, Bennett D. Experience based learning (ExBL): Clinical teaching for the twenty-first century AMEE guide. *Medical Teacher*. 2019;41(10):1098–1105.
- [Hanna and Dent, 2006](#) Hanna A, Dent JA. Developing teaching opportunities in a day surgery unit. *The Clinical Teacher*. 2006;3(3):180–184.
- [Irby, 1992](#) Irby DM. How attending physicians make instructional decisions when conducting teaching rounds. *Academic Medicine*. 1992;67(10):630–638.
- [Irby et al., 1991](#) Irby DM, Ramsay PG, Gillmore GM, Schaad D. Characteristics of effective clinical teachers of ambulatory care medicine. *Academic Medicine*. 1991;66(1):54–55.
- [Irby and Wilkerson, 2008](#) Irby DM, Wilkerson L. Teaching when time is limited. *British Medical Journal*. 2008;336(7640):384–387.
- [Latta et al., 2013](#) Latta L, Tordoff D, Manning P, Dent J. Enhancing clinical skill development through an Ambulatory Medicine Teaching Programme: an evaluation study. *Medical Teacher*. 2013;35(8):648–654.
- Lipsky et al., 1999 Lipsky M, Taylor C, Schnuth R. Microskills for students: twelve tips for improving learning in the ambulatory setting. *Medical*

- Teacher*. 1999;21(5):469–472.
- Norcini and Burch, 2007 Norcini J, Burch V. Workplace-based assessment as an educational tool: AMEE Guide No 31. *Medical Teacher*. 2007;29(9):855–871.
- [Peltier et al., 2007](#) Peltier D, Regan-Smith M, Wofford J, et al. Teaching focused histories and physical exams in ambulatory care: a multi-institutional randomized trial. *Teaching and Learning in Medicine*. 2007;19(3):244–250.
- [Peters and Ten Cate, 2014](#) Peters M, Ten Cate O. Bedside teaching in medical education: a literature review. *Perspectives on Medical Education*. 2014;3(2):76–88.
- [Ramani, 2003](#) Ramani S. Twelve tips to improve bedside teaching. *Medical Teacher*. 2003;25(2):112–115.
- [Ramani and Leinster, 2008](#) Ramani S, Leinster S. AMEE Guide no 34: teaching in the clinical environment. *Medical Teacher*. 2008;30(4):347–364.
- Ramani and Orlander, 2013 Ramani S, Orlander JD. Human dimensions in bedside teaching: focus group discussions of teachers and learners. *Teaching and Learning in Medicine*. 2013;25(4):312–318.
- [Reeves et al., 2002](#) Reeves S, Freeth D, Mccrorie P, Perry D. It teaches you what to expect in future ...': interprofessional learning on a training ward for medical, nursing, occupational therapy and physiotherapy students. *Medical Education*. 2002;36(4):337–344.
- [Stickrath et al., 2013](#) Stickrath C, Aagaard E, Anderson M. MiPLAN: a learner-centered model for bedside teaching in today's academic medical centers. *Academic Medicine*. 2013;88(3):322–327.
- [Towle and Godolphin, 2015](#) Towle A, Godolphin W. Patients as teachers: promoting their authentic and autonomous voices. *The Clinical Teacher*. 2015;12:149–154.
- [Wolpaw et al., 2003](#) Wolpaw TM, Wolpaw DR, Papp KK. SNAPPS: a learner-centered model for outpatient education. *Academic Medicine*. 2003;78(9):893–898.

Learning in Urban and Rural Communities

Roger Peter Strasser, Carol Pearl Herbert and William Brainerd Ventres

Trends

- Clinical experience in Academic Medical Centres is constrained by the highly selected patient population and short length of hospital stay.
- Community settings provide greater exposure to common clinical problems and more hands-on experience.
- Learning in rural and underserved urban environments enhances the likelihood of students choosing to practice in these settings after graduation.

Key concepts

- Contextual engagement: involving the local community and cultural circumstances that form the setting for education and healthcare, through active community participation.
- Adaptive expertise: recognizing and responding to changing circumstances and enhancing knowledge and skills through interactive processes.
- Clinical courage: balancing probability, payoff, risk, resources and logistics in clinical decision making and leadership.

Introduction

Learning in rural and urban settings reflects therapeutic patient-doctor relationship development, social accountability (responding to population health needs) and community engagement (active community participation). The 1910 Flexner Report's recommendations ([Flexner, 1910](#)) that medical schools should be university based and that their education programmes should be grounded in scientific knowledge set the trend for medical education in the 20th century. Since then, the first half of undergraduate medical education programmes has been largely classroom based with a focus on the basic sciences, whereas the second half has involved students learning clinical medicine in teaching hospitals where they are taught by physicians who use the scientific method in patient care and research.

By the latter half of the 20th century, growing concern that doctors were too focused on the 'body machine' scientific model led to innovations in medical education, including problem-based learning and community-oriented medical education (COME). Community rotations became more common, although from the student viewpoint they were considered rather like high school excursions; they were enjoyable but 'didn't count for anything of substance'. This situation became problematic as teaching hospitals became increasingly subspecialized, and individual patients required serious illness, rare conditions, or the need for highly technologic interventions to be admitted to one ([Fig. 12.1](#)). Consequently, the range of clinical problems to which medical students were exposed became progressively limited ([Green et al., 2001](#)), and academic subspecialists became the role models with whom medical students increasingly engaged.

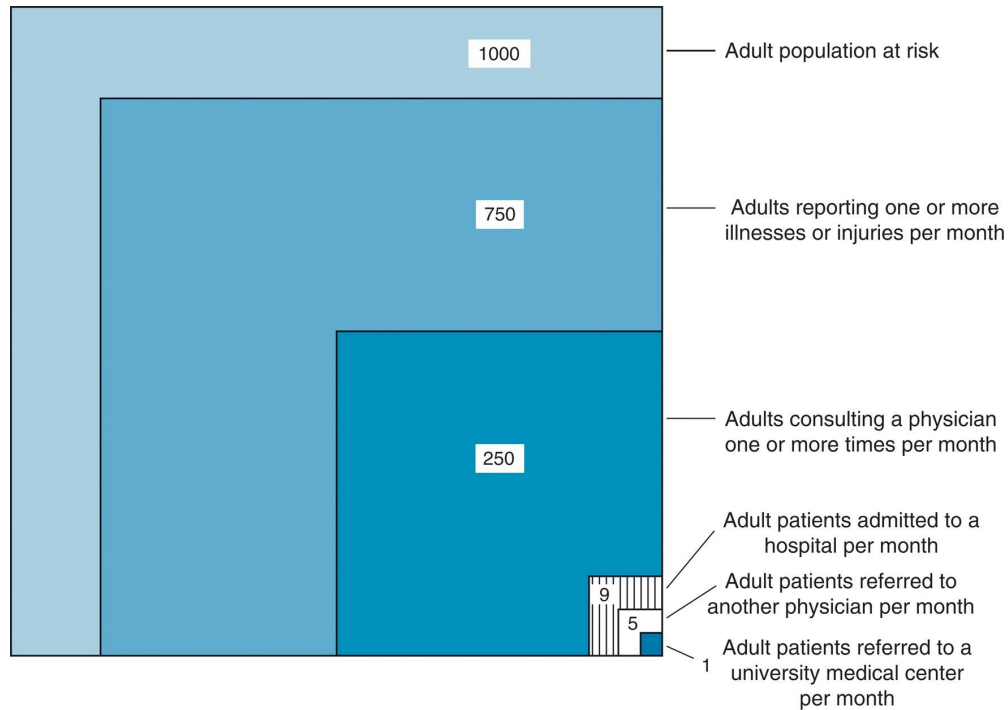


FIG. 12.1 Monthly prevalence estimates of illness in the community and the roles of physicians, hospitals, and university medical centres in the provision of medical care. (From [Green et al., 2001.](#)).

Another consequence of the expanding subspecialty focus in medical education has been that most medical graduates feel disinclined to provide care to vulnerable populations and ill prepared to attend to those affected by poverty, social deprivation, and substance use disorders, as well as Indigenous and other marginalized people. The impact of this trend is the large number of vulnerable rural and underserved urban communities that have limited access to skilled generalist medical care.

Learning medicine in community settings

In the 1960s and 1970s, COME involved medical students learning about community contexts and their impact on the care of patients from different cultural and social backgrounds. Expansion of COME concepts in the 1980s and 1990s led to what came to be called community-based medical education (CBME). The aim of CBME was to enhance students' learning by placing them in a variety of community settings. CBME extended the range of potential clinical learning environments and included mental health services, long-term care facilities, and primary care clinics, as well as hospitals and health services in remote, rural, and underserved urban communities.

Community-engaged medical education (CEME) emerged during the first decade of the 21st century. CEME has stressed the importance of interdependent and reciprocally beneficial partnerships between medical schools and the communities they serve—community involvement is a foundational principle of a medical school's education, research, and community development missions, consistent with tenets of social accountability (see Ch. 52). CEME seeks to address power inequities between medical schools and their community partners by supporting the alignment of students' learning activities with communities' healthcare needs while simultaneously helping students to acquire the skills to practice in target community settings. CEME emphasizes students' learning in context and encourages communities to contribute directly to students' understandings of the local social determinants of health ([Strasser et al., 2015](#)).

Block rotations, prolonged attachments and continuity experiences

Beginning in the 1960s, students in some medical schools undertook short-term clinical placements in family practices in a variety of rural and urban settings. The expansion of these clinical placements was driven by a workforce imperative—the expectation was that experience in these settings would encourage a future interest in rural and urban community practice. Subsequent research justified this expectation ([Bosco & Oandasan, 2016](#)). Community-based clinical placements early in the curriculum enhance student motivation and confidence, as well as raising student interest in becoming a family physician. Prolonged community placements later in the curriculum are suitable for teaching clinical medicine across all specialty disciplines.

The first example of a full-year rural community placement, the Rural Physicians Associate programme (RPAP), began in the United States at the University of Minnesota. Australia's Flinders University established its Parallel Rural Community Curriculum (PRCC) in the mid-1990s. PRCC students live in one rural community and undertake the entire third year of their four-year medical education programme based in family practice offices. Although PRCC learning outcomes are the same as those for students undertaking their third year at teaching hospitals in Adelaide, South Australia, PRCC students consistently outperform their teaching-hospital-based colleagues in end-of-year examinations ([Worley et al., 2004](#)). They are also five times more likely than their peers to choose careers in rural practice, both in primary care and hospital-based subspecialties. The prolonged clinical placements like RPAP and PRCC are known internationally as longitudinal integrated clerkships (LIC; see Ch. 13) whereby medical students: (1) participate in the comprehensive care of patients over time; (2) learn by means of ongoing educational relationships with community-based physicians; and (3) meet core clinical competencies across multiple disciplines ([Strasser & Hirsh, 2011](#)).

Canada's Northern Ontario School of Medicine (NOSM) opened in 2005 and became the first medical school in the world where all students undertake an LIC. Based in family practice, the comprehensive community clerkship (CCC) encompasses the third year of NOSM's 4-year MD programme. Students live in one of the 15 communities in Northern Ontario, excluding the cities of Sudbury and Thunder Bay in Ontario, Canada, where the school's university sites are located. Rather than a series of block rotations, students meet patients in the practice setting such that 'the curriculum walks through the door'. Students experience continuity of care by following these patients and their families, including when cared for by other specialists. CCC students achieve learning outcomes that cover the same six-core clinical disciplines as in the traditional block clerkship rotations at other Canadian medical schools ([Strasser et al., 2018](#)).

A rapidly growing number of research publications demonstrate many positive benefits of LICs for students, communities, and medical teachers. Students achieve higher levels of clinical knowledge and skills, along with heightened confidence and competence. They also experience authentic assessment and feedback, becoming

progressively more responsible for participation in patient care; appreciate community support and relationships; grow in professional identity; and develop interest in careers in family practice. Communities gain in the short term through active participation in medical education; subsequently, they profit through local recruitment of LIC graduates. The benefits of LICs for medical teachers include personal and professional growth and development; recognition and kudos; and succession planning/future recruitment. With few exceptions, patients are very receptive to being attended to by medical students on LICs ([Strasser, 2016](#)). As one colleague recounted, many patients would rather have a student than not. One day, a patient of hers wondered where the student was, noting, *"You're a better doctor when you have a student. I value how you involve me when you teach your students. I learn so much about my own health problems when you do."*

The patient-doctor relationship

A mutually trusting and respectful patient-doctor relationship is central to all high-quality medical care, no matter the setting or discipline. A central premise of this principle is that physicians are never objective observers but always work relationally with patients, both to define problems and find pathways forward. Community-based medical teachers model ongoing personal relationships with patients that develop over time. The focus of these relationships is on caring for people in their home/family/community context rather than simply on organ system problems. This provides the medical teacher with many opportunities to demonstrate compassion and empathy within clearly set boundaries, highlighting particular opportunities for medical learners to treat hard-to-serve populations with dignity and respect.

The patient-centred clinical method, as first defined by McWhinney in 1995 and refined since then by [Stewart et al. \(2014\)](#), provides a framework for doctors to learn to work in partnership with their patients. The components of this method include: (1) exploring health, disease, and the illness experience; (2) understanding the whole person-individual, family, and context; (3) finding common ground; and (4) enhancing the patient-doctor relationship.

Social and cultural dimensions

Increasing attention is being given to historical, economic, and cultural issues and their links to health and health outcomes. Over the course of the past 50 years, concepts including explanatory models of illness, cultural competence, the social determinants of health and adverse childhood experiences have become commonplace across the breadth of medical education. Such concepts are critically important for those working and learning both in rural and underserved urban areas, where working across boundaries of understanding, whether borne of geography, ethnicity, education, language, or income distribution, is a constant fact of daily practice life.

Although the specifics of how best to integrate the social and cultural dimensions of clinical practice into medical education are still in debate, the essence is not. Grounding principles for teaching these dimensions of care include: (1) instruction as to the profound intergenerational influences these determinants have on individual health and the health of communities; (2) exposure to and embeddedness in communities of need during preclinical and clinical learning experiences, highlighting both the sociocultural differences that exist and means of transcending those differences; and (3) shared reflection by learners, facilitated by teachers as to the importance of developing a clinical stance in relation to patients that uses a holistic biopsychosocial approach considerate of context and continuity.

Adaptive expertise and generalism

Adaptive expertise involves innovation in addressing uncertain, complex, and novel situations, balanced with efficiency that draws on routine knowledge. Community settings are particularly well suited as environments for students to learn the skills of adaptive expertise because of the wide range of clinical presentations, including patients with undifferentiated problems. Whether in rural or urban communities, most medical teachers are generalists who provide a wide range of services responding to population health needs as members of health teams. In these contexts, they model adaptive expertise emergently during the regular course of patient visits. Such modelling occurs commonly, as when: (1) negotiating diagnostic plans with anxious or otherwise reluctant patients; (2) coming to shared understandings about adherence to medication regimens; and (3) demonstrating competency in procedures that in other situations might warrant referral. Students and trainees learn to recognize and respond to changing circumstances and enhance their skills as adaptive experts through interaction with patients, medical teachers, and other members of the health team. The ultimate goal is for every medical school graduate to be able to adapt to any situation, regardless of resource availability and clinical need ([Box 12.1](#)).

Box 12.1

The patient-centred clinical method

- Provides a practical framework for doctors to work in partnership with their patients
- Components of this method include:
 1. exploring health, disease, and the illness experience;
 2. understanding the whole person-individual, family, and context;
 3. finding common ground; and
 4. enhancing the patient-doctor relationship (Stewart et al., 2014).

Clinical decision making in the community setting

Providing care in rural and urban communities requires skills different than those needed in most major teaching hospitals. Geographic distance from tertiary care centres, inequities in the availability of human and institutional resources, and the expectation of high-quality comprehensive care in economically constrained environments create circumstances that necessitate approaches to diagnosis and treatment that are at once flexible and innovative.

Clinicians in rural and urban settings learn to use clinical courage as a means of attending to patient problems in these environments. They must be: (1) able to attend to a variety of patient presentations, across all age groups, diagnostic categories, and levels of acuity; (2) comfortable assessing and managing patients in situations with high levels of uncertainty; (3) aware of their professional limits while simultaneously being willing to extend those limits as necessary; (4) confident in sharing the weight of clinical care with other healthcare workers, both in moments of acute need and when reflecting upon past clinical interventions; and (5) creative in managing presenting problems in the moment at hand, with whatever resources are available.

Teaching these skills means including in curricula numerous additional areas for pedagogic attention. These include the use of diagnostic strategies and treatment plans not only guided by standard criteria, but also inclusive of local realities, using distance educational and consultative platforms to help in the management of patients with chronic diseases; effectively incorporating clinical extenders, such as community health workers, to aid in addressing the social and cultural aspects of community-based care; and developing approaches to health advocacy that complement community needs.

Learning with and from others

Given the complexity of healthcare delivery, it is essential that medical learners understand the roles and responsibilities of members of the healthcare team. Learning with other health professional students in community-based settings is essential, but so is role modelling by medical teachers of respectful interactions with other healthcare providers, including nonprofessional community members and family caregivers. Medical teachers in community practices are ideally placed to provide real-world experience to enable team-based care.

Collaborative learning describes such an approach: learners engage with individuals who have knowledge, skills, and experience to share, whether they are professionals or community members. An example of such collaborative learning is the management of an 8-year-old Indigenous girl, diagnosed with gonorrhoea in a family practice office. Mandatory reporting to the child protective services resulted in physical apprehension of the child, interview by police and a social worker, medical examination for physical evidence by a paediatrician trained in sexual abuse identification, and investigation by legal authorities of possible offenders within the immediate family, as well as other caregivers. Intervention by the family doctor ensured that the child was placed subsequently with Indigenous relatives.

Another example is the presentation of a 75-year-old man with memory loss and confusion, brought to the office by his 73-year-old wife. Referral to a Geriatric Assessment clinic confirmed the diagnosis of dementia; a social worker advised the family about options for extended care; a geriatric psychiatrist assessed for depression in both the man and his wife; and an occupational therapist did a home visit to advise on safety improvements. Referral to the local Alzheimer's Society provided peer support for the family. The patient's wife, his primary caregiver at home, received regular follow-up nurse visits in the family practice office.



Tip

Medical teachers in community practices are ideally placed to provide real-world experience and to enable team-based care.

Clinical learning in rural and urban community settings—similarities and differences

When compared with their metropolitan counterparts, rural practitioners may be described as 'extended generalists.' They provide a wider range of services, sustain a heavier workload, and carry a higher level of clinical responsibility, working in relative professional isolation. For medical learners, rural placements offer opportunities not only to experience patients in their home/family/community contexts, but also to appreciate the whole community dimensions that may not be as evident in urban community settings.

Access to healthcare is the major issue in rural areas. Even in countries where most of the population lives in rural areas, resources are concentrated in the cities. All countries experience transport and communication difficulties and they all face shortages of healthcare practitioners in rural and remote areas. Similarly, people in urban settings who are socially and economically disadvantaged often experience challenges to accessing care.

In urban environments, the connectedness of individuals to their communities is a common concern. Although people generally are members of multiple communities, including extended family, neighbourhood, work, religious, recreational and social communities, in cities the members of an individual's social network are often people disconnected from one another. In small rural communities, the various social network members are often the same people. Isolation and alienation may occur more commonly in crowded cities with associated social difficulties. Urban community-based physicians frequently function as key connectors in the social network for such marginalized people. One case example was the doctor who encouraged socially isolated individuals to join the local photographic society.

Although differences exist between rural and urban communities, learning experiences in both settings provides rich opportunities for patient and community engagement, including social and cultural interaction. The opportunities for medical learners to experience the professional rewards and satisfaction of caring for people in a variety of community contexts abound.

Learning medicine where graduates are expected to practice

Some skills are best learned in specific medical settings. For example, insertion of Swan-Ganz catheters is likely best learned in a busy intensive care unit (ICU). However, the day-to-day practice of medicine is best learned by immersion in community settings where learners can observe seasoned clinicians and can participate fully in providing care, whether in offices, hospitals, emergency facilities, long-term care settings, or the homes of patients. Moreover, only through immersion in communities can learners appreciate the context of care—the sociocultural history of individuals and groups, the impact of intergenerational trauma and poverty, and the challenges that exist because of the geographic differences in the availability of healthcare services.

It is important that all learners are exposed to situations where they encounter vulnerable and disadvantaged populations. However, once learners become clear as to the setting where they plan to practice, learning experiences can be targeted, for example, in remote communities or underserved urban settings.

Communication information technologies, whether audio or video, real-time or asynchronous, provide evolving opportunities to enhance care in community settings. Examples include ICU specialists supporting rural emergency care; patients accessing specialists via video; digital photos of skin rashes sent for advice from dermatologists; tele-homecare whereby patients monitor and transmit health data to their care team; telestroke rehabilitation; and Project ECHO (Extension for Community Healthcare Outcomes), described as ‘a collaborative model of medical education and care management that empowers clinicians everywhere to provide better care to more people, right where they live’. This is a true consultant process whereby the subspecialists understand the different contexts in which community-based physicians and their patients function and support local healthcare teams as the front-line providers of care. There is value for all learners being exposed to telemedicine for such clinical consultations, as well for continuing education ([Box 12.2](#)).

Box 12.2

Medical teachers in rural and urban community settings

- Provide care for people in their home/family/community context
- Develop ongoing, respectful, trusting, and compassionate professional relationships
- Facilitate community connectedness and social inclusion
- Use adaptive expertise to address uncertainty, complexity and novel situations
- Respond to the health needs of the population they have the privilege to serve
- Demonstrate clinical courage in medical decision making and leadership

The medical teacher's role

A parallel process exists between the patient-doctor relationship and the learner-teacher relationship, yet community-based physicians often do not recognize the abilities they have as teachers. Drawing on their interactions with patients, community-based physicians can play key roles as mentors for medical students and trainees. Medical learners often recount how clinical experiences in community settings help inspire rural practice career choices and nurture students' professional identity formation. Other members of the health team and members of the wider community also contribute, making the adage 'it takes a whole community to train a future physician' a reality.



"You're a better doctor when you have a student." Patient's comment to her family physician.

Medical teachers in rural and underserved urban settings demonstrate care responding to patients' needs in their home/family/community context, sharing the professional excitement and personal satisfaction of community-based practice. This is important to students and graduates developing a socially accountable orientation, learning to address the health needs of the people that they have the privilege to serve. In addition, the community setting provides medical teachers with opportunities to foster adaptive expertise in their students and to help them reflect on the nature of healthcare as a social good, balancing this orientation with the business aspects of the system. Community-based medical teachers are also well placed to encourage students' exploration of the moral and ethical issues that emerge out of the clinical problems and healthcare challenges they encounter. Although these issues are present in all medical care settings, they are often less evident to students in subspecialized teaching hospital environments where care decisions often are protocol driven.

Practical examples

Northern Ontario School of Medicine: Northern Ontario is geographically vast region in Canada that has a chronic shortage of doctors, a culturally diverse population, and a worse health status than Ontario province as a whole. NOSM was established in 2005 with a social accountability mandate to contribute to improving the health of the people and communities of Northern Ontario and developed distributed community engaged learning (DCEL) as its distinctive model of medical education and health research ([Strasser et al., 2013](#)).

In their first 2 years, students undertake three integrated community experiences (ICE) placements in rural and Indigenous communities each lasting 4 weeks. As mentioned previously, third-year students undertake the CCC in groups of two to eight living in one of 15 communities, excluding Sudbury and Thunder Bay, to learn core clinical medicine from a family practice and community perspective. Much of the CCC curriculum is devised in partnership with the host communities, including active involvement of medical teachers ([Strasser et al., 2018](#)).

The ICE placement in first year is an Indigenous cultural immersion in which pairs of students are placed in one of 36 Indigenous communities to support students in the development of culturally safe care for Indigenous patients. The students learn from the communities about the history, tradition, culture, social and health issues, and begin to develop community relationships as they explore the context of Indigenous healthcare in Northern Ontario. As a final requirement of the placement, students prepare a reflective presentation that is shared first with their host community and then, upon return to the university, with classmates and faculty. Although there are notable exceptions the overall evaluation from students is that the cultural immersion experience is worthwhile, has lasting effects on their knowledge and practice, and provides an effective learning environment.

In second year, NOSM students complete two 4-week ICE placements in small remote and rural communities (usually population <5000). This is a clinical experience whereby the students are attached to the local doctors and health team, and helps students prepare for the full year CCC principal clinical year.

Inner city Vancouver, British Columbia, Canada: Since its inception in 1969, REACH Community Health Centre ([Tonkin, 1979](#)) has been a community teaching site in Grandview-Woodland, a neighbourhood on Vancouver's east side, governed by a board of directors that includes community members, patients, and healthcare professionals. Initially, REACH was established by the University of British Columbia department of paediatrics to provide child health experience as the hospital outpatient departments were phased out following the advent of Medicare. Unusual at the time, full-service family practices were established with alternately funded physicians and early adoption of on-site team-based care, including nutritionist, pharmacist, health educator, advanced practice nurses (before nurse-practitioners were defined as a discipline), and specialty consultation in both paediatrics and psychiatry. An evening youth clinic, staffed by volunteer medical, nursing, and other health professional

students, served youth from across the city, providing full medical care, including contraception and pregnancy services. A dental clinic initially served children but expanded to provide adult dental care, with emergency coverage at nights by the REACH physician on-call. Innovative special programmes were developed in response to identified community needs; examples have included a toy lending library, translation services, sexual abuse assessment and teen pregnancy programmes.

Fifty years later, REACH continues to thrive, now under Vancouver Coastal Health but still governed by a community board. Many of the medical students and family practice residents who have experienced REACH as a well-functioning healthcare team in a community-engaged organization have gone on to work in similar settings.

It is essential in community-based urban programmes that the educational mission is strongly supported, alongside clinical care. Competency-based objectives and assessment processes ensure that learners do not view placements as 'field trips' but are fully engaged with patients and families and learn how to work relationally with communities to determine and respond to needs.

Ateneo de Zamboanga University School of Medicine (ADZU SOM): ADZU SOM is in Zamboanga City, the Philippines, and the regional healthcare centre for Western Mindanao and the Sulu Archipelago, which is one of the most underserved areas in the South Pacific and has poor health statistics and chronic health workforce shortages. At ADZU SOM, biomedical aspects of the treatment of disease are taught within the social, cultural, political and community environments. Students learn that whereas the treatment of immediate medical symptoms is biomedical, the production and ongoing integrity of individual health and community health status are inextricably linked to broader social conditions. The medical education programme is driven by a social determinants of health model with a view to ensuring that students learn to be responsive to community healthcare needs.

Community engagement occurs throughout the 4-year programme. Commencing in the first year, students develop community projects and do much of their clinical learning in small rural communities. This engagement culminates with students living in these same small communities for the entire fourth year while they implement the community projects that they started developing in their first year. The student-initiated projects are intended to solve major community health issues, drawing heavily on the social capital available in the community. Examples include: building pit latrines; improving access to potable water; developing solid waste management policies for local governments; developing cottage industries to generate income; creating home vegetable gardens; and constructing a canoe to transport children across the lake to school (Cristobal & Worley, 2012).



Tip

Drawing on their interactions with patients, community-based medical teachers play key roles as mentors for medical students and trainees.

Research

Research is essential to improving health and healthcare. For physicians and other healthcare practitioners, everyday interactions with patients raise questions. At times these questions can be answered by reviewing the literature and/or consulting colleagues; at others, answers to questions are not known, and research may be seen as a systematic response. Recognizing this, it is important that medical students and trainees learn to see research as integral to everyday clinical practice. Community-based medical teachers are well placed to introduce medical learners to practice-based research. This is consistent with Flexner's expectation that medical teachers routinely use the scientific method in their work with patients.

Summary

There is a growing need for high-quality medical care in a wide range of rural and underserved urban settings, particularly those involving vulnerable populations affected by poverty, social deprivation, and substance use disorders, as well as Indigenous people and other marginalized populations. Consequently, there is a need for medical education in these settings by which medical learners come to appreciate the emotional and intellectual satisfaction of community-based practice and, at the same time, achieve important learning outcomes associated with contextual engagement, adaptive expertise and clinical courage.

Medical teachers in rural and underserved urban settings play important roles in challenging medical learners to develop confidence and competence in such areas as managing uncertainty in anxiety provoking situations; exploring creative solutions when resources are limited, in collaboration with patients, families, communities, and the whole health team; and contributing to healthcare that improves the health of the people that they serve (Fig. 12.2).

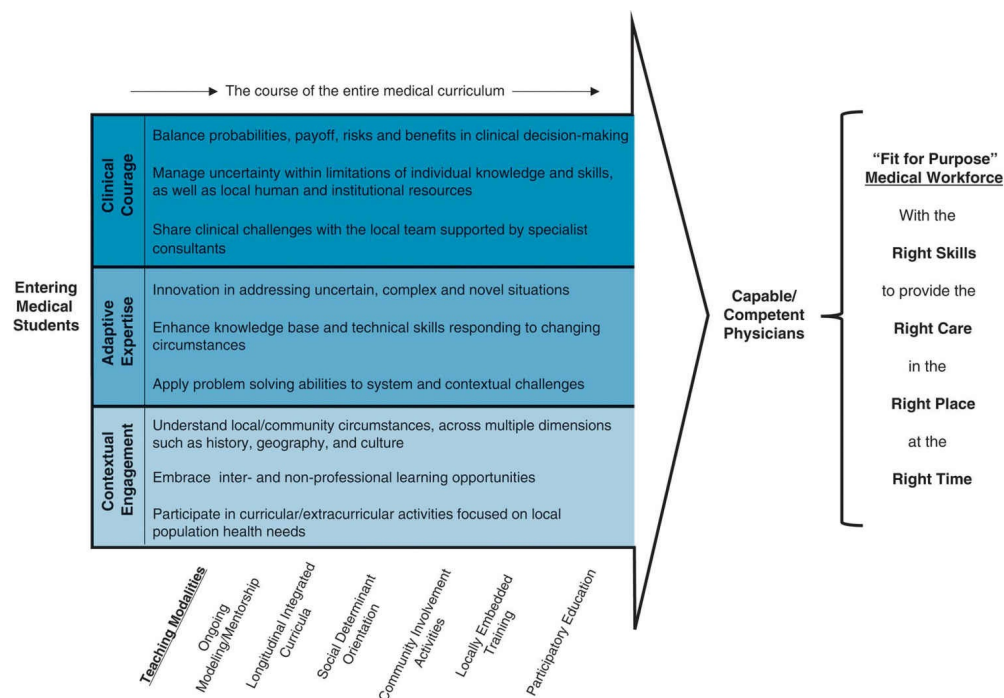


FIG. 12.2 Rural and urban physician education: a graphic synopsis.

References

- Bosco and Oandasan, 2016 Bosco C, Oandasan I. *Review of family medicine within rural and remote Canada: education, practice, and policy* Mississauga, ON: College of Family Physicians of Canada; 2016; 2016.
- Cristobal and Worley, 2012 Cristobal F, Worley P. Can medical education in poor rural areas be cost-effective and sustainable: the case of the Ateneo de Zamboanga University School of Medicine. *Rural and Remote Health*. 2012;12:1835 (Online) 2012 Available: <http://www.rrh.org.au>.
- Flexner, 1910 Flexner A. *Medical education in the United States and Canada: a report to the Carnegie Foundation for the advancement of teaching*. Bulletin Number Four New York, NY: Carnegie Foundation for the Advancement of Teaching; 1910;1910.
- Green et al., 2001 Green LA, Fryer Jr GE, Yawn BP, Lanier D, Dovey SM. The ecology of medical care revisited. *New England Journal of Medicine*. 2001;344:2021–2025.
- Stewart et al., 2014 Stewart M, Brown JB, Weston W, McWhinney IR, McWilliam CL, Freeman T. *Patient-centred medicine: transforming the clinical method* third edition Boca Raton, Florida: CRC Press, Taylor and Francis Group; 2014.
- Strasser, 2016 Strasser R. Students learning medicine in general practice in Canada and Australia. *Australian Family Physician*. 2016;45(1–2):22–25.
- Strasser and Hirsh, 2011 Strasser R, Hirsh D. Longitudinal integrated clerkships: transforming medical education worldwide?. *Medical Education*. 2011;45:436–437.
- Strasser et al., 2018 Strasser R, Hogenbirk JC, Jacklin K, et al. Community engagement: A central feature of NOSM's socially accountable distributed medical education. *Canadian Medical Education Journal*. 2018;9(1):e33–e43.
- Strasser et al., 2013 Strasser R, Hogenbirk JC, Minore B, et al. Transforming health professional education through social accountability: Canada's Northern Ontario School of Medicine. *Medical Teacher*. 2013;35:490–496.
- Strasser et al., 2015 Strasser R, Worley P, Cristobal F, et al. Putting communities in the driver's seat: the realities of community engaged

medical education. *Academic Medicine*. 2015;90:1466–1470.

[Tonkin, 1979](#) Tonkin RS. The REACH Centre- Its history and work (1969-76) I Historical background and programme description. *Canadian Journal of Public Health*. 1979;70:199–206.

[Worley et al., 2004](#) Worley P, Esterman A, Prideaux D. Cohort study of examination performance of undergraduate medical students in community settings. *British Medical Journal*. 2004;328:207–209.

Learning in Longitudinal Integrated Clerkships

David A Hirsh, Tara A Singh, Yamini Saravanan and Lucie Kaye Walters

Trends

- Longitudinal integrated clerkships (LICs) are a successful model of clinical education growing rapidly internationally. A diverse literature documents LIC's educational, institutional and societal outcomes in academic hospital settings and community settings.
- LICs align educational delivery with clinical care delivery.
- LICs address four imperatives: to ensure educational structures align with the empirical sciences of learning, to address the learning environment and stem ethical erosion, to improve faculty experience of teaching and support health systems, and to meet patient and societal needs.
- LICs are empirically grounded in the 'learning sciences' to provide 'educational continuity' through the continuities of patient care, faculty supervision, and the clinical curriculum.
- In LICs, students accrue learning and professional benefits, have high satisfaction, and offer benefits to the venues in which they work. Students' authentic and meaningful roles in care and students' commitment and sense of duty drive their learning.

Key concepts

- Educational continuity: an educational principle, grounded in the learning sciences, that uses the power of relationships, time and meaningful roles, to foster knowledge, skill and professional formation; educational continuity subsumes a set of 'subcontinuities' —learning relationships with patients, supervisors, peers, one's community and with the curriculum itself.
- Longitudinal integrated clerkships (LICs): structures of clinical education, grounded in the learning sciences, that address gaps in traditional block rotations (TBRs); in LICs, students attain clinical competency across multiple disciplines simultaneously over time, providing meaningful care for a diverse cohort of patients with close oversight by supervising physicians.
- The learning sciences: diverse fields of education, cognitive and social psychology, neurobiology, and information technology/artificial intelligence that advance the empirical basis of human development, memory and retention; two empirically derived domains underpin educational continuity and LICs: spacing (learning through repeated experiences over time) and interleaving (learning multiple domains simultaneously).

Introduction

Educational, health system and governmental leaders are reenvisioning health professions education guided by powerful learner, patient, faculty, institutional and societal imperatives. The current processes and outcomes of medical education continue to invite critical questions: What is the ultimate aim of medical education, whom should it serve, and who decides? ([Hirsh & Worley, 2013](#)).

Practical questions about the design of clinical medical education stand out. How can medical education best foster learning and retention of science? How can educators ‘translate’ science into evidence-based practice? How can educational design facilitate the developmental trajectory of learners? How can medical education promote learners’ humanism, empathy, cultural humility, curiosity and inquiry? How can medical education improve the quality, safety, equity, accessibility and cost of care, social accountability, and community engagement? What pedagogic methods and educational structures best meet learner, teacher, patient, institutional, and societal needs?

From the time of the first known LIC in 1971 to the present, leaders have sought to address the core questions and imperatives facing medical education and care delivery by developing new structures of educational delivery. The creators of LIC models intend specifically for structures of clinical education to benefit learners maximally, while addressing patient, health system, and population needs. Central to the LIC movement is the notion that transformation of the processes and outputs of clinical education should benefit and advance the processes and outputs of clinical delivery. LIC planners are clear that the model itself is not the goal—progress in education and care delivery is the goal. LICs are thus means, not ends. LICs are enactments of educational principles to serve individual (learner, teacher, patient), organizational (office practice, institution), and community (geographic, cultural) ends ([Hirsh & Worley, 2013](#)). University and health system leaders who advocate for LICs seek explicitly that the model drives continuous quality improvement (CQI) of education and care delivery alike.



“Educational and care delivery transformation must progress together and inexorably.”

To characterize how such beliefs led to actual plans and products, this chapter reviews the definition, history, rationale, and structures of LICs; summarizes data and literature about these models; and presents practical tips for developing and sustaining LICs.

Defining Lics

The link from foundational values to the LIC definition is manifest in the framework of educational continuity ([Hirsh et al., 2007](#)) and the power of relationships as formative forces of education and caregiving. The definition of LICs arose from a consensus conference following the international Consortium of LICs meeting in Cambridge, Massachusetts (USA) in 2007. Educational scholars and leaders characterized LICs by considering all LIC-like programmes described in the medical literature. LICs are defined as the central element of clinical education whereby medical students:

1. participate in the comprehensive care of patients over time,
2. engage in continuing learning relationships with these patients' clinicians, and
3. meet the majority of the year's core clinical competencies, across multiple disciplines simultaneously through these experiences ([Walters et al., 2012](#)).

The consensus definition does not dictate a length of an LIC, only the 'majority' of the year's core clinical competencies, but minimum duration for LICs has educational grounding. The length expectation arises from conceptualizing how much experience a learner needs to be oriented to, affected by, and able to contribute to a learning and practice environment. Extensive experience over decades, across a wide array of programmes, suggests that LIC benefits accrue after a minimum LIC length of 6 months, and longer LICs may offer more benefits.

History

In 1971 the government of Minnesota (USA) determined that the state's medical school needed to better fulfil the state's workforce needs. Too few graduates were working in rural areas, and too few were choosing the specialty disciplines that would serve the population health needs. Primary care was in short supply, and the state sought a remedy. In response, educational leaders developed the Rural Physician Associate Program (RPAP) and challenged longstanding notions about medical education delivery:

1. Eschewing traditional block rotations (TBRs) in the core clinical (third) year of US medical school in favour of a single multidisciplinary immersive experience;
2. Situating medical students in ambulatory office venues outside academic teaching hospitals;
3. Dispersing medical students to live and learn in small communities and enlisting clinicians as educators rather than employed academic physicians with research duties;
4. Situating students in family medicine rather than traditional specialties; and
5. Ensuring students deeply engaged with a diverse array of patients in acute, chronic and preventive care.

The RPAP model succeeded. Learner outcomes and workforce outcomes clearly achieved the university's and the government's goals ([Verby et al., 1991](#)). Other dispersed medical student education programmes followed in Washington, Michigan, Hawaii, South Dakota and North Dakota. Programmes were parts of major research-oriented universities and universities with workforce missions. Nearly 50 years of data from RPAP and other programmes demonstrate impressive outcomes that meet student, institutional and community goals.

In 1993 educators created the first known urban LIC: the Cambridge Community-based Clinical Course in Cambridge, England. This programme again demonstrated the feasibility and success of the LIC concept at a research-oriented university. Like its predecessors, the programme showed excellent programmatic outcomes for nonrotational, ambulatory training in the community, in this case, an urban community. Building on Cambridge's UK success, and connecting to the rural mandate of the early LICs in the United States, Flinders University in Australia developed its LIC in 1997. That model, the Parallel Rural Community Curriculum (PRCC), paved the path of LICs in Australia and became an engine of LIC research. PRCC outcomes directly advanced a critical governmental workforce mandate in Australia, the creation of the Rural Clinical Schools funding. Unsurprisingly, now nearly half of all schools across Australia run LICs. Some, such as the University of Wollongong in New South Wales, offer the LIC to their entire class.

The rapid growth of LICs appears to trace to the development of the model in two urban academic schools in the United States. In 2004 Harvard Medical School launched

the Cambridge Integrated Clerkship (CIC) in Cambridge, Massachusetts. Like its namesake in England, the model thrived, but unlike the original LICs in the United States, United Kingdom, and Australia, Harvard's programme relied on specialist clinicians. The CIC's goals did not relate to workforce but to advancing student's clinical and scientific learning and professionalism. Robust data and a series of publications outlined the model's principles, structure, and results and further propelled the LIC movement ([Hirsh et al., 2007, 2012](#); [Ogur & Hirsh, 2009](#); [Ogur et al., 2007](#)). Subsequently, a collective of educational leaders and executives dedicated to advancing clinical medical education formed the international Consortium of Longitudinal Integrates Clerkships (CLIC) organization and had its first meeting in Cambridge, Massachusetts in 2007.

Following Cambridge (USA), another breakthrough arose when the University of California San Francisco (UCSF) created the first LIC situated in a highly subspecialized, research intensive, quaternary medical centre. That programme, Parnassus Integrated Student Clinical Experiences (PISCES), extended the model's venues and reach, demonstrating success in the most subspecialized clinical settings ([Poncelet et al., 2011](#)). Multiple publications characterize the PISCES model's processes and outcomes.

Thereafter, Columbia University, the University of North Carolina, Duke University, and universities in Alberta, British Columbia and Ontario, alongside other well-regarded institutions in North America and Australia, applied LIC pedagogy to new settings and with new institutional goals. Many new LIC programmes (e.g., Columbia) integrate health system goals into the model—simultaneously providing high-level clinical education alongside management, leadership and training in clinical delivery redesign.

Northern Ontario School of Medicine became the first school in North America to use the LIC design for all of its students. Other new medical schools followed. Medical schools are also scaling and expanding LICs within their institutions; for example, the University of South Dakota expanded the LIC to their entire class; the University of Minnesota created urban LICs, and specialty-enhanced LICs (e.g., to advance paediatric training), and UCSF created two LICs at Kaiser Permanente (KP), a large health system renowned for clinical delivery transformation and quality. UCSF has also expanded their quaternary hospital LIC and added a rural programme. Building on the success of the two UCSF-KP LICs in northern California, KP launched its own medical school in southern California wherein all students will undertake LICs over more than one year. Worldwide, LICs are growing rapidly with more than a doubling of the number of known institutions creating LICs between 2009 to 2014 and more than another doubling in the time since.

Rationale

LICs are emerging in the context of serious concerns facing educational, clinical, health system, and governmental leaders. LICs also arise after a time of significant progress in the sciences of learning and during an era demanding improved healthcare delivery. Consequently, four imperatives establish the 'case for change' driving educational transformation in general and LIC transformation specifically: learning, professional, health system and societal imperatives.

Learning imperatives

Empirically derived sciences of learning should inform our education structures. Beyond guiding pedagogic practices, the learning sciences demonstrate educational structures that best support learning and retention ([Poncelet & Hirsh, 2016](#)). Two domains of science stand out for the weight of evidence and their connection to clinical education redesign: spacing and interleaving. Spacing refers to serially revisiting learning (content or skills) with time between to consolidate, reflect upon and even, 'necessarily forget' learned material. Spacing learning over time improves retention. Spacing learning drives the 'longitudinal' concept of LICs. Interleaving refers to studying multiple discrete areas simultaneously. Imagine, for example, learning multiple languages at once or the familiar situation of taking several different academic courses at once. Interleaving improves retention and provides benefits independent of and complimentary to the spacing effect. Interleaving drives the 'integration' concept in LICs.

Taken together, the sciences of longitudinal (spaced) and integrated (interleaved) learning, alongside concepts from relational, social, and workplace learning sciences, led to the principle of educational continuity ([Hirsh et al., 2007](#)) that underpins LICs. Educational continuity establishes the power of relationships, time and meaningful roles, to foster knowledge, skill and professional formation ([Fig. 13.1](#)). The factor of time changes the nature of experience and relationships as educational forces. Time affords students more and closer engagement with patients and with their medical and interprofessional faculty than short and more anonymous teaching structures allow. Time affords iterative multisource feedback and iterative self- and group reflection. Each student's trajectory differs, and continuity of the educational environment allows for programmes to maintain standardization with the flexibility to individualize ([Latessa et al., 2017](#)). Educational continuity in the clinical context sets up a series of 'subcontinuities': continuity of the care (of patients and populations), of supervision (by faculty and the interprofessional team), of the curriculum and with peers. This framework also fosters a continuity of learners' idealism—the core human values that drive personal and professional growth.

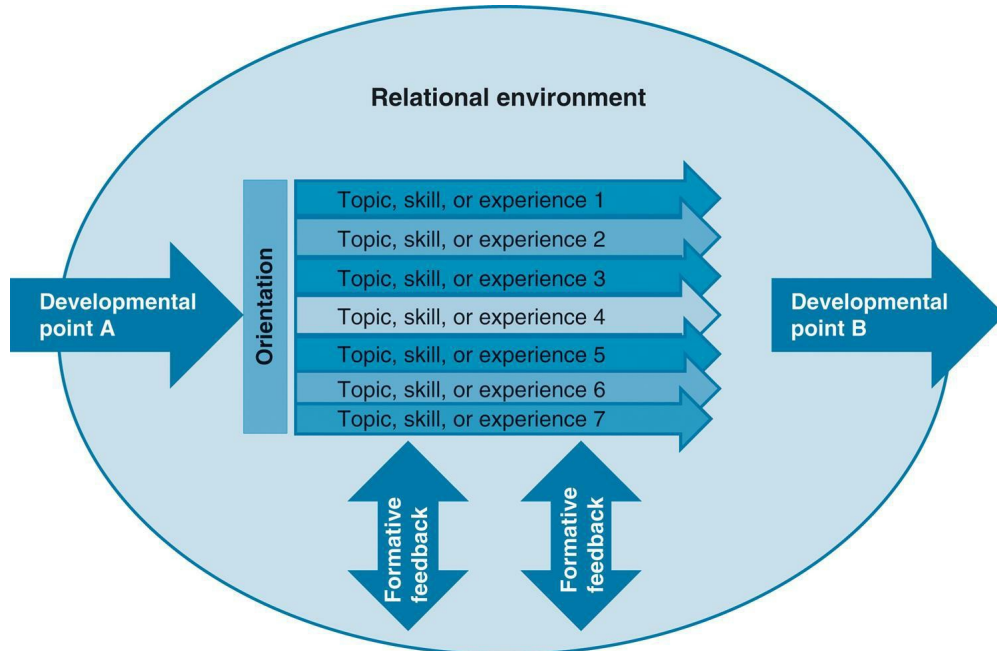


FIG. 13.1 Educational continuity.



"With educational continuity, faculty oversee students over extended time. Faculty say, 'Time together matters—it means I am teaching 'my' student and not just 'a' student'."

Professional imperatives

Educational structures should attend deliberately to the hidden curricular influences (see Ch. 6) that can adversely affect the learning environment, students' learning and professional development, and student wellbeing ([Hirsh et al., 2012](#); [Hirsh, 2014](#)). Structural, tacit, and overt forms of objectifying or diminishing learners, patients, coworkers and populations threaten learning and professional practice. Students receive powerful messages if they are demeaned but also when they are relegated to anonymity or to passive or insignificant roles. LIC leaders seek to address the hidden curriculum and reconstitute medical education such that: (1) the most able and professional teachers, clinicians, and scientists oversee students' learning and growth; and (2) learning occurs in educational structures that support students' development through meaningful, engaged and authentic roles in care ([Hirsh & Worley, 2013](#); [Hirsh et al., 2012](#)).

Health system imperatives

Health systems, from individual teachers and clinicians to offices and institutions as a whole, need to change the educational formulation from 'student as burden' (or bystander) to 'student as benefit'. With the affordance of relationships and time, students can improve patient care—its quality, safety, access, efficiency and equitable delivery. LIC students see the system as they 'walk in their patients' shoes' across venues and can serve to improve office or health system processes. Students may complete longitudinal projects for their offices or health system, analyse population health needs, share (even create or fix) IT resources, serve as health advocates for patients, or provide patient or community outreach. LIC students' work can help health systems satisfy patients and attract patients to care ([Beard et al., 2019](#)). The LIC design also benefits medical schools that are expanding enrolment to address physician workforce shortages. LICs create opportunities to place students in communities that cannot support TBRs. Opening new venues for teaching and learning creates 'mission-driven' growth and connects health system imperatives to societal imperatives. Healthcare imperatives argue for education that improves care and care delivery to individuals and populations, not only after students graduate, but in real time—as a consequence of the educational model.

Societal imperatives

Medical education should attend to workforce and community needs. To meet this call, LIC leaders advocate for education that seeks excellence through innovation, CQI, social accountability, and community engagement. LIC leaders aim to address underserved regions (e.g., urban, rural, remote), underserved disciplines and specialties (whether surgical/technical, specialist, primary care, or psychosocial) and underserved populations. By transforming and supporting educational relationships, LIC leaders seek to create structures of medical education that address the goals, inputs, processes, *and outputs* of our educational system.

Model types

With the rapid expansion of LICs, research is defining LIC typologies. Typologic clarity invites research that distinguishes LICs from LIC-like programmes and characterizes which LIC elements foster what learning and professional impacts, in what context, and why. Typologies also clarify the patient, faculty, office/institutional, and community impacts of LICs. As educational leaders are already inventing 'next generation' LICs, two current LIC model types uphold the 2007 international CLIC consensus definition: the generalist models and the multispecialty 'streams' models.

Generalist model longitudinal integrated clerkships

In generalist model LICs, the programme situates students in general practice or family medicine offices. In these settings, the rich diversity of clinical experiences ensures students meet scholastic objectives. Students' principal preceptors are generalists who support students' authentic and meaningful roles in care as they build a diverse 'cohort' of patients to follow longitudinally. To meet requirements, generalist models may add specialty experiences to precede or follow the LIC time, or both. In addition, students in rural LICs meet specialists who 'come to town' to provide clinical service and lead teaching sessions.

Most generalist model LICs reside in rural and remote settings, but the model may exist in any centre where doctors work in both the community and hospital setting. The key is for students to work with their supervisors across ambulatory and inpatient contexts. Because the students are often dispersed into the community and immersed in the generalist practice, some leaders refer to generalist model LICs as 'dispersed-immersed' models.



Generalist faculty explain, "Students have meaningful roles in care as 'the curriculum walks in the door'."

Multispecialty 'streams' model longitudinal integrated clerkships

The LICs at Harvard and UCSF use a different structure. In these multispecialty models, the students attend multiple ambulatory specialty clinics in the same week, seeing their individual specialty preceptor's patients. With their preceptors, the students build the required diversity in their 'cohort' of patients in each of these disciplines simultaneously. Faculty and students together build the students' patient cohort by considering multiple factors: (1) curricular goals (to create a diverse patient panel with the core conditions the curriculum requires students engage); (2) patient needs (chronically ill, critically ill, and disenfranchised patients who benefit from student longitudinal involvement); (3) practicality (patients whom the student can actually follow); and (4) patient consent. Faculty and students consent patients verbally, explain the programme and set expectations.

In the multispecialty streams model, students follow their patients through outpatient, emergency and inpatient contexts throughout the health system, engaging other specialists. The specialty streams chosen, the size of the student cohort in each discipline, and the amount of time dedicated each week or fortnight depend on each school's objectives. The literature about the Harvard and UCSF LICs outlines the weekly schedules ([Ogur et al., 2007](#); [Poncelet et al., 2011](#)).

The generalist model and multispecialty streams model LICs create similar affordances that may account for their similar outcomes. In each model, students have ongoing educational continuity and relationships with their patients, peers, preceptors, and interprofessional colleagues, the institutional environment, core scholastic themes and the community ([Latessa et al., 2017](#)). LICs' relational continuity supports students' personal and professional development differently than can occur in time-limited, discontinuous TBRs.

Impact of longitudinal integrated clerkships

For students

LIC student examination performance consistently compares favourably to students in TBRs independent of content, assessment modality (written or practical) or test structure (national boards or school-based exams) (Poncelet & Hirsh, 2016; Walters et al., 2012). LIC students express higher satisfaction, greater confidence in high-order clinical skills, dealing with uncertainty, clinical scepticism, self-direction, working with diverse populations, reflective practice, and understanding healthcare systems (Greenhill, Richards, Mahoney, Campbell, & Walters, 2018; Hirsh et al., 2012). LIC students contribute legitimately to patient encounters (Ogur & Hirsh, 2009; Snow et al., 2017; Walters, Prideaux, Worley, & Greenhill et al., 2011). Students feel more work-ready (Roberts et al., 2017), and emerging data suggest greater faculty entrustment of LIC students compared with TBR peers.

For doctors and patients

Faculty value LIC students' contributions to care, feel increased ownership of student learning, and report high levels of satisfaction with this model of teaching (O'Brien et al., 2016; Snow et al., 2017). Faculty affirm that longitudinal education facilitates LIC students moving from peripheral roles (e.g., sharing information, providing support to patients) to more central doctor-like roles (e.g., taking responsibility, explaining management to patients) (Poncelet & Hirsh, 2016; Walters et al., 2011). LICs afford increased connectivity with professionals, preparedness for practice, effective interprofessional work, perceptions of depth in clinical skills, cultural awareness, and understanding health systems (Roberts et al., 2017; Hirsh et al., 2014). Rural general practitioners and hospital specialists describe strong interest in participating in LICs because of student recruitment to their disciplines.

Patients who develop longitudinal relationships with LIC students benefit from the trust and mutual respect that develops over time (Flick et al., 2019; Hirsh et al., 2014). In urban LICs, patients describe greater access to care, noting students are easier to reach and take more time to answer questions. Patients report that students improved the quality of their care through education about the disease and therapy (Beard et al., 2019; Flick et al., 2019). Gaufberg et al., 2014 demonstrated that LIC students' strong patient-centred attitudes endure beyond residency.



Patients ask, "Can I have my own personal medical student?"

For organizations

Students facilitate communication of important information across the health system,

and patients benefit from students serving as guides and ‘interpreters’ of care ([Ogur & Hirsh, 2009](#)). Through meaningful roles and time, students extend the reach and oversight of the care team and create extended and enriched therapeutic relationships. Medical practices with LICs experience many affordances: recruitment of residents and clinicians; enhanced access to information technology (and students' command of it); the inspiration and capacity to commence research and quality improvement activities; opportunities and the status from partnering with a medical school, and in some programmes, financial support for teaching and clinic infrastructure ([Snow et al., 2017](#)). In hospitals with limited previous student placements, LICs have driven organizational change, interprofessional presentations, journal clubs and quality improvement processes ([Somporn et al., 2018](#)).

For communities

For universities with a social accountability mandate, LIC transformation drives community engagement. Institutional involvement with community members, leaders, and policymakers facilitates codesigned, mutually beneficial, educational and care delivery planning ([Somporn et al., 2018](#)). In Canada, a study demonstrated that the LIC model created significant financial benefits, fostered economic development, and increased social capacity ([Hogenbirk et al., 2015](#)).

LIC students demonstrate significant public orientation, and many choose to contribute to their community while they study. LICs influence the perspectives of the medical students who undertake them, with alumni studies demonstrating increased participation in social justice and health advocacy (50%) compared with their TBR peers ([Gaufberg et al., 2014](#)). In LICs with a social accountability mandate, greater proportions of graduates choose to enter primary care and work in rural regions.

Developing and sustaining longitudinal integrated clerkships

Leaders developing LICs must connect to institutional and practice contexts. At the outset, LIC planners must engage significant numbers of relatively independent stakeholders and properly estimate the time required to manage change. As leaders move from conceptual design to granular detail, they must balance inclusive (slow) planning and more directive, just-in-time (rapid) decision-making. To limit unintended consequences, we recommend using external LIC experts (to test feasibility) and ‘informed insiders’ (to test acceptability) of decisions. Context and organizational frameworks will guide which LIC model to adopt (generalist or multispecialty) and how to adapt the model for learner and clinical needs.

LICs must have excellent staff. The staff maintain logistical processes to adapt student schedules in response to the dynamic health system and support students to navigate the interface between medical school and health services. Staff have an important front-line role in supporting students’ wellbeing. LIC leaders should seek staff who are excellent communicators, organized, meticulous and patient. LICs may need staff to engage a wide array of roles: accessing campus-based education and assessment, recruiting faculty, providing professional development, supporting information technologies and distance learning, recruiting students, and facilitating travel and accommodations. Staff leaders must be able to manage unexpected challenges.

Effective learning relationships are the core of LICs. LIC preceptors report overwhelmingly positive feedback even as they must balance clinical service requirements with students’ learning needs ([Snow et al., 2017](#) and [Walters et al., 2011](#)). With longitudinal relationships, patients value increased involvement of students, but faculty must intentionally adopt systems to manage consent and confidentiality, especially for disenfranchised and vulnerable patients. Fortunately, service pressures are reported to be less in LICs compared with TBRs as clinicians and students build collaborative relationships over time. The literature documents that LIC students progressively create a legitimate contribution to the clinical outputs without decreasing in faculty ‘throughput’ ([Walters et al., 2012](#); [Walters, 2014](#)).

Faculty must recognize that they are not responsible to teach students ‘the whole curriculum.’ Faculty development should support faculty to be guides who facilitate students’ access to patients, model the professional role, set high standards for learning, and increase student responsibility over time. Clinical faculty value connections to the school—when having opportunities to contribute to and influence curricula and assessment and when receiving prompt and supportive interventions if students develop academic or personal difficulties.

Students’ continuity in the clinic enables student consulting sessions, clinician rostering, and student assessment to be incorporated into routine operational duties of the medical practice. If practices have room capacity, students should commence patient consultations before their clinical supervisor joins the consultation. This ‘parallel

consulting' technique may require changes to reception and staff workflow and to clinic appointment scheduling ([Walters, 2014](#)). At the outset, health services must review policies to ensure students understand their roles and responsibilities within the care settings.

Relational continuity can provide students with the personal resources to experience transformative learning, but such learning experiences may be uncomfortable. Programme leaders need to recognize students feeling 'consciously incompetent', help students recognize their development trajectory, and work together proactively to support students' resilience. Faculty should remember—and explain to students—that when gaps in knowledge or skills arise, the longitudinal design allows time for creating individualized learning experiences. Programme leaders should teach explicitly about the merits of facing difficulties and help students overcome challenges with graded support. Peer support and connections to 'near-peer' LIC graduates also help contextualize LIC students' experiences.

Communities hosting students in LICs believe that they make important contributions to medical education, and they may expect in return to have a secure, high-quality medical workforce in their community in the future. This expectation can create a weighty responsibility for institutional and programmatic leaders and for individual students. Institutional leaders should cultivate realistic community stakeholder expectations. Early and ongoing community representation gains and sustains community support for LICs ([Poncelet & Hirsh, 2016](#)).

The move to develop and maintain an LIC marks a deliberate investment driven by the goal of improving educational processes and outcomes (e.g., learning, the learning environment, work-readiness, humanistic comportment, career choice). When first articulating the need for change and considering LICs as a possible solution, leaders should create the plan to evaluate outcomes against goals. Rigorous scholarship allows determination of successes and ongoing needs, guides refinements, disseminates lessons learned, and advances further innovation. Exploratory and explanatory research using realist evaluation should describe more fully what works, for whom, in which context, and why.

Summary

In generalist models and multispecialty models, across nations and care delivery contexts, LICs are thriving. For decades, the literature has demonstrated the LIC model's success and reach. LICs support learning through educational continuity and spacing and interleaving learning. Students' relationships and authentic and meaningful roles foster their learning and their care across time. Medical students are fundamentally changed by the LIC experience, and many emerge transformed at a very human and personal level. So, too, are the students' teachers and patients.

Evidence of LIC's impact is well advanced, but the model is just one step. The successful story of LICs teaches us to use core values and educational science to develop new educational prototypes—to advance inexorably the clinical learning and care our society needs.

References

- Beard et al., 2019 Beard AS, Candy AE, Anderson TJ, et al. Patient satisfaction with medical student participation in a longitudinal integrated clerkship: a controlled trial. *Academic Medicine*. 2019;95(3):417–424.
- Flick et al., 2019 Flick RJ, Felder-Heim C, Gong J, et al. Alliance, trust, and loss: experiences of patients cared for by students in a longitudinal integrated clerkship. *Academic Medicine*. 2019;94(11):1806–1813.
- Gaufberg et al., 2014 Gaufberg E, Hirsh D, Krupat E, et al. Into the future: patient- centeredness endures in longitudinal integrated clerkship graduates. *Medical Education*. 2014;48(6):572–582.
- [Greenhill et al., 2018](#) Greenhill J, Richards JN, Mahoney S, Campbell N, Walters L. Transformative learning in medical education: context matters, a South Australian longitudinal study. *Journal of Transformative Education*. 2018;16(1):58–75.
- Hirsh, 2014 Hirsh D. Longitudinal integrated clerkships: embracing the hidden curriculum, stemming ethical erosion, transforming medical education. In: Hafferty FW, O'Donnell J, eds. *The hidden curriculum in health professions education*. Hanover: Dartmouth College Press; 2014.
- Hirsh et al., 2012 Hirsh D, Gaufberg E, Ogur B, et al. Educational outcomes of the Harvard Medical School-Cambridge Integrated Clerkship: a way forward for medical education. *Academic Medicine*. 2012;87(5):1–8.
- [Hirsh et al., 2014](#) Hirsh DA, Holmboe ES, Ten Cate O. Time to trust: longitudinal integrated clerkships and entrustable professional activities. *Academic Medicine*. 2014;89(2):201–204.
- Hirsh et al., 2007 Hirsh D, Ogur B, Thibault G, Cox M. New models of clinical clerkships: “continuity” as an organizing principle for clinical education reform. *New England Journal of Medicine*. 2007;356(8):858–866.
- Hirsh and Worley, 2013 Hirsh D, Worley P. Better learning, better doctors, better community: how transforming clinical education can help repair society. *Medical Education*. 2013;47(9):942–949.
- [Hogenbirk et al., 2015](#) Hogenbirk J, Robinson D, Hill M, et al. The economic contribution of the Northern Ontario School of Medicine to communities participating in distributed medical education. *Canadian Journal of Rural Medicine*. 2015;20(1):25–32.

- Latessa et al., 2017 Latessa RA, Swendiman RA, Parlier AB, Galvin SL, Hirsh DA. Graduates' perceptions of learning affordances in longitudinal integrated clerkships: a dual-institution, mixed-methods study. *Academic Medicine*. 2017;92(9):1313–1319.
- O'Brien et al., 2016 O'Brien BC, Hirsh D, Krupat E, et al. Learners, performers, caregivers, and team players: descriptions of the ideal medical student in longitudinal integrated and block clerkships. *Medical Teacher*. 2016;38(3):297–305.
- Ogur and Hirsh, 2009 Ogur B, Hirsh D. Learning through longitudinal patient care - narratives from the Harvard Medical School - Cambridge Integrated Clerkship. *Academic Medicine*. 2009;84(7):844–850.
- Ogur et al., 2007 Ogur B, Hirsh D, Krupat E, Bor D. The Harvard medical school-Cambridge integrated clerkship: an innovative model of clinical education. *Academic Medicine*. 2007;82(4):397–404.
- Poncelet and Hirsh, 2016 Poncelet, A., Hirsh, D. (Eds.), (2016). *Longitudinal Integrated Clerkships: principles, outcomes, practical tools and future directions*. Syracuse, NY: Gegensatz Press.
- Poncelet et al., 2011 Poncelet AN, Bokser S, Calton B, et al. Development of a longitudinal integrated clerkship at an academic medical centre. *Medical Education, Online*. 2011;16:5939.
- Roberts et al., 2017 Roberts C, Daly M, Held F, Lyle D. Social learning in a longitudinal integrated clinical placement. *Advances in Health Sciences Education, Theory and Practice*. 2017;22(4):1011–1029.
- Snow et al., 2017 Snow SC, Gong J, Adams JE. Faculty experience and engagement in a longitudinal integrated clerkship. *Medical Teacher*. 2017;39(5):527–534.
- Somporn et al., 2018 Somporn P, Ash J, Walters L. Stakeholder views of rural community-based medical education: a narrative review of the international literature. *Medical Education* 2018.
- Verby et al., 1991 Verby JE, Newell JP, Andresen SA, Swentko W. Changing the medical school curriculum to improve access to primary care. *Journal of the American Medical Association*. 1991;266(1):110–113.
- Walters, 2014 Walters, L. (2014). Parallel consulting in community-based medical education. In A. B. Chater, J. Rourke, I. D. Couper, R. P. Strasser, & S. Reid (Eds.), *Wonca Rural Medical Education Guidebook World Organisation of Family Doctors: Wonca Working Party on Rural Practice*. Available from www.globalfamilydoctor.com. (Accessed 14

January 2017).

Walters et al., 2012 Walters L, Greenhill J, Richards J, et al. Outcomes of longitudinal integrated clinical placements for students, clinicians and society. *Medical Education*. 2012;46(11):1028–1041.

Walters et al., 2011 Walters L, Prideaux D, Worley P, Greenhill J. Demonstrating the value of longitudinal integrated placements for general practice preceptors. *Medical Education*. 2011;45(5):455–463.

Learning in a Simulated Environment

Roger Kneebone, Debra Nestel and Fernando Bello

Trends

- Simulation is a means, not an end.
- Simulation must be authentic, reflecting and resonating at some level with the realities of the clinical world.
- Simulation does not need to be complex or expensive to be effective.
- Simulation technology will continue to advance rapidly, opening up further opportunities for education and training.
- Simulation can integrate 'communication' (simulated patients, clinical teams) with 'procedural' skills (technology).

Key concepts

- Simulated participants (patients) (SP): individuals trained to portray individuals in scenarios and to provide feedback to learners about their experience ([Nestel & Bearman, 2015](#)). Most commonly, the participants are in the role of patients.
- Hybrid simulation: a combination of simulation modalities to enable holistic practice of clinical skills ([Kneebone et al., 2002](#)), such as an SP aligned with a task trainer for performing a procedural skill.
- Simulation as design: a conceptual framework for simulation as design involves selection, abstraction, re-presentation and intensification ([Kneebone, 2016](#)).
- Hybrid simulators: a combination of a physical model with customized software and electronics/mechatronics, offering a range of interactive settings that support learning.

Introduction

Decades of debate about whether or not simulation ‘works’ have changed into discussions about how to embed and implement it. An initial preoccupation with high technology and a focus on anaesthesia and interventional specialties has broadened to include simulation at every level of clinical education. The question is no longer if we should use simulation, but how.

Yet confusion remains, and learning through simulation is often perceived as a specialized domain requiring dedicated facilities and complex equipment. Simulation is often framed as an end in itself, detaching technical procedures from their clinical context and presenting them as something that can be practised in isolation. Terms such as ‘simulation centre’ make simulation itself the focus, rather than addressing what is to be simulated and why. This historical association with expensive static facilities and high technology can mask the widespread usefulness of simulation at much simpler levels.

Unhelpful distinctions between ‘technical’ and ‘nontechnical’ skills compartmentalize educational practice ([Murphy et al., 2019](#)). This chapter resists such notions of separation, arguing instead for an integration of approaches and resources and asserting that simulation—like lectures, bedside teaching or any other educational approach—is a means rather than an end. Running alongside clinical practice, simulation offers a parallel resource to support learners as their clinical experience grows and develops.

Simulation can have a powerful impact on participants and requires specific considerations to ensure that this impact is positive, constructive and ethical ([Park & Murphy, 2018](#)).



Tip

Like other educational methods, simulation can support students in preparing them to learn in and from clinical practice.

This chapter is for the general medical reader rather than the simulation specialist. It sets out to give an accessible account of current developments and focuses on medical education rather than speciality training. Simulation, we argue, can happen anywhere—not just in simulation centres. A challenge is for clinicians and educators to take back control and democratize simulation, whether or not they have access to costly specialized facilities. We therefore start by going back to basics, asking what are the clinical and educational challenges to which simulation can offer solutions.

Background

We define simulation as a process where principles of design are used to integrate clinical care with education. The central focus is what takes place between two people—a clinician and a patient, or a teacher and a learner—held together in a relationship of care. Knowledge and skill must be applied within a context of trust, integrity and professionalism, and simulation must reflect this human relationship.

The acquisition of expertise requires sustained deliberate practice with the intention to improve, underpinned by feedback and critique in a supportive environment conducive to learning. The ability to pause, restart and replay a clinical encounter provides invaluable opportunities to apply educational principles to the clinical setting. It is also important for learners to experience failure, and to recognize when they are approaching (or crossing) the limits of their competence. Such ideals often conflict with the constraints and dangers of the clinical setting.

Simulation offers a solution to some of these challenges, identifying aspects of clinical care (with all the dangers and complexities which that implies) and transplanting those to a setting where the educational needs of learners are treated as prime and where no real patient can suffer harm.



Tip

Simulation offers learners the opportunity to rehearse elements of clinical care in patient-safe environments and to receive feedback intended to develop future practice.

We therefore argue that simulation is not an end in itself, but rather a means to support learning. In recent years, the emphasis has moved from practising so-called ‘technical’ skills on isolated models to a more comprehensive vision which encompasses the complex human context of unique individuals working together. This needs to take into account what educational theory can tell us about how people learn, especially under conditions of pressure and stress.

Earlier discussions centred on practical issues, such as the provision of simulators or the detailed recreation of clinical settings. The debate now is how to embed simulation most appropriately within the world of clinical practice, ensuring a proper balance between technicist and humanist perspectives. We cannot think of patients as depersonalized bodies and procedures as tasks performed according to a formula. Each encounter with a patient or colleague is unique.

This chapter challenges the notion that simulation requires costly static facilities. Developments such as ‘in situ’ simulation blur the edges between clinical care and education, by taking simulation into clinical settings. Our own developments of hybrid, distributed and sequential simulation (described later) offer further possibilities. More recently still, simulation has been used as a means of sharing the closed practices of

healthcare with patients and those who care for them and with publics and society at large.

Simulation as design

Simulation can be thought of as a verb rather than a noun; an activity or method rather than a place or an array of physical simulators. Viewed as an activity, simulation is much more flexible than is commonly perceived and can be adapted, modified and shaped according to individual circumstances and needs. To do this, a conceptual framework is necessary. Framed as an active process, simulation involves the following elements ([Kneebone, 2016](#)):

- Selection from the complex world of what is to be examined, taught and learned. This requires dialogue between 'clinician,' 'educator' and 'patient' perspectives. For example, learning a bedside procedure (such as inserting a urinary catheter in a distressed elderly man with acute retention of urine following an operation) might be identified as a learning need.
- Abstraction of the selection, removing it from its original setting. This requires analysis of the key objectives in terms of clinician-patient interaction (including fine motor skills) and clinical learning. In the earlier example, inserting the catheter requires a combination of procedural skill (inserting the catheter accurately and safely) and interpersonal sensitivity (reassuring a distressed patient while working with a clinical colleague).
- Re-presentation of the abstracted selection. This provides the opportunity to carry out the task in question, performing the practical procedure on a model while engaging with the patient as a person. This may take place within a dedicated centre or in alternative venues, allowing selected aspects of clinical practice to be addressed within a safe yet realistic simulated setting. Such settings take the needs of clinicians, patients, learners and educators into account in designing apt environments for learning which balance challenge and support.
- Intensification is an outcome of this process. By stripping away what is inessential (such as distractions from other patients on a ward or other elements of real-world complexity), learners are freed up to focus on their individual learning needs at that moment.



Tip

A conceptual framework for designing simulations comprises selection, abstraction, re-presentation and intensification.

Simulated patients

This section outlines the pivotal role of simulated patients (SPs) in capturing the essence of clinical practice and implementing the 're-presentation' described earlier. At the core of healthcare practice is the communication between patients and healthcare professionals. [Kneebone \(2014\)](#) describes how this relationship of care is mediated by voice:



"[Voice]...is a complex concept that can be read in both literal and metaphorical terms. From this perspective, voice – extended to include facial expression, gesture, touch, even clinical interventions – is medicine's primary medium of connection. Making sense of voice involves the ability to transmit and receive simultaneously, continually modulating one in response to the other."

[Kneebone \(2014\)](#)

It is through this notion of voice that SPs make their contribution to medical and health professional education—as a proxy for real patients in this relationship of care.

Simulated patient methodology and trends in medical education

Since the 1960s there have been reports of SPs in medical and later in health professions education. The first documented accounts of SP work are attributed to [Barrows \(1993\)](#), a neurologist and innovative educator in the United States. Barrows experimented with teaching well people to demonstrate clinical signs to prepare medical students for clerkships. However, he was concerned with more than the clinical signs, coaching SPs to present the gestalt of the patient. Skilled clinicians were unable to detect that SPs were not 'real'. Although there was initial resistance by his peers, Barrows persisted and there is now a sophisticated global SP industry.

Fundamental concepts in simulated patient methodology

Although SPs are now described as well people trained to portray a patient in a healthcare scenario and to offer feedback to learners on how they were received or experienced ([Nestel & Bearman, 2015](#)), their range of practices varies tremendously. SP methodology refers to scholarship associated with SP-based practices for educational and/or research purposes. Here, the 'P' in 'SP' refers to patients, but it could quite easily refer to other participants, such as relatives, bystanders, healthcare professionals or others. We also use the term simulated rather than standardized (a common North American usage) to reflect our values about relationships of care and their portrayal by SPs.

An effective relationship is one in which the continual modulation of voice leads to respectful understanding. A tension in contemporary SP methodology is reconciling the standardization of SP portrayals required for Objective Structured Clinical Examinations (OSCEs) with the representation of the complexity of real clinician-patient relationships. Indeed, we value individual variation as a particular strength of SP methodology, capturing the uncertainties and unpredictabilities of clinical practice. This affords learners the opportunity to be immersed in SP-based scenarios, to reflect on what occurred and to share insights from SPs.

Discourses of clinical competence

International trends in medical education have influenced SP practices, especially the focus on medical competence and its shifting discourses as described by [Hodges \(2012\)](#). In SP methodology, the performance discourse is illustrated by providing the opportunity for learners to demonstrate their ability to perform a clinical skill with an SP (e.g., history taking, explaining a procedure). In the psychometric discourse of competence, all behaviours are considered to be measurable and as such translatable to numbers. Standardization and SP-based stations in OSCEs offer an obvious example. Standardization often reduces exchanges within the OSCE station to overly simplistic cues and responses that do not reflect real relationships but privilege specific clinical actions. This is a move away from Barrow's original concept. A more recent discourse of competence as reflection is represented by learners making meaning of clinical encounters through feedback from SPs. This feedback is intended to shape learners' future practices. A shift to a production discourse of competence focuses on quality outcomes illustrated by the Association of Standardized Patient Educators (ASPE) in developing standards for SP practices ([Lewis et al., 2017](#)). Each of these discourses of competence has varying degrees of presence in contemporary SP practices. It is important to reflect on these discourses as they influence the ways in which SPs approach their work. Finally, [Bearman and Nestel \(2015\)](#) note an emerging complexity discourse of SP methodology, a theme developed in this chapter.

Scope of simulated participants practice

SPs can contribute to a wide range of patient-based healthcare scenarios and be coached to describe symptoms and demonstrate signs, supporting the development of communication, professionalism and patient safety. SP-based scenarios enable learners to experience these core components of clinical practice in a patient-safe environment. Commonly, scenarios focus on exchanges between learners and SPs in clinical tasks, such as exploring patients' histories, negotiating management plans and sharing information. Specific clinical characteristics of illnesses and diseases can be portrayed, including acute and chronic conditions affecting any bodily system and age of patient.

Because SPs can look, sound and behave as real patients, they also contribute to the development of clinical reasoning, physical examination, investigative, procedural, operative and therapeutic skills through appropriate scenarios. Recent developments focus on interprofessional collaborative practice, placing SPs at the centre of team-based simulations. Although SPs usually work in simulated environments, they sometimes work in real clinical ('in situ') settings. An obvious advantage is the authenticity of the environment, reflecting the setting in which the learners are or will be expected to practice. A variation on in situ simulations is incognito or unannounced SPs, where the SP is functioning as a mystery shopper might in retail, but here the SP works in a clinical setting and makes judgements of learner performance and clinical processes in the workplace.

Hybrid simulations

The potential of SPs continues to expand, such as in mastering procedural skills. We have pioneered the concept of hybrid simulation, in which a simulator is placed beside an SP to enable procedural, operative and investigative skills to be practised and consolidated ([Kneebone & Nestel, 2010](#); [Kneebone et al., 2002](#)). For example, a suture pad strapped to the arm of an SP to enable a learner to practise wound closure, a simulator arm positioned on an SP for learners to practise establishing an intravenous line, a virtual reality simulator placed at the end of an examination couch with the SP lying on their side with legs drawn up for learners to practice flexible sigmoidoscopy. Drapes, other props, make-up and moulage products create an illusion of seamlessness between the simulator and the SP.

We developed this approach to support learners in the challenges of integrating the complex sets of skills required for safe and effective care. Hybrid simulations facilitate this integration, and are suited to most clinical events in which the patient is conscious. Many manufacturers now develop simulators to accommodate hybrid simulations.

Patients' voices

Although these are exciting advances, much SP-based work is framed from clinician perspectives and the needs of the curriculum rather than presenting authentic patients' voices. Scenarios are often seen as 'a mirror for the teachers' preconceptions rather than as an authentic reflection of a patient encounter' ([Nestel & Kneebone, 2010](#)). It is common for clinicians to determine learning goals, design scenarios and direct feedback that inadvertently overlook patients' perspectives and experiences. Even the way we have described the hybrid simulations earlier privileges clinical tasks over patients' experiences. SP methodology offers unique opportunities to access the complexity of clinical practice, to explore the relationship of care and to examine the voices of learners and SPs in a particular place and time.



Tip

Simulated patients are proxies for real patients; portraying and offering feedback from patients' (not clinicians') perspectives.

When empowered, SPs can make a unique contribution by speaking for patients rather than for clinicians. Strategies include patient participation in all stages of SP methodology, from establishing learning goals to evaluation, and in selection, abstraction, re-presentation and intensification. Co-construction of scenarios by clinicians, learners and patients may ensure that all perspectives are valued in the process of learning about relationships of care. Although it may be impracticable to do this every time, it must happen often enough to ensure that learners learn what patients value ([Nestel et al., 2018b](#)).

Another strategy is to base scenarios on real patients' histories, an approach which is usually 'filtered' through clinicians' perspectives ([Nestel et al., 2008](#)). Inviting real patients to work with SPs is a seemingly obvious, but underused strategy. Of course, there are limitations with this approach. These include the willingness, ability and suitability of real patients to participate (one important reason for involving SPs in the first place), the impact on a real patient of an actor portraying their experience (a potentially confronting experience) and the sharing of personal information (issues of confidentiality). Locating the teaching of clinical skills as part of a broader arc of patient care (including discharge planning, say, or other follow-up care) offers more patient-centred approaches to learning.

Qualities of simulated patients

A spectrum of SP practices ranges from simple to complex, and this expanded scope of practice requires high levels of expertise. The demands on the SP in a scenario are varied, but usually require the ability to remain in role while responding appropriately to cues offered by the learner. SPs need to be able to recall what they noticed about what the learner was offering, what they themselves transmitted in response and why—all key constituents of feedback. Added to this is the emotional load of role portrayal, of many repetitions of a scenario, of working with a facilitator, and offering what is often trenchant feedback to learners. The SP will be expected to report on more than the words and gestures exchanged, perhaps including the way in which the learner used the environment or artefacts in the setting—the placement of medical notes, the positioning of chairs, the handling of medical equipment and more. Specialist language may be required to get at the essence of the relationship of care.

The role of the SP is extremely complex. A dramatic arts background offers a solid foundation, especially in managing the emotional work of role portrayal, and a deep understanding of educational principles is also essential. Performance and educational experience are required for successful work at the complex end of the spectrum of SP practices.

Supporting simulated patients in role portrayal and feedback

Two main types of support for SPs are required; in portraying roles (re-presentation) and in offering feedback (intensification). For role portrayal, commencing with character development rather than the clinical event is one way of focusing attention on the patient as an individual (Nestel et al., 2015). SPs are encouraged to focus on embodying the person whom they will be portraying—of considering who that person is outside the clinical encounter. Only after this is achieved does the training shift to placing the person as a patient in a clinical context. Scenarios usually incorporate a written briefing document or SP role that guides preparation and rehearsal. There may be safety issues to be considered in teaching SPs to portray clinical signs and for working in hybrid simulations. Where SPs are being prepared for OSCEs, training needs to focus on establishing the parameters for appropriate responses.

There are many approaches to managing feedback for learners. It is beyond the scope of this chapter to outline these in detail. Here we consider verbal feedback immediately after a simulation. Facilitator-led feedback should have an invitational quality, which empowers SPs to share their experiences. Observers (e.g., other learners) may experience the scenario differently to the learner and the SP. Being a participant within the scenario offers a different experience to looking in from the outside. Acknowledging and respecting this difference privileges the relationship of care.

SPs usually step out of role to offer feedback. They speak from their experience within the scenario drawing on their in-the-moment decisions. Learner and SP relationships offer a different dynamic to that which learners have with real patients. Although learners often report forgetting that they are in a simulation soon after it commences, the fact remains that it is a simulation. The power balance can shift in either direction, and in part depends on the commitment of all participants in the scenario to use the experience as a learning opportunity.

Simply providing the opportunity for learners to practise skills in scenarios is insufficient. Feedback (e.g., spoken, audiovisual, rating forms) from multiple perspectives (e.g., clinicians, peers and SPs), together with reflection by which the learner makes meaning for future practice is critical. This is the forum for the voices described earlier to be explored. It is important to share scholarly research on what comprises patient-centred care and associated clinician behaviours. However, SPs must be encouraged to make meaning of this research relative to their own experiences, the roles they portray and the settings in which they work.



Tip

By using the conceptual framework described earlier, SPs can contribute to all phases

of simulation design and make truly patient-originating offerings to learners.

A key feature of simulation is that scenarios may be paused and the evolving clinician-patient relationship discussed. The learner can reflect on their progress with the SP and identify suggestions for development—a continual modulation of the participants’ voices. When the scenario is resumed, new ideas can be tested out. Time can also be compressed or expanded to enable access to particular elements of the relationship (see Sequential simulation later).

Simulation technology

The discussion now moves to the other key element in simulation—technology. Simulation technology has benefitted from advances in materials science, virtual and augmented reality (VR/AR) computing, mobile devices, advanced human-computer interfaces and three-dimensional (3D) printing. Although there is no doubt that it can play an important facilitating role in the simulation as design process described earlier, there is also a real danger of technology dominating the simulation discourse, particularly with the current wave of fashionable technologies: artificial intelligence (AI), VR, AR, mixed reality (XR), and so on. It is therefore crucial to acknowledge that the educational value of simulation technology lies not on how technically advanced or sophisticated it is, but on how well it can support the learning outcomes of a particular educational encounter. Thus clear vision, an educationally sound approach and an understanding of the affordances and limitations of a specific simulation technology are essential to make use of its potential, ensure a balanced partnership between pedagogy and technology, and avoid the simulation agenda being driven by the naturally vested interests of simulator and simulation technology companies.

A key use of simulation technology is to enable the re-presentation of the abstracted selection in the simulation as design process (see earlier), through the development of simulators, defined here as apparatus designed for rehearsing selected aspects of clinical practice. We recognize three main types of simulators: physical models, immersive simulators and hybrid simulators.



Tip

Simulation technology benefits from rapid advances in many other areas, but its true value depends on how well it can support the intended learning outcomes.

Physical models

Physical or bench-top models are widely used at undergraduate and early postgraduate levels of training ([Badash et al., 2016](#)). Also known as task trainers, they tend to focus on specific skills, examinations or procedures, allowing novices to practise them repeatedly. Made from a variety of plastic, silicon and other materials, they aim to resemble the look and feel of real life tissues and organs, offering direct handling of instruments and interaction with real materials. Clinical procedures simulated include venepuncture, cannulation, urinary catheterization, basic suturing, bowel and vascular anastomosis, hernia repair, as well as other commonly performed surgical tasks and physical examinations.

Recent advances in materials science, 3D printing and cross-fertilization between model makers, artists and medical educators have resulted in extremely realistic, visually and tactile, as well as functionally complex bespoke benchtop models. Physical models are relatively cheap in comparison to the other type of simulators. However, major drawbacks include fixed anatomy, wear and tear and lack of facilities for formative and summative assessment. The majority of these models also tend to be used in isolation separate from their clinical context, which can lead to a reductionist approach to learning.

Immersive simulators

The last 20 years have seen VR technology used to recreate a wide range of surgical procedures with an increasing level of realism, allowing learners to interact with a high-fidelity computer-based simulator ([Olasky et al., 2015](#)). Minimal access interventions are particularly suited as manipulating objects at a distance with suitable instruments, while watching a two-dimensional (2D) screen, already reflects standard practice in minimal access surgery. Such simulators consist of a suitable human-computer interface resembling the instruments used, a screen to display the virtual environment, and a computer to run the simulation. Learners may choose procedures with varying levels of difficulty; performance metrics (e.g., time taken, economy of movement, errors made) and the procedure itself can be recorded automatically. Feedback based on these metrics is normally provided after the procedure, with or without a tutor's input.

Several generations of VR simulators have been developed. In the late 1990s, the first generation focused on training basic skills by performing isolated tasks (e.g., pick and place, navigation) using abstract scenes and 2D representations of geometric solids (e.g., MIST-VR). The early 2000s witnessed the second generation focusing also on basic skills, but attempted to achieve this by using more realistic procedural tasks (e.g., LapSim). In the mid 2000s, the third generation allowed entire procedures to be simulated, introducing a degree of anatomic variability to create a range of difficulty levels, moving beyond psychomotor skill and beginning to include decision making (e.g., LapMentor). The current fourth generation reflects progress in computer graphics, design, interfacing and visualization, as well as enhanced ergonomics, improved content and curriculum management, and better integration with simulated clinical settings (e.g., VIST-LAB). One of its aims is to offer patient-specific simulation that allows specialists to plan and rehearse challenging cases before an actual operation. Although minimal access interventions continue to dominate, the range of surgical and nonsurgical specialties supported has increased significantly (e.g., dentistry, endoscopy, orthopaedics, neurology, urology, gynaecology, ophthalmology). Integration of fully immersive VR, AR and XR is also being explored by various medical and surgical simulation companies (e.g., LapMentor VR).

Cost and the need for ongoing specialized support is one of the major drawbacks of immersive simulators. Their design and development demand considerable resources, whilst their wider adoption requires tackling a range of practical, administrative, educational and financial challenges ([Olasky et al., 2015](#)).

Hybrid simulators

In this section, we draw a terminologic distinction (based on usage in the literature) between hybrid simulators and the broader concept of hybrid simulation (outlined earlier). Hybrid simulators are a combination of a physical model with customized software and electronics/mechatronics, offering a range of interactive settings that support learning. They lend themselves well to supporting hybrid simulation through their use with SPs and have the potential for also supporting team training, moving beyond practicing isolated technical skills and recreating the context of clinical practice.

Hybrid simulators include full body mannikins able to provide tactile, auditory, and visual stimuli (e.g., Laerdal SimMan, CAE METIman). Such simulators present a range of pathophysiologic variables and can respond to the administration of drugs, as well as give immediate feedback to a range of interventions. Mannikins are routinely used for anaesthetic training and are becoming increasingly common in other domains. They may be used within a dedicated educational facility, but also in the field. Full-body simulation allows for basic procedural practice, as well as forming part of immersive scenarios where learners can perform and reflect on critical diagnostic, management, communication, organizational and multitasking skills.

Hybrid simulators also cover endoscopy, endovascular and urologic interventions (e.g., EndoVR, EndoSIM, VIST-C, URO MENTOR), combining an authentic interface (endoscope, catheters/guidewires, cystoscope) with a realistic VR display. Such simulators are able to mimic a range of diagnostic and therapeutic interventions, at different levels of difficulty, allowing learners to gain the basics of manipulative skill through repeated practice. Decision-making is enhanced by the display of vital signs, haemodynamic wave tracings, and patient responses that appropriately reflect relevant physiology. Performance metrics are captured and presented after each procedure. A range of pathologic conditions and technical challenge levels is also offered.

As technology continues to advance, hybrid simulators and immersive simulators are converging, offering a wider range of functionality, larger selection of procedures, more sophisticated interfacing, photorealistic graphics rendering, and a more holistic integration within clinical scenarios.



Tip

Simulators range from simple benchtop models to highly complex full body mannikins and highly immersive systems.

Current and future trends

Simulation-related technology has continued to advance rapidly. Further increases in computational power are accompanied by substantial progress in graphics processing, optics, sensor technology, touch enabled human-computer interfaces, mobile technology and materials science. Unified software development platforms that facilitate rapid prototyping and beta testing, as well as reutilization of software components, are emerging. All of these, coupled with the wide availability and cost effectiveness of 3D printing, progress in the fields of medical imaging, instrumentation, diagnosis and intervention, are resulting in a new paradigm where simulation technology can support training and practice across all stages of healthcare in a coherent and coordinated manner. Consultation, specialist diagnosis, preoperative planning, intraoperative guidance, postoperative recovery, discharge, reintegration into and care in the community can all now be taken into account. AI and data analytics are beginning to make inroads into simulation. Their use is being explored to support the underlying computer modelling, provide intelligent tutoring assistants which offer personalized and adaptive training opportunities, and generate sophisticated learning analytics.

Further improvements in the realism, functionality and available variability of physical models can be expected, with smart bench-top models incorporating sensor and actuating technologies to provide real-time feedback, reproduce physiologic behaviour, and support more complex interactions. Integration between physical models and advanced software simulations will continue, blurring the boundaries between simulator types. At the same time, software development will converge towards more powerful, unified development platforms borrowed from the gaming industry. This will set the scene for a more cost-effective VR simulation development model based around a 'Simulation App Store', where simulation users download simulator Apps that can then be tailored and executed on a common smart simulation platform, which in turn will result in more flexible and affordable simulators.



Tip

Further advances in simulation technology are expected to make simulation more affordable, more widely available and more adaptable

Simulation in the 21st century

The earlier discussions have outlined two distinct approaches to simulation—the humanist and the technician. Historically, these have evolved along separate lines. We argue that much can be gained by aligning these traditions. In addition to our work on the concept of hybrid simulation described earlier, the following examples highlight such possibilities.

Distributed simulation creates ‘realistic enough’ clinical environments that are portable and relatively low cost ([Kassab et al., 2011](#); [Kneebone et al., 2010](#)). Physical contexts of care are provided by lightweight backdrops, often presented within an inflatable enclosure to delineate a consulting room, ward, operating theatre or intensive care unit. A sense of authenticity is created by clinicians working together to enact pathways of care which they carry out in real life, using actual clinical equipment to treat the ‘patient’ (represented by SPs, physical models or hybrid simulation). This ‘minimal necessary complexity’ allows the most appropriate level of detail for the purpose at hand to be selected, adjusting this as appropriate for selected participants.

Sequential simulation moves beyond single episodes to portray sequences of care, highlighting connections between elements in a clinical pathway ([Powell et al., 2016](#); [Weldon et al., 2015](#)). By concatenating a series of ‘scenes’ (for example a patient at home, in their community physician’s consulting room, in an ambulance, a hospital ward, operating theatre or intensive care unit), a clinical trajectory of days or weeks can be condensed into half an hour or less. In addition to addressing skills within a given section of the healthcare system, this allows transitions between phases of care to be rehearsed and examined ([Weil et al., 2018](#); [Weldon et al., 2017, 2018](#)). It also allows simulation to be taken into public spaces and other unorthodox venues to address societal issues, such as the rising incidence of knife violence among young people ([Tribe et al., 2018](#)).

The combination of distributed and sequential simulation opens opportunities for clinicians to engage with patients, their carers and the general public. By inviting nonclinicians to watch, take part in and interrogate pathways of care through simulation, healthcare professionals can widen their perspectives and gain valuable insights ([Tang et al., 2013](#)). By framing professionals, patients and publics as equally although different expert, simulation-based encounters can rebalance those inequalities in power which sometimes characterize clinical interactions, leading to ‘reciprocal illumination’ for all participants ([Kneebone, 2015](#)).

Integrated procedural performance instrument (IPPI) overcomes some of the limitations of OSCE-style assessment (such as an unduly formulaic approach based on learning prescribed procedures) by incorporating unpredictability within clinical scenarios ([Kneebone et al., 2006](#)). A series of stations integrates the humanist and technician challenges outlined earlier (such as siting an intravenous line in a patient with visual disability, or giving an injection to an angry and abusive patient). Structured feedback from SPs and clinician observers acts as an aid to self-critique and reflection by learners.

'Minimally expensive simulation' offers an alternative approach to simulation design. By inviting clinicians and students to work with what lies to hand rather than relying on costly specialized equipment, participants' imaginative powers and improvisational skills are brought to the fore ([Harris & Rethans, 2018](#)). This approach frames simulation as a creative process where teaching, learning and simulation design evolve in synchrony, countering an unhelpful tendency to separate the creation and manufacture of simulation from its educational application.

Summary

Simulation is central within contemporary clinical education and its role is set to expand. Yet simulation is often equated with costly, high-tech facilities dominated by a profitable industry. This chapter challenges assumptions about the need for cost, complexity and specialist expertise. In many cases, simulation is an activity which can be carried out anywhere, using what lies to hand, and does not depend upon elaborate or expensive facilities.

Of course, in many cases, sophisticated facilities remain essential. Simulation and its technologies have a crucial role in allowing procedural skills to be practised and assessed. As science and clinical care become ever more sophisticated, the need for specialized techniques to be practised in safety becomes increasingly evident. It is essential that emerging clinical techniques are accompanied by the means of learning to perform them safely and well. Technologic advances offer huge potential, especially in addressing the learning of ‘unsighted’ procedures mediated by touch, such as rectal or vaginal examination. Rapid advances in haptic simulation, AR and machine learning hold the promise of new approaches to multisensory learning.

Yet an emphasis on high technology for a specialized few can hide the benefits of simulation for the many. This chapter argues that much may be achieved by simple means; by using existing resources imaginatively, by thinking laterally and by resisting pressures from the commercial world to equate value with cost ([Nestel et al., 2018a](#)). The role of SPs in creating the human framework of care is crucial, whereas insights from experts outside medicine can enrich the ecosystem of simulation. Surprisingly much may be achieved with surprisingly little.

By framing simulation as an educational approach rather than a fixed product (a means of learning, not an end in itself) we can harness the creativity of patients, clinicians and all those who teach and learn. By doing so we can ensure that the relationship of care—in education as much as in clinical practice—remains at the centre of everything we do.

References

- [Badash et al., 2016](#) Badash I, Burt K, Solorzano CA, Carey JN. Innovations in surgery simulation: a review of past, current and future techniques. *Annals of Translational Medicine*. 2016;4:453.
- [Barrows, 1993](#) Barrows HS. An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Academic Medicine: Journal of the Association of American Medical Colleges*. 1993;68:443–451 discussion 451–453.
- [Bearman and Nestel, 2015](#) Bearman M, Nestel D. The future of simulated patient methodology. In: Nestel D, Bearman M, eds. *Simulated patient methodology: theory, evidence and practice*. West Sussex: Wiley Blackwell; 2015.
- [Harris and Rethans, 2018](#) Harris A, Rethans JJ. Expressive instructions: ethnographic insights into the creativity and improvisation entailed in teaching physical skills to medical students. *Perspectives on Medical Education*. 2018;7:232–238.
- [Hodges, 2012](#) Hodges B. The shifting discourses of simulation. In: Hodges B, Lingard L, eds. *The question of competence: reconsidering medical education in the twenty-first century*. New York: Cornell University Press; 2012.
- [Kassab et al., 2011](#) Kassab E, Tun J, Arora S, et al. “Blowing up the barriers” in surgical training: exploring and validating the concept of distributed simulation. *Annals of Surgery*. 2011;254:1059–1065.
- Kneebone, 2014 Kneebone R. Escaping Babel: the surgical voice. *Lancet*. 2014;384:1179–1180.
- [Kneebone, 2015](#) Kneebone R. When I say .. reciprocal illumination. *Medical Education*. 2015;49:861–862.
- Kneebone, 2016 Kneebone RL. Simulation reframed. *Advances in Simulation (Lond)*. 2016;1:27.
- [Kneebone et al., 2010](#) Kneebone R, Arora S, King D, et al. Distributed simulation – Accessible immersive training. *Medical Teacher*. 2010;32:65–70.
- Kneebone et al., 2002 Kneebone R, Kidd J, Nestel D, Asvall S, Paraskeva P, Darzi A. An innovative model for teaching and learning clinical procedures. *Medical Education*. 2002;36:628–634.
- [Kneebone and Nestel, 2010](#) Kneebone R, Nestel D. Learning and teaching clinical procedures. In: Dornan SE, ed. *Medical education: theory and*

practice. Elsevier 2010.

[Kneebone et al., 2006](#) Kneebone R, Nestel D, Yadollahi F, et al. Assessing procedural skills in context: exploring the feasibility of an integrated procedural performance instrument (IPPI). *Medical Education*. 2006;40:1105–1114.

[Lewis et al., 2017](#) Lewis K, Bohnert C, Gammon W, et al. The Association of Standardized Patient Educators (ASPE) Standards of Best Practice (SOBP). *Advances in Simulation*. 2017;2.

[Murphy et al., 2019](#) Murphy P, Nestel D, Gormley G. Words matter: towards a new lexicon for ‘nontechnical skills’ training. *Advances in Simulation*. 2019;4.

Nestel and Bearman, 2015 Nestel D, Bearman M. Introduction to simulated patient methodology. In: Nestel D, Bearman M, eds. *Simulated patient methodology: theory, evidence and practice*. West Sussex: Wiley Blackwell; 2015.

[Nestel et al., 2018a](#) Nestel D, Brazil V, Hay M. You can't put a value on that... Or can you? Economic evaluation in simulation-based medical education. *Medical Education*. 2018a;52:139–147.

[Nestel et al., 2008](#) Nestel D, Cecchini M, Calandrini M, et al. Real patient involvement in role development evaluating patient focused resources for clinical procedural skills. *Medical Teacher*. 2008;30:795–801.

[Nestel et al., 2015](#) Nestel D, Fleishman C, Bearman M. Preparation: developing scenarios and training for role portrayal. In: Nestel D, Bearman M, eds. *Simulated patient methodology: theory, evidence and practice*. West Sussex: Wiley Blackwell; 2015.

[Nestel and Kneebone, 2010](#) Nestel D, Kneebone R. Authentic patient perspectives in simulations for procedural and surgical skills. *Academic Medicine*. 2010;85:889–893.

[Nestel et al., 2018b](#) Nestel D, McNaughton N, Smith C, Schlegel C, Tierney T. Values and value in simulated participant methodology: a global perspective on contemporary practice. *Medical Teacher*. 2018b;40:697–702.

Olasky et al., 2015 Olasky J, Sankaranarayanan G, Seymour NE, et al. Identifying opportunities for virtual reality simulation in surgical education: a review of the proceedings from the Innovation, Design, and Emerging Alliances in Surgery (IDEAS) Conference: VR Surgery. *Surgery Innovations*. 2015;22:514–521.

[Park and Murphy, 2018](#) Park, C., Murphy, T., Code of Ethics Working

- Group 2018. Healthcare Simulationist Code of Ethics.
- [Powell et al., 2016](#) Powell P, Sorefan Z, Hamilton S, Kneebone R, Bello F. Exploring the potential of sequential simulation. *The Clinical Teacher*. 2016;13:112–118.
- [Tang et al., 2013](#) Tang J, Maroothynaden J, Bello F, Kneebone R. Public engagement through shared immersion: participating in the processes of research. *Science Communication*. 2013;35:654–666.
- [Tribe et al., 2018](#) Tribe HC, Harris A, Kneebone R. Life on a knife edge: using simulation to engage young people in issues surrounding knife crime. *Advances in Simulation (Lond)*. 2018;3:20.
- [Weil et al., 2018](#) Weil A, Weldon SM, Kronfli M, et al. A new approach to multi-professional end of life care training using a sequential simulation (SqS Simulation) design: A mixed methods study. *Nurse Education Today*. 2018;71:26–33.
- [Weldon et al., 2017](#) Weldon SM, Kelay T, Ako E, Cox B, Bello F, Kneebone R. Sequential simulation (SqS) utilised as a novel educational tool aimed at healthcare managers: a patient-centered approach. *British Medical Journal of Simulation and Technology Enhanced Learning*. 2017;4:13–18.
- [Weldon et al., 2018](#) Weldon SM, Kelay T, Ako E, Cox B, Bello F, Kneebone R. Sequential simulation used as a novel educational tool aimed at healthcare managers: a patient-centred approach. *British Medical Journal of Simulation and Technology Enhanced Learning*. 2018;4:13–18.
- [Weldon et al., 2015](#) Weldon SM, Ralhan S, Paice E, Kneebone R, Bello F. Sequential simulation (SqS): an innovative approach to educating GP receptionists about integrated care via a patient journey--a mixed methods approach. *BMC Family Practice*. 2015;16:109.

Independent Learning and Distance Education

John Sandars and Kieran Walsh

Trends

- Independent learning is essential for postgraduate medical education and continuing professional development, with learners taking responsibility to effectively meet their learning needs that are identified from daily professional practice.
- Independent learning is developmental and requires the development of self-regulated learning attributes through teacher guided active learning opportunities during basic medical education and postgraduate medical education, such as problem-based learning and flipped classrooms.
- Technology provides increasing opportunities for distance learning, with access and creation of a wide variety of learning resources outside the traditional classroom.
- Evaluation of learning resources and digital literacies are essential for independent learning and distance education. This is a challenge for both teachers and learners.

Key concepts

- Independent learning: a learning process with a shift in the control and responsibility of learning from the teacher to the learner.
- Distance learning: learning which occurs away from the confines of the traditional classroom, enabled especially by the use of technology.
- Self-directed learning: a learning process in which the learner takes full control and responsibility for their own learning.
- Self-regulated learning: a cyclical learning process to plan, self-monitor and dynamically adapt motivation and learning strategies to ensure effective learning.
- Ubiquitous learning: learning occurs at any time and in any location, and is enabled by ubiquitous technology, which is available on any device, at any time, in any location, and in any format.

Introduction

All learning has an outcome, such as the acquisition of new knowledge, skill or perspective, but an important consideration for all medical teachers is the process by which the outcomes are achieved. The process can be highly dependent on the teacher, with the teacher having control over both the outcome and the process. For example, the content of a lecture may be entirely determined by the teacher with no opportunity for the learner to be actively involved during the lecture. In contrast, the process can be highly dependent on the learner, with the learner taking full control over their learning, making decisions about the content and how this content will be acquired. Between these two extremes, the extent to which the teacher and learner determine the content and process of learning can vary. For example, the teacher may facilitate the learning by providing directions to content that is expected to be accessed before a lecture or small group session (however the learner will also be free to explore other content related to their own learning needs).

There is a wide variety of medical education content that can be easily accessed by learners, and increasingly, this content is both accessed and provided using technology. For example, smartphones can provide rapid ‘one click’ access to a range of learning resources—from mobile device applications (apps) to social media (such as Twitter and YouTube) to websites. This content also has a spectrum of teacher and learner control in its creation. For example, social media may be entirely learner created but websites, such as online learning modules, are often developed by teachers and replicate lectures. The ubiquitous nature of technology has led to a revolution in distance learning, which occurs away from the confines of the traditional classroom, to become increasingly integrated with a range of teaching and learning approaches. For example, a small group teaching session with specific online content on a website provided by a teacher can be integrated with collaborative learning through social media interactions between learners before, during and after the session.

In this chapter, we will discuss the terms that describe learning across the range of learner control, the importance of learners taking control of their own learning, the main characteristics of learners who take control of their learning, and how to develop learners so that they can take control, including the use of technology to enable distance learning. The main principles span the continuum of medical education.

The terms that describe learner control of learning



"The term 'independent learning' describes a shift in the control of and responsibility for learning from the teacher to the learner."

Higher Education Academy (2019)

The World Federation for Medical Education, which informs national policies on basic medical education, postgraduate medical education and continuing professional development, uses the same term to describe this essential aspect of medical education and highlights the importance of progressively increasing learner control over the continuum of medical education ([World Federation for Medical Education: London, 2015](#)).

Independent learning is a key feature in the literature on childhood education but the important role of the teacher in guiding the learner towards meeting specified learning outcomes is emphasized because it is considered that children have not fully developed their capacity to be independent learners ([Meyer et al., 2008](#)). The importance of the teacher for independent learning is also recognized in the Association of American Medical Colleges (AAMC) Curriculum Inventory, with teacher guided learning outside formal medical education settings, such as classrooms, but it also refers to independent study and preparation for formal learning activities, such as problem-based learning or team-based learning sessions ([AAMC, 2016](#)).

The literature on adult education has a focus on 'self-directed learning', with the learner taking full control and responsibility for their own learning ([Brockett & Hiemstra, 2018](#)). The AAMC Curriculum Inventory similarly recognizes the importance of self-directed learning for lifelong learning but considers it to be distinct to their definition of independent learning, with its greater guidance for the learner ([AAMC, 2016](#)).

Although there are differences in the use of the term independent learning and self-directed learning in medical education, we will use independent learning throughout this chapter to describe a broad process in which the learner takes control and responsibility for their learning, especially because the key skills required by learners are identical. An important aspect of basic medical education and postgraduate medical education is the development of learners so that they become increasingly responsible for their own learning, which is essential for continuing professional development.

Importance of being an independent learner

The ultimate aim of medical education is to ensure high quality and safe care for patients. This requires doctors to take individual responsibility for not only the care of their patients but also their own learning to ensure that knowledge, skills and professional attitudes are constantly updated in response to the needs of patients. The adoption of this independent approach to learning is essential for continuing professional development.



"Research has shown that doctors respond to the wide range of problems, from clinical to ethical and legal to administrative, that they face in daily professional practice by identifying their own specific learning needs."

Slotnick (2001)

These learning needs become specific learning goals and these are met by a variety of learning resources. The new learning is then directly applied to current and future practice. Increasingly, responding to specific learning goals is by just-in time learning, and this is enabled by ubiquitous technology, which is available on any device, at any time and at any location.

Independent learners have increased intrinsic motivation, with learning driven by internal reward, and become more actively engaged in the process of learning. This has important implications for the provision of basic and postgraduate medical education, especially because developing high intrinsic motivation is essential for lifelong learning.

Characteristics of independent learners

There are two essential characteristics of being an independent learner. The first is the identification of the need to learn and the second is effectively meeting this need.

Identification of the need to learn

During the performance of any academic or clinical activity, the independent learner may become aware of a feeling of uncertainty or surprise when there is a difference between the intended outcome of their performance and the actual outcome. Internal feedback on performance through self-monitoring and awareness of the level of performance can be difficult for many learners, especially low performers who tend to overestimate their level of performance. However, research has consistently shown that external feedback provides an important stimulus for learning ([Hattie & Clarke, 2018](#)). Feedback can be obtained from a wide range of sources, from patient comments to formal assessments, and an independent learner is highly motivated to both seek and respond to feedback. This motivation is intrinsic and has internal rewards, such as increased satisfaction by performing to the best of their ability. This is in contrast to dependent learners who seek external rewards, such as approval from others.

Effectively meeting the learning need

The process of effectively meeting the identified learning need requires the learner to have high abilities in self-regulated learning ([Schunk & Greene, 2017](#)). Self-regulated learning can be described in three phases:

Phase 1

It is important for the learner to set clear and specific learning goals to meet their learning needs, such as information seeking from a particular resource or developing a skill.



Tip

Research in both academic and clinical contexts has consistently shown that setting learning goals is essential for effective learning.

Goal setting not only directs the learner to a specific learning activity but also motivates the learner to actively engage in the learning activity to ensure that the goal will be achieved. Effective learners choose the most appropriate learning strategies from a range of different strategies, such as note taking to maximize information retention or

searching the internet for relevant information.

Phase 2

While pursuing the learning goal, it is essential for the learner to maintain their motivation and to constantly self-monitor the extent to which their chosen goals and strategies are meeting their intended learning outcomes. Effective learning requires making modification to motivation, goals and strategies through a constant 'fine tuning' process.

Phase 3

Effective learners reflect by using both internal and external sources of feedback on how they have attempted to meet the identified learning need during Phase 1 and 2 so that they can be more effective when they approach learning in the future. An important aspect of effective learners is that their attribution beliefs about success and failure to achieve their intended outcomes have a focus on factors that are controllable by the learner, such as their approach to learning, instead of factors that are uncontrollable by the learner, such as chance or the intelligence of the learner. This has implications for future motivation of the learner because uncontrollable beliefs lower motivation.

Although the main focus on self-regulation has been on the individual learner, there is increasing interest in the importance of the influence of other learners and the context on the extent to which the individual learner is a self-regulated learner and an independent learner. Individuals are rarely isolated in their academic or clinical practice and frequently they are members of a group or team. These situations create opportunities for individual learners to seek external feedback during all of the phases of self-regulated learning. The context is also a major influence, especially by means of institutional and curriculum approaches to education.

The challenge of developing independent learners

Research suggests that the development of self-regulated learning and independent learning for an individual learner is progressive across the basic medical and postgraduate medical education phases of medical education. There is an essential role for the teacher in this developmental process, acting as a facilitator to guide the learner in both how to self-regulate their learning and how to find appropriate learning resources. The involvement of the teacher should progressively diminish as the learner becomes more independent.

Important approaches for facilitating development include

Providing opportunities for specific advice and support on developing the key attributes required for self-regulated learning and independent learning

The initial development of self-regulated learning is often provided through study skills sessions, with a focus on goal setting and seeking feedback, but an essential time for increased provision is during remediation for underperformance, both academic and clinical. It is essential for teachers to remember that all interactions with learners should have the aim of developing self-regulated learning and independent learning. There is a temptation to take control when the learner appears to be struggling and, instead of providing information, the focus should be on how to find the required information.

Promoting the development of self-regulated learning and independent learning through the delivery of the curriculum



Tip

The curriculum has a major influence on the development self-regulated learning and independent learning, especially the approach to teaching and assessment.

There is increasing use of more active approaches to learning; from problem-based learning to team-based learning to flipped classrooms. These approaches require learners to meet their learning goals through a variety of learning resources, and many of these will be internet based. However, an important challenge in basic medical and postgraduate medical education is the frequent high stakes assessments that have a major focus on the acquisition and demonstration of specific competences. There is a tendency for learners to only prepare for an assessment and teachers are frequently requested by learners to provide teaching with only this focus.

Developing essential skills for evaluating learning resources

An important responsibility of teachers is their evaluation of learning resources regarding their suitability to the learning needs of learners. With independent learning, this responsibility is transferred to the learner and developing the essential skills for

evaluating learning resources is a key factor in the selection of appropriate resources, especially when there are a vast number of resources from which a choice has to be made. All learning resources should be evaluated to ensure that the content is up to date, there are details of the author to ensure that the content can be trusted and is without bias, the content is justified, such as links to a journal article or expert opinion, and the source should be verified, because many resources have commercial sponsorship and the main purpose might be selling a product.

The digital world and distance learning by the independent learner



Tip

There are a very wide range of opportunities for distance learning by the independent learner, which occurs away from the confines of the traditional classroom or lecture hall, using the enormous variety of learning resources that are enabled by technology in the digital world.

Most learners have a smartphone that can easily access a vast source of content that is widely dispersed across numerous learning resources. Increasingly, learning is just-in-time and occurs as a response to learning needs that are identified through educational experiences, such as small group sessions, or through interactions with patients. This ubiquitous learning, at any time and in any location, is enabled by ubiquitous technology, using any device, in any location and in any format. Learning with technology rapidly moves the control of learning from the teacher to the learner, especially the pace of learning, but often the teacher will continue to create content, such as apps or websites. In ideal circumstances, online learning resources will enable learners to put their self-regulated learning skills into action for the purpose of more effective and more efficient learning.

Apps

This technology is designed to be run on a mobile device (including smartphone) and many can also connect to websites that offer a wider range of content. The variety of content in apps is huge, from interactive educational games to clinical decision support tools to interactive resources, such as anatomy and clinical skills revision aids.

Social media

This term includes blogs and microblogs (such as Twitter), internet forums (many of which are hosted by professional organizations), content communities (such as YouTube and Instagram) and social networking sites (such as Facebook and LinkedIn). Most of these social media resources have content that is created by learners and an important aspect of social media is collaborative learning, with sharing information and opinion, but also learners have the opportunity to validate their current knowledge against their peers.

Most learners who use social media will regularly follow the content that has been posted to a particular social media site. These resources provide useful up-to-date links

to current new information and opinion across a broad range of topics. The content is often provided by an 'influencer' who has expertise within the topic and is followed by many learners, often in their thousands. Finding and following social media can be greatly helped by sites that identify current trends, such as the Symplur Healthcare Hashtag Project, and by using aggregators, such as Feedly.

Free open-access medical (FOAM) education has become increasingly adopted in postgraduate medicine and continuing professional development in emergency medicine, anaesthetics and paediatrics. Each discipline offers a range of separate sites and the FOAM education sites contain a range of content, including blogs, podcasts, online videos, photographs, text documents and online quizzes.

Websites

The internet can provide a vast learning resource of over 2 billion websites, with content which can be potentially created by anyone with internet access, and can be accessed by a variety of search engines. The vastness of this potential learning resource, and its variable quality of information, requires learners to have well-developed self-regulated learning attributes to ensure that independent learning goals are met but also skills to evaluate learning resources are essential. It is essential that the learner does not drown in a sea of learning resources.

Some websites have been created by teachers and online clinical decision support tools are increasingly being used in postgraduate medical education and continuing professional development. This resource enables learners to formulate a clinical question, find an answer to that question, and put their new learning into practice for the benefit of their patients. An ideal clinical decision support resource will enable learners to find an answer that is evidence based and continually updated but is also highly practical. Clinical decision support resources enable learners to mainly access knowledge online but other forms of online learning resources can enable learners to achieve other learning outcomes, including skills and behaviours. These online resources usually have a multimedia approach, including video and text-based materials, and can support learning of communication and procedural skills. They can also enable behaviours associated with effective team working or quality improvement. Online resources are frequently based around clinical cases, with real life clinical scenarios to help learners think through how they will put their learning into action in the real world. Many such resources also have an assessment at the end to enable learners to self-assess that their learning goals have been effectively met.

Learners increasingly expect to be able to keep a record of their online learning, including their internet searches, especially for sharing with their supervisor or appraiser, or claiming continuous professional development credits as a result of their learning. However, many regulators of continuing professional development operate a system that captures learning in a time-based manner, where learners claim credits on the basis of the number of hours that they spend learning. However, newer systems will be required that recognize how technology is transforming learning, with capture of their online activity.

Digital literacies for independent learning and distance learning



"There are numerous definitions of digital literacies but all have a focus on the learner having specific abilities to enable them to take maximum advantage of learning with the wide range of potential learning resources in the digital world."

Health Education England, London (2018)

The main literacies include:

- Technology literacy: the ability to proficiently use a range of different technologies, from devices to applications to networks.
- Information literacy: the ability to effectively retrieve, interpret, evaluate and curate the vast amount of information available across multiple sources.
- Media literacy: the ability to effectively produce, disseminate and curate a wide variety of content that can be enabled by technology, including photographs and videos.
- Communication and collaboration literacy: the ability to effectively and collaboratively communicate across the multiple opportunities that can be enabled by technology, including social media and online discussion boards.
- Identity management and security literacy: learners' ability to effectively maintain personal information about themselves and others.

Although there is an increasing emphasis on developing digital literacies whilst at school before commencing basic medical education, many learners will need to further develop both the range and depth of abilities. This also applies to many teachers in medical education.

Future trends in independent learning and distance learning

Technology will continue to evolve and be adopted for independent learning and distance learning. Machine learning to develop self-regulated learning attributes in basic medical education and the integration of learning and clinical systems for postgraduate medical education and continuing professional development are already on the near horizon. Personal learning environments for individual learners will be required to provide a focus for independent learning, with components that can record the learning process and curate the learning resources.

Performance assessment and feedback in medical education has a predominant focus on competence outcomes but there is increasing interest in the process by which a learner achieves these outcomes. Self-regulated learning can be assessed using microanalysis and this can inform feedback, such as in making a diagnosis or performing a technical skill (Leggett et al., 2019). In addition, the use of technology and learning analytics can track how a learner attempts to meet their learning needs across a variety of learning resources on the internet. This approach can be useful as evidence of engagement, especially in continuing professional development.



Tip

Although the focus of self-regulated learning and independent learning is on the individual learner, there is increasing interest in coregulation by groups of learners.

This trend is associated with the increasing interest in multidisciplinary learning and interprofessional education across the continuum of medical education, from basic medical education to continuing professional development.



Tip

A major challenge for both teachers and learners is the development of the essential attributes related to the evaluation of learning resources and digital literacies.

Increasingly, both teachers and learners will also need to collaboratively curate learning resources, with the development of online systems that can rapidly access a wide variety of evaluated learning resources that can be used to answer a specific learning need.

Lastly, it is important to remember that this is a fast-moving field. Ten years ago, teachers might have been justified in saying that online distant learning is effective in

certain domains (e.g., learning knowledge) but not in others (e.g., in learning procedural skills). However, the advent of virtual reality means that learners can learn certain procedural skills online ([Bernardo, 2017](#); [Pfandler et al., 2017](#)). Similarly, the culture of using online mobile learning resources in the workplace is changing. In the past, healthcare professionals in training might have felt uncomfortable about using their mobile phone in the workplace but increasingly, it is viewed as just another tool ([Joyne & Fuller, 2016](#); [Patel et al., 2015](#)).



Tip

In a time of rapid technological and educational progress, both teachers and learners should continually question their approach to teaching and learning, especially because younger learners have grown up with technology and they increasingly see that using technology is simply another way that they can learn.

Summary

Independent learning is essential for postgraduate medical education and continuing professional development, with learners taking responsibility to effectively meet their learning needs that they identify from daily professional practice. The aim is to ensure that doctors have the appropriate knowledge, skills and professional attitudes that are required for safe and high-quality care. Independent learning is developmental and requires the development of self-regulated learning attributes through teacher-guided active learning opportunities during basic medical education and postgraduate medical education, such as problem-based learning and flipped classrooms.

Technology provides increasing opportunities for distance learning, with access to and creation of a wide variety of learning resource outside the traditional classroom. There has been increasing use of free open access learning opportunities, such as FOAM education. Increasingly, ubiquitous learning occurs at any time and in any location, and is enabled by ubiquitous technology, using any device, in any location and in any format.

A major challenge for both teachers and learners is the evaluation of learning resources and digital literacies that are essential for independent learning and distance education.

References

- Association of American Medical Colleges (AAMC) Curriculum Inventory MedBiquitous Curriculum Inventory Working Group Standardized Vocabulary Subcommittee, 2016 Association of American Medical Colleges (AAMC) Curriculum Inventory MedBiquitous Curriculum Inventory Working Group Standardized Vocabulary Subcommittee. *Curriculum Inventory standardized instructional and assessment methods and resource types (March 2016 version)* Washington, DC: Association of American Medical Colleges; 2016;
<https://medbiq.org/curriculum/vocabularies.pdf>.
- Bernardo, 2017 Bernardo A. Virtual reality and simulation in neurosurgical training. *World Neurosurgery*. 2017;106:1015–1029.
- Brockett and Hiemstra, 2018 Brockett RG, Hiemstra R. *Self-direction in adult learning: perspectives on theory, research and practice* New York: Routledge; 2018.
- Hattie and Clarke, 2018 Hattie J, Clarke S. *Visible learning: feedback* New York: Routledge; 2018.
- Health Education England: London, 2018 Health Education England: London. (2018). A Health and Care Digital Capabilities Framework. Available from
<https://www.hee.nhs.uk/sites/default/files/documents/Digital%20Literacy%20Framework.pdf>
- Higher Education Academy (2019) Higher Education Academy: York. (2019). Independent Learning. Available from
https://www.heacademy.ac.uk/system/files/resources/independent_learning.pdf
- Joyes and Fuller, 2016 Joyes V, Fuller R. Legitimation, personalisation and maturation: using the experiences of a compulsory mobile curriculum to reconceptualize mobile learning. *Medical Teacher*. 2016;38(6):621–627.
- Leggett et al., 2019 Leggett H, Sandars J, Roberts T. Twelve tips on how to provide self-regulated learning (SRL) enhanced feedback on clinical performance. *Medical Teacher*. 2019;41(2):147–151.
- Meyer et al., 2008 Meyer B, Haywood N, Sachdev D, Faraday S. *What is independent learning and what are the benefits for students?* London: Department for Children, Schools and Families Research Report 051; 2008; [http://www.curee.co.uk/files/publication/\[site-timestamp\]/Whatisindependentlearningandwhatarethebenefits.pdf](http://www.curee.co.uk/files/publication/[site-timestamp]/Whatisindependentlearningandwhatarethebenefits.pdf).
- Patel et al., 2015 Patel R, Green W, Shahzad MW, Larkin C. Use of mobile

- clinical decision support software by junior doctors at a UK teaching hospital: identification and evaluation of barriers to engagement. *Journal of Medical Internet Research Mhealth Uhealth*. 2015;3(3):e80.
- [Pfandler et al., 2017](#) Pfandler M, Lazarovici M, Stefan P, Wucherer P, Weigl M. Virtual reality-based simulators for spine surgery: a systematic review. *The Spine Journal*. 2017;17(9):1352–1363.
- [Schunk and Greene, 2017](#) Schunk DH, Greene JA. *Handbook of self-regulation of learning and performance* New York: Routledge; 2017.
- [Slotnick, 2001](#) Slotnick HB. How doctors learn: education and learning across the medical-school-to-practice trajectory. *Academic Medicine*. 2001;76(10):1013–1026.
- [World Federation for Medical Education, 2015](#) World Federation for Medical Education: London. (2015). WFME Global Standards for Quality Improvement 2nd edition. Available from <https://wfme.org/standards/>.

SECTION 3

Educational Strategies and Technologies

OUTLINE

- 16 Outcome-Based Education
- 17 Integrated Learning
- 18 Interprofessional Education
- 19 Problem-Based Learning
- 20 Team-Based Learning
- 21 Digital Technologies in Medical Education

Outcome-Based Education

Eric Holmboe and Ronald M Harden

Trends

- Adoption of outcome-based medical education has accelerated, in part because of growing and changing health and healthcare needs of patients and populations.
- The establishment of outcome- (competency-) based education is now a key feature in curriculum planning.
- Milestones and entrustable professional activities (EPAs) are increasingly used to facilitate the implementation of outcome-based education.

Key concepts

- Outcome competencies: competencies required for practice are clearly articulated.
- Progressive sequencing: competencies and their developmental markers are sequenced progressively.
- Tailored learning experiences: learning experiences facilitate the developmental acquisition of competencies.
- Competency-focused instruction: teaching practices promote the developmental acquisition of competencies.
- Programmatic assessment: assessment practices support and document the developmental acquisition of competencies.

Introduction

A move from process to outcome

The seeds of the outcome-based moment were actually planted some time ago. McGaghie and colleagues argued in a World Health Organization (WHO) publication for an outcome-based approach to medical education (McGaghie & Lipson, 1978). In the years that followed, policy makers began to recognize the pernicious quality and safety problems within the healthcare system culminating in a number of landmark reports by the end of the 20th century (Frenk et al., 2010; Institute of Medicine (IOM), 2001). Over the last 20 years there has been a dramatic change, with consideration of the competencies and abilities expected of a doctor high on the agenda. Indeed, it can be argued that the move to outcome-based education (OBE) has been the most significant development in medical education in the past 1 or 2 decades: more important than the changes in educational strategies, such as problem-based learning; in instructional methods, such as the use of new learning technologies; and in approaches to assessment, including the use of portfolios. All of these are important. They are, however, a means to an end: what matters are the abilities gained by the doctor as a result of the educational experience.

One of the most effective ways a teacher can facilitate students' learning is to discuss the expected learning outcomes with them on day 1 of the course. A vision of the type of doctor to be graduated and the associated learning outcomes are the first two of the 10 questions to be answered in the development of a curriculum as described in Chapter 2. Only when these have been specified can we consider the content of the curriculum, the teaching and learning methods, the educational strategies and the approach to student assessment to be adopted (Fig. 16.1).

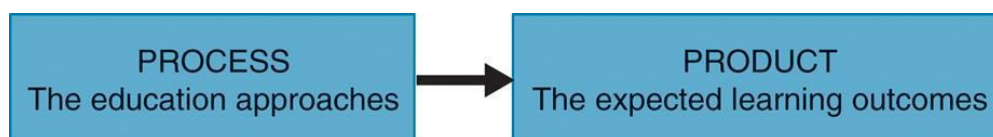


FIG. 16.1 In outcome-based education there is a move from an emphasis on process to an emphasis on outcome abilities of the graduate.

There has been a change in emphasis from process, where what matters is the education approach to outcomes, where the abilities and attitudes of the graduates are of key importance. In other words, the focus should be on what the new graduate can do in service of the public and healthcare system. This is the essence of OBE. The use made of simulators and e-learning, team-based and interprofessional approaches to the curriculum and assessment techniques, such as the OSCE and the Mini-CEX are important and are addressed in other chapters in this book. Their contribution to the education programme, however, must be guided by the expected learning outcomes.



"A good archer is not known by his arrows but by his aim."

Thomas Fuller

The trend towards outcome-based education

OBE is now at the cutting edge of curriculum development internationally. The United Kingdom's General Medical Council (GMC) guidelines for medical schools, *Tomorrow's Doctors*, changed from an emphasis in 1993 on issues, such as integration, problem-based learning and the abuse of lectures, to guidelines in 2003, 2009 and most recently in 2015 that highlighted the expected learning outcomes to be achieved on completion of the undergraduate course. These changes also importantly signify that educational guidelines, like clinical guidelines, need to change and be updated over time.



"In line with current educational theory and research we [the UK's General Medical Council] have adopted an outcomes-based model. This sets out what is to be achieved and assessed at the end of the medical course."

Rubin & Franchi-Christopher (2002)

The 2013 and 2014 AMEE conferences saw continued increases in the number of presentations on the topic from multiple researchers and educators around the world. The 4th Asia Pacific Medical Education Conference (APMEC) in Singapore had OBE as its theme.

The Association of American Medical Colleges (AAMC) has also taken a further step into OBE with the launch in 2014 of the core entrustable professional activities for entering residency (CEPAER) initiative ([Englander, 2014](#)). This initiative was partly in response to continued frustration of residency programme directors that too many medical schools' graduates are insufficiently prepared for residency. In Canada, the CanMEDS recommendations from the Royal College of Physicians and Surgeons of Canada and in the United States, the Accreditation Council for Graduate Medical Education (ACGME) areas of competence set out the expected learning outcomes in postgraduate education. Finally, AMEE and the International Competency-Based Medical Education (ICBME) consortium have sponsored two international summits (2016 and 2019) to take stock of progress and ongoing innovation regarding CBME and OBE. Finally, the rise of milestones and entrustable professional activities is a clear signal the world has moved from OBE principles and philosophy to widespread implementation.



"Education must be based on the health needs of the populations served... Competency-based education (CBE) is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs."

Carraccio et al. (2015)

Why the move to outcome-based education?

OBE is not some passing fad that lacks an educational underpinning. Although there has been some opposition to the approach, there are sound reasons for the position OBE now has at the forefront of education thinking. Here are some of the arguments for adopting OBE.

Attention to quality of care and neglected areas of competence

Multiple reports from the WHO, Organization for Economic Cooperation and Development (OECD), the Commonwealth Fund (CMWF) among others have reported on persistent gaps in quality and safety across the globe ([Mossialos et al., 2015](#)). Substantial and unwarranted variation in healthcare delivery plagues all health systems. In addition, the Institute of Medicine (IOM) report and adverse events and near-miss reporting in the United Kingdom have documented high rates of preventable medical errors ([IOM, 2001](#); [NAM, 2015](#); [Shaw et al., 2005](#)). This has understandably led policy makers to look to the medical education enterprise as part of the solution by better preparing health professionals for 21st century practice.

Consideration of the expected learning outcomes for an educational programme leads to a questioning of the validity of what is currently taught, and thus possible omissions or neglected areas can be identified. These can include communication skills, clinical reasoning, decision making, self-assessment, quality and safety improvement skills, interprofessional teamwork, creativity, patient safety and social responsibility: all important abilities for the practising doctor. The need to specify the abilities expected of our students on graduation and the delivery of a course of studies to achieve this is a message with which it is difficult to disagree ([Crosson et al., 2011](#)).

The problem of information overload

Advances in medicine and the medical sciences, with the doubling of knowledge every 2 years, pose a significant problem for the medical curriculum. Whereas the length of the course has remained relatively constant, what the student might be expected to learn has expanded hugely. No longer can we say to students, *"I cannot say precisely what I want you to learn from the course; just do your own thing."* We need to specify more clearly from the wide range of possibilities what it is we expect the student to learn.

Assessment of the learner's progress and the continuum of education

The need for a more seamless transition between the undergraduate, postgraduate and continuing phases of education is now accepted. Implicit in this is a clear statement of the learning outcomes expected of the student or trainee, for example the required

communication skills, prescribing skills or mastery of practical procedures, at the end of each stage before they move on to the next phase of their training. Clarity is also necessary with regard to the required achievements by learners as they progress through each phase of the training programme, including the 4, 5 or 6 years of the undergraduate curriculum. It is useful to chart a student's progress towards each of the learning outcomes (Fig. 16.2).

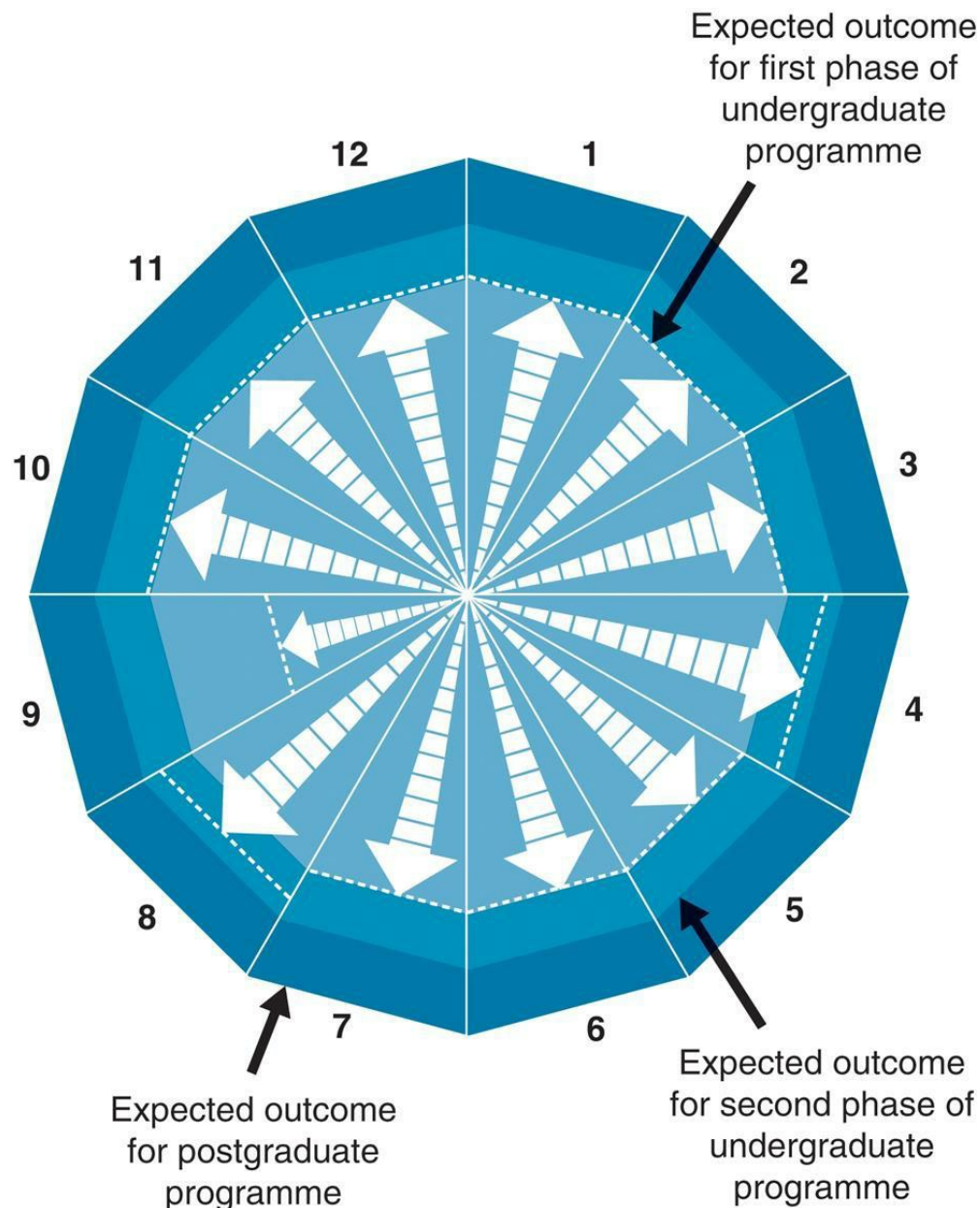


FIG. 16.2 A representation of progress by a first-phase student in relation to each of 12 learning outcome domains. The expected progress for each outcome is indicated by the inner target for the first phase of the programme, by the middle target for the second phase of the curriculum and by the outer target for postgraduate training. (From Harden, 2007. With permission.)

Learning outcomes provide a vocabulary to support the planning of the continuum of medical education across the different phases.

The student's progress in each of the outcome domains can be looked at from different perspectives ([Harden, 2007](#)):

- Increased breadth, for example, extension to new topics or different practice contexts.
- Increased difficulty, for example, more advanced or in-depth consideration.
- Increased utility and application to medical practice, for example, a move from theory to practice and integration of what is learned into the work of a doctor.
- Increased proficiency, for example, more efficient performance with fewer errors and less need for supervision.

Student-centred and individualized learning



"When we talk about individualisation ... we mean the ability of educational programs to adjust to meet students' and residents' learning needs and offer educational experiences that acknowledge differences in background, preparation, and rate of mastering concepts and skills, in contrast to the current one-size-fits-all approach."

[Cooke et al. \(2010\)](#)

As described in [Chapters 2 and 48](#), there is a move to student-centred education and independent learning. A clear understanding of the required learning outcomes by the teacher and student is necessary if the student is expected to take more responsibility for his or her own learning. Standardization of learning outcomes and individualization of the learning process was one of four goals for medical education identified in the Carnegie Foundation for the Advancement of Teaching Report, Educating Physicians ([Cooke et al., 2010](#)). Clearly stated learning outcomes, Cooke and colleagues suggest, contribute to increased efficiency of education, tailoring the education to the needs of the individual learner and possibly reducing (or lengthening) the duration of training time for a trainee. Student centeredness also requires attention to helping learners engage in the regulation of their learning with a keen focus on goal setting, feedback seeking behaviours, self-motivation and self-monitoring of their learning. Finally, student-centred learning should adopt the principles of coproduction where learners and teachers work collaboratively to codesign, cocreate, implement and comanage educational programmes through partnership and colearning ([Englander et al., 2019](#)).

Accountability

The different stakeholders, including students, teachers, the profession, the public and government, now expect a clear statement of exit learning outcomes against which an education programme can be judged. No longer is it appropriate to see the programme

as some form of 'Magical Mystery Tour' where the endpoint of training is uncertain. This is even more important at a time of financial constraint where resources may be limited.



"There needs to be a clear definition of the end point of training and the competences which will need to be achieved."

Calman (2000)

A clear statement of learning outcomes is essential to support the current emphasis on academic standards and the accreditation of the education programme of a school. Learning outcomes are also important in the recognition of excellence in education in a medical school through programmes, such as the ASPIRE-to-excellence initiative (www.aspire-to-excellence.org).

Implementation of outcome-based education

Learning outcomes and instructional objectives

In OBE, the learning outcomes are identified, made explicit and communicated to all concerned. Recognition of the need to provide the learner with information about the end point and direction of travel is not new. In the 1960s, promoting the use of instructional objectives, Mager asked, if one doesn't know where one is going, how can one decide how to get there? Learning outcomes differ from instructional objectives, and five important differences can be recognized ([Harden, 2002](#)):

- Learning outcomes, if set out appropriately, are intuitive and user-friendly. They can be used easily in curriculum planning, in teaching and learning and in assessment.
- Learning outcomes are broad statements and are usually designed round a framework of 8 to 12 higher-order outcomes.
- The outcomes recognize the authentic interaction and integration in clinical practice of knowledge, skills and attitudes and the artificiality of separating these.
- Learning outcomes represent what is achieved and assessed at the end of a course of study and not only the aspirations or what is intended to be achieved.
- A design-down approach encourages ownership of the outcomes by teachers and students.

Outcome frameworks

Learning outcomes are commonly presented as an agreed-upon set of domains within a framework that describes the larger picture of the abilities expected of a doctor. The move to competency-based education has much in common with, and competency frameworks may be similar to outcome frameworks ([Albanese et al., 2008](#)). The Dundee three-circle model ([Fig. 16.3](#)) as adopted in the Scottish Doctor is an example of an outcome framework. It covers the following:

1. In the inner circle (doing the right thing): the technical competencies—what a doctor should be able to do, as classified in seven domains, for example, communication skills and practical skills and procedures.
2. In the middle circle (doing the thing right): the intellectual, emotional and analytical competencies—how the doctor approaches his or her practice. This includes an understanding of basic and clinical sciences, appropriate attitudes and appropriate judgement and decision making.
3. In the outer circle (the right person doing it): the personal intelligences—the doctor as a professional including the role of the doctor and the doctor's personal development.

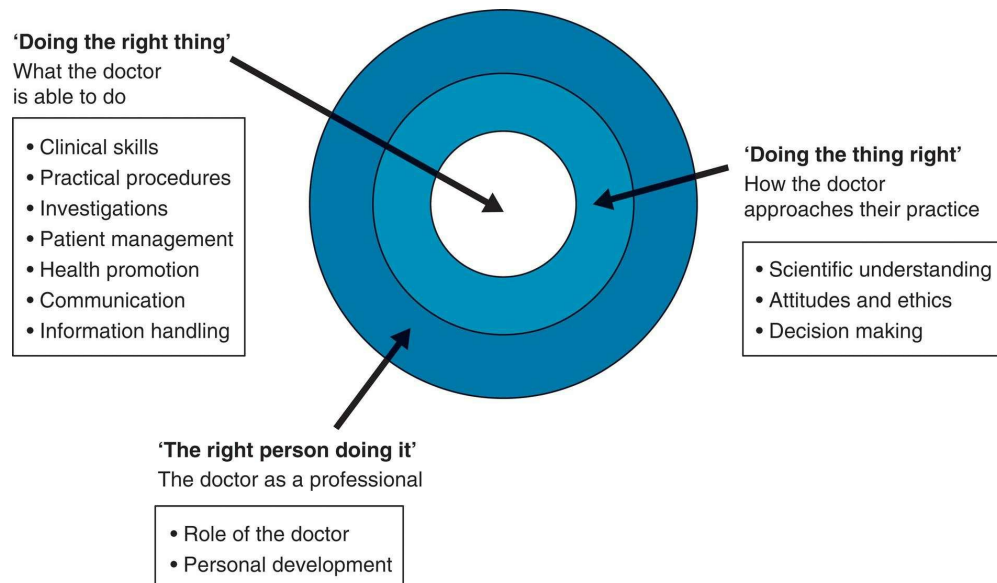


FIG. 16.3 The Dundee three-circle framework as adopted in the Scottish Doctor with 12 learning outcome domains. (From Scottish Deans' Medical Curriculum Group. (2008). *The Scottish Doctor*, Dundee: AMEE.)

The global minimum essential requirements (GMERs) specification used a similar framework (Schwarz & Wojtczak, 2002). The ACGME defined six general competencies thought to be common to physicians training in all specialties (Leach, 2004). These are related to the Scottish Doctor outcomes in Fig. 16.4. The CanMEDS framework, recently updated and revised, is based on the seven physician roles: medical expert, communicator, collaborator, leader, health advocate, scholar and professional (Frank et al., 2015). Each principal domain in an outcome or competency framework can be specified in more detail. An outcome framework is one of the five core components of OBE defined by van Melle and colleagues (2019).

| The Scottish Doctor Learning Outcomes | | ACGME Outcome Project | | | | | |
|---------------------------------------|---|-----------------------|---------------------|---|--|-------------------|-------------------------|
| | | a Patient Care | b Medical Knowledge | c Practice-based Learning and Improvement | d Interpersonal and Communication Skills | e Professionalism | f System-Based Practice |
| A | 1 Clinical Skills | | | | | | |
| | 2 Practical Procedures | | | | | | |
| | 3 Patient Investigation | | | | | | |
| | 4 Patient Management | | | | | | |
| | 5 Health Promotion and Disease Prevention | | | | | | |
| | 6 Communication | | | | | | |
| | 7 Information Handling | | | | | | |
| B | 8 Scientific Basis | | | | | | |
| | 9 Attitude and Ethics | | | | | | |
| | 10 Decision Making | | | | | | |
| C | 11 Role of Doctor in Health System | | | | | | |
| | 12 Personal Development | | | | | | |

FIG. 16.4 The Accreditation Council for Graduate Medical Education (ACGME) and the

Selecting or preparing an outcome framework

When a set of learning outcomes is developed for the first time, there are the following possibilities with regard to the use of a framework:

- An existing framework, as described earlier, can be adopted.
- An existing framework can be modified to suit the specific needs of the education programme.
- A new framework can be developed. Any new framework should be checked against the criteria for an outcome framework as described in [Box 16.1](#).

Box 16.1

Criteria for an outcome/competency framework

- The framework is clear, unambiguous and intuitive to the users.
- It reflects accepted and defined areas of competence.
- The vision and mission of the programme are reflected in the domains chosen.
- It is manageable in terms of the number of outcome domains (usually 6–12).
- It supports the development of enabling outcomes in each of the domains.
- The relationship between different outcomes is indicated.

Implementing outcome-based education

An important step in implementing OBE is to determine what framework you will use to implement OBE. As described earlier, a number of countries have chosen to use a competency model to operationalize OBE. Competencies can be a valuable mechanism to describe the overarching outcomes. However, implementing competencies has proved challenging. This led to the development initially of parallel concepts, milestones and entrustable professional activities. Milestones provide narrative descriptors of the competencies and subcompetencies along a developmental continuum with varying degrees of granularity. Simply stated, milestones describe performance levels learners are expected to demonstrate for skills, knowledge and behaviours in the pertinent clinical competency domains. They lay out a framework of observable behaviours and other attributes associated with learners' development as physicians (Fig. 16.5). The ACGME now requires use of milestones as part of accreditation in the United States (Holmboe et al., 2015).

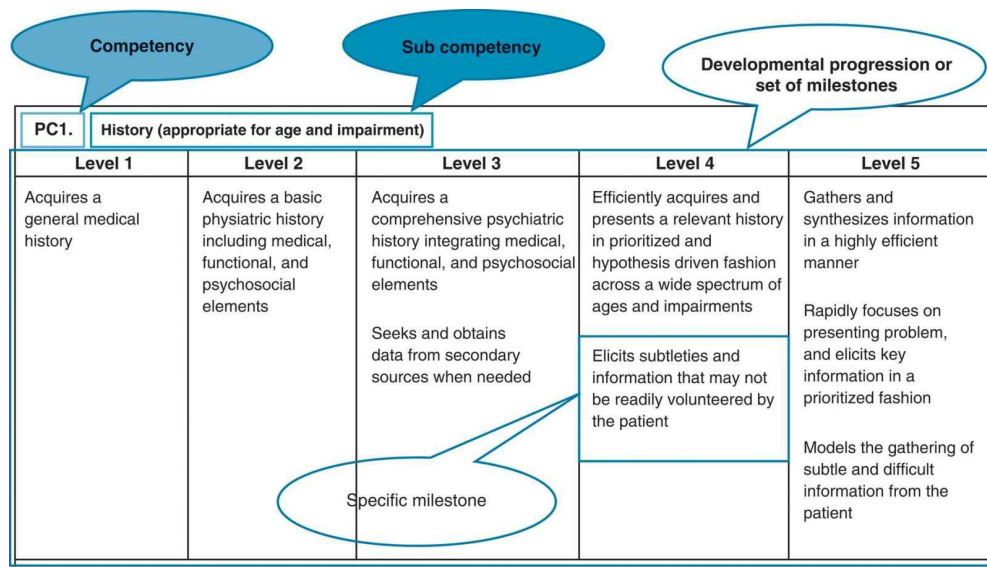


FIG. 16.5 Example template for the creation of the Accreditation Council for Graduate Medical Education (ACGME) specialty milestones describing five developmental stages for postgraduate training programmes. (From ACGME. With permission.)

Entrustable professional activities (EPAs) were originally conceptualized in the Netherlands and were first applied in physician assistant and obstetrics/gynaecology training. As defined by Ten Cate recently:



“EPAs are units of professional practice, defined as tasks or responsibilities that trainees are entrusted to perform unsupervised once they have attained sufficient specific competence. EPAs are independently executable, observable, and measurable in their

process and outcome, and, therefore, suitable for entrustment decisions.”

Ten Cate et al. (2016)

It is the activity that is ‘entrusted’ to the learner and EPAs should represent the core of the profession. Simply defined, EPAs describe what we expect a particular specialist to be able to do without supervision upon graduation from residency and fellowship. EPAs have become increasingly popular among a number of specialties in a number of countries as an approach to define more holistic outcomes for training programmes, using milestones as ‘building blocks’ to create EPAs that define the core activities of a specialty. Both milestones and EPAs can guide both assessment programmes and curriculum ([Ten Cate et al., 2015](#)).

An outcome-based curriculum

In OBE, decisions about teaching and learning methods, curriculum content, educational strategies, assessment, the educational environment and even student selection should be based on the specified learning outcomes ([Harden et al., 1999a](#)) ([Fig. 16.6](#)). To date, much of the attention in OBE has focused on the specification of learning outcomes and less on the implementation of an OBE approach in practice. There are two requirements for OBE. The first is that learning outcomes are clearly defined and presented. The second is that decisions relating to the curriculum are based on the learning outcomes specified. One can infer that a programme is outcome-based only if both conditions are met ([Spady, 1994](#)). Do not use learning outcomes as a window dressing for your courses or teaching programme. The learning outcomes need to inform the decisions you take as a teacher or trainee.

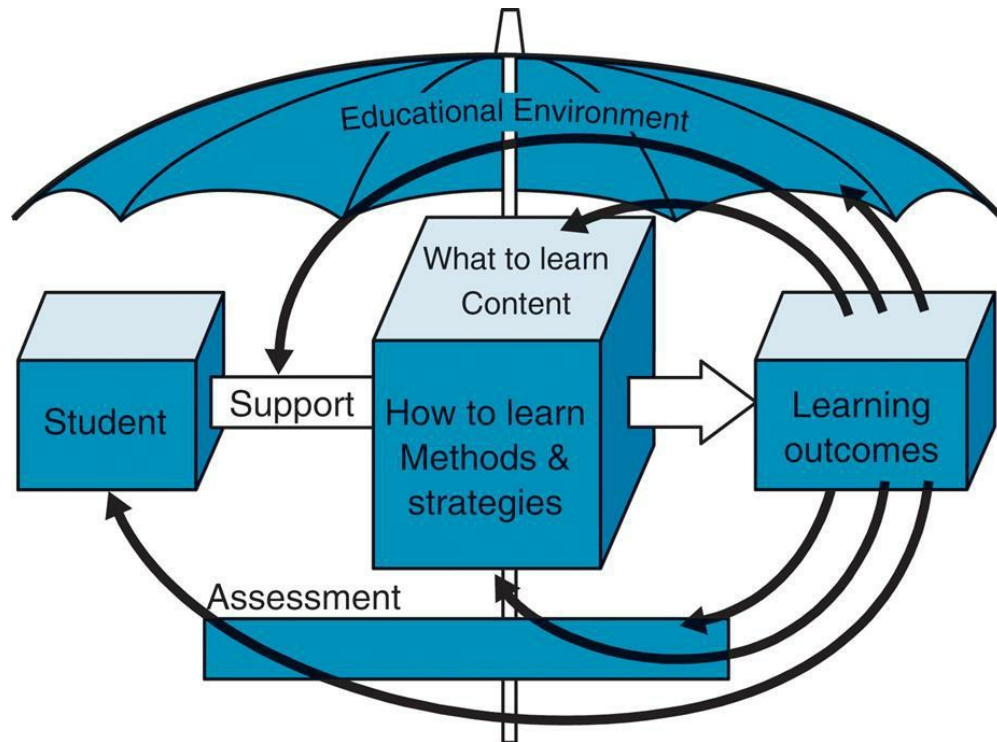


FIG. 16.6 A model for the curriculum emphasizing the importance of educational outcomes in curriculum planning. (From [Harden et al., 1999a](#). With permission.)

An outcome-based design sequence should be adopted in which the first step is the specification of the exit learning outcomes for the curriculum. The next step is to derive the outcomes for the different phases of the curriculum from these exit outcomes. A blueprint should then be developed relating each learning outcome for the phase to the learning opportunities and to the assessment. A combination of competencies, milestones and EPAs can help in these initial steps. The process is repeated for the courses within each phase, the units within each course and the learning activities within each unit. In this 'design-down' process, the outcomes for the phases, courses, units and learning activities should be aligned with and contribute to the exit outcomes.



"Teachers should be informed of and have easy access to written learning outcomes for their courses so that they can plan their teaching strategies and methods."

Subha Ramani, 2006

In OBE, there also has to be an acknowledgement that it is the teacher's responsibility to ensure that all students master the learning outcomes, and how this is achieved may vary from student to student.

Myths about outcome-based education

If there is a problem with OBE, it does not rest with the principle but with how it is implemented in practice.

There are a number of misconceptions or misunderstandings about OBE:

- Some teachers are concerned that OBE is concerned with detail and that the big picture may be missed. While this may have been true with the objectives movement in the 1960s, OBE is concerned with broad parameters for competence and metacompetence ([Frank et al., 2010](#); [Harden et al., 1999b](#)).
- Some teachers see OBE as a threat, bringing loss of their freedom or autonomy. On the contrary, OBE does not dictate teaching methods: the existence of an agreed-upon set of outcomes empowers teachers to develop their own programme that they believe will help the student to achieve the required learning outcomes.



"There is a fine line between the competency framework that emancipates learners and that which prevents their 'expansive learning'."

Dornan, 2010

- Others believe that OBE ignores trends in medical education and the move to student-centred learning. On the contrary, in OBE, students are 'active agents' empowered to take more, not less, responsibility for their own learning. In OBE, teacher and learners can engage in a coproduction relationship around curriculum and assessment ([Holmboe & Batalden, 2015](#)).
- Some teachers are concerned that OBE is about minimum competence. This need not be the situation. Learning outcomes can be specified at different levels of mastery as demonstrated in the Brown abilities ([Smith & Dollase, 1999](#)). In addition, milestones in use in several educational systems explicitly define aspirational levels of performance and development.

Summary

OBE is a key development and a response to current challenges facing medical education that offers many advantages. A statement of learning outcomes, often through competencies, milestones and EPAs, provides a language or vocabulary that helps to chart the progress of students through the different phases of education and to identify a learning programme to meet their personal needs.

Only when the end point of the journey is determined can the best way to get there be decided.

Learning outcomes should be specified using an appropriate outcome framework. An existing framework can be adopted or modified or a new framework created. Using the learning framework, outcomes should be developed for each course and learning experience. Decisions about the curriculum content, teaching methods, educational strategies and assessment should be related to the agreed learning outcomes.

References

- Albanese et al., 2008 Albanese MA, Mejicano G, Mullan P, et al. Defining characteristics of educational competencies. *Medical Education*. 2008;42(3):248–255.
- Calman, 2000 Calman KC. Postgraduate specialist training and continuing professional development. *Medical Teacher*. 2000;22(5):448–451.
- Carraccio et al., 2015 Carraccio C, Englander R, Van Melle E, et al. Advancing competency-based medical education: a charter for clinician-educators. International Competency-Based Medical Education Collaborators *Academic Medicine*. 2015;91(5):645–649.
- Cooke et al., 2010 Cooke M, Irby DM, O'Brien BC. *Educating physicians: a call for reform of medical schools and residency* San Francisco: Jossey-Bass; 2010.
- Crosson et al., 2011 Crosson FJ, Leu J, Roemer BM, Ross MN. Gaps In residency training should be addressed to better prepare doctors for a twenty-first-century delivery system. *Health Affairs*. 2011;30(11):1–7.
- Englander, 2014 Englander R. *Core entrustable professional activities for entering residency* Association of American Medical Colleges 2014.
- Englander et al., 2019 Englander R, Holmboe E, Batalden P, et al. Coproducing health professions education: a prerequisite to coproducing health care services. *Academic Medicine*. 2019;95(7):1006–1013.
- Frank et al., 2015 Frank JR, Snell L, Sherbino J. *CanMEDS 2015 Physician Competency Framework* Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.
- Frank et al., 2010 Frank JR, Snell LS, Ten Cate O, et al. Competency-based medical education: theory to practice. *Medical Teacher*. 2010;32(8):638–645.
- Frenk et al., 2010 Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923–1958.
- Harden, 2002 Harden RM. Learning outcomes and instructional objectives: is there a difference?. *Medical Teacher*. 2002;24(2):151–155.
- Harden, 2007 Harden RM. Learning outcomes as a tool to assess progression. *Medical Teacher*. 2007;29(7):678–682.
- Harden et al., 1999a Harden RM, Crosby JR, Davis MH. An introduction to

- outcome-based education. *Medical Teacher*. 1999a;21(1):7–14.
- [Harden et al., 1999b](#) Harden RM, Crosby JR, Davis MH, Friedman M. From competency to meta-competency: a model for the specification of learning outcomes. *Medical Teacher*. 1999b;21(6):546–552.
- [Holmboe and Batalden, 2015](#) Holmboe ES, Batalden P. Achieving the desired transformation: thoughts on next steps for outcomes-based medical education. *Academic Medicine*. 2015;90(9):1215–1223.
- [Holmboe et al., 2015](#) Holmboe ES, Yamazaki K, Edgar L, et al. Reflections on the first 2 years of milestone implementation. *Journal of Graduate Medical Education*. 2015;7(3):506–511.
- Institute of Medicine, 2001 Institute of Medicine. *Crossing the quality chasm: a new health system for the twenty-first century* Washington, DC: National Academies Press; 2001.
- [Leach, 2004](#) Leach DC. A model for GME: shifting from process to outcomes A progress report from the Accreditation Council for Graduate Medical Education. *Medical Education*. 2004;38(1):12–14.
- [McGaghie and Lipson, 1978](#) McGaghie WC, Lipson L. *Competency-based curriculum development in medical education: an introduction* Geneva: World Health Organization; 1978.
- [Mossialos et al., 2015](#) Mossialos E, Wenzl M, Osborn R, Anderson C. *International profiles of health care systems, 2014: Australia, Canada, Denmark, England, France, Germany, Italy, Japan, The Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, and the United States* New York: The Commonwealth Fund; 2015; (Retrieved August 11, 2015). Available from: www.commonwealthfund.org/publications/fund-reports/2015/jan/international-profiles-2014.
- [National Academy of Medicine, 2015](#) National Academy of Medicine. *Improving diagnosis in healthcare* Washington, DC: National Academy Press; 2015.
- [Rubin and Franchi-Christopher, 2002](#) Rubin P, Franchi-Christopher D. New edition of tomorrow's doctors. *Medical Teacher*. 2002;24(4):368–369.
- [Schwarz and Wojtczak, 2002](#) Schwarz MR, Wojtczak A. Global minimum essential requirements: a road towards competency-oriented medical education. *Medical Teacher*. 2002;24(2):125–129.
- [Shaw et al., 2005](#) Shaw R, Drever F, Hughes H, et al. Adverse events and near miss reporting in the NHS. *Quality and Safety in Health Care*. 2005;14(4):279–283.

- [Smith and Dollase, 1999](#) Smith SR, Dollase R. Planning, implementing and evaluating a competency-based curriculum. *Medical Teacher*. 1999;21(1):15–22.
- [Spady, 1994](#) Spady WG. *Outcome-based education: critical issues and answers* Arlington, VA: The American Association of School Administrators; 1994.
- [Ten Cate et al., 2015](#) Ten Cate O, Chen HC, Hoff RG, et al. Curriculum development for the workplace using Entrustable Professional Activities (EPAs): AMEE Guide No 99. *Medical Teacher*. 2015;37(11):983–1002.
- [Ten Cate et al., 2016](#) Ten Cate O, Hart D, Ankel F, et al. Entrustment decision making in clinical training. International Competency-Based Medical Education Collaborators *Academic Medicine*. 2016;91(2):191–198.
- [Van Melle et al., 2019](#) Van Melle E, Frank JR, Holmboe ES, et al. A core components framework for evaluating implementation of competency-based medical education programs. *Academic Medicine*. 2019;94(7):1002–1009.

Integrated Learning

Neil Osheroff

Trends

- There is a continued emphasis on the development of integrated medical school curricula.
- Medical school curricula increasingly are featuring early exposures to the clinical workplace coupled with the integration of basic sciences across all phases of the curriculum.
- The incorporation of small group active learning sessions to help foster causal networks and integration at the session level are becoming increasingly prominent in medical school curricula.

Key concepts

- Integration: a purposeful effort to make explicit and specific causal connections between subjects.
- Contextualization: an organizational framework that uses causal networks to allow information to be retained and more readily applied to clinical settings.
- Conceptual coherence: concepts whose contents form a grouping that makes sense to the learner.

Introduction

There is considerable evidence that integrated learning better meets the needs of adult learners. The concept of integrated teaching and learning in undergraduate medical education goes back as far as Flexner's *Medical Education in the United States and Canada* in 1910, where the author argued for the integration of scientific knowledge into the care of patients (Flexner, 1910). This call for integration has resonated in every subsequent major report on medical education. For example, *Physicians for the Twenty-First Century*, which was commissioned by the Association of American Medical Colleges, stressed in 1984 that 'basic science and clinical education should be integrated to enhance the learning of key scientific principles and concepts and to promote their application to clinical problem solving' (AAMC, 1984). The Howard Hughes Medical Institute- Association of American Medical Colleges joint report on the *Scientific Foundations of Future Physicians* in 2009 stated that the undergraduate 'medical school curriculum should be integrated across disciplines' (HHMI-AAMC, 2009). Finally, in the centennial year of the original Flexner report, one of the key points of the report of the Carnegie Foundation for the Advancement of Teaching *Educating Physicians: A Call for Reform of Medical School and Residency* was that that curricula should 'integrate basic, clinical, and social sciences' (Cooke et al., 2010).

Despite all of the calls for integration in medical education, the implementation of integrated learning has remained a challenge. Therefore this chapter will explore the concept of integration, including the theoretical basis and benefits of integration. It will also discuss practical methodologies that promote integrated learning and barriers to achieving this goal.



"The implementation of integrated learning presents a challenge."

What is meant by integration?

To understand integrated learning, we must first define what we mean by integration. It has been described as the action or process of combining two or more things in an effective way, the act of combining, adding, or blending parts into a functioning or unified whole, or the deliberate unification of separate areas of knowledge. With regard to medical education, one of the best definitions comes from [Harden et al. \(1984\)](#), who suggested that integration is *“the organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or department.”*

Rationale for integrated learning

The rationale underlying integrated learning is to provide bridges between topics that are logically linked. This provides the learner with context that allows them to more naturally organize the information into a higher order structure. Because isolation of concepts or topics provides little context, it encourages memorization as opposed to higher order learning. As an example, teaching carbohydrate metabolism without medical context reduces the subject to a series of chemical pathways that are difficult for medical students to learn, retain or use when faced with a patient with metabolic disorders. This isolation reduces important pathways to rote memorization. Conversely, teaching carbohydrate metabolism in the context of other metabolic pathways, and disorders, such as diabetes, provides causal relationships between the metabolic pathways and the disorders. As a result, an organizational framework in which metabolism can be learned (the process of acquiring information) rather than memorized (the process of storing information) can be formed. Furthermore, as described later in the chapter, this contextualization and development of causal networks allows the information to be retained and more readily applied to clinical settings.



Tip

Integrated learning provides bridges between topics that are logically linked.

Curricular/program integration

Integration can be applied at many levels of medical education, each contributing to integrated learning. The first level of integration that is developed and applied at many medical schools is at the curricular level ([Brauer & Ferguson, 2015](#); [Finnerty et al., 2010](#); [Loftus, 2015](#)). The 11 step integration ladder ([Fig. 17.1](#)) described by [Harden \(2000\)](#), provides an excellent framework to understand the evolution of an integrated curriculum.



Transdisciplinary

Interdisciplinary

Multidisciplinary

Complementary

Correlation

Sharing

Temporal
Coordination

Nesting

Harmonization

Awareness

Isolation

FIG. 17.1 The integration ladder. The eleven steps of the integration ladder are described in the text. (From [Harden, 2000](#).)

The majority of medical school curricula 20 to 30 years ago were located at the base of the ladder, or the isolation step. At this level, courses are discipline-based, usually coordinated by individual departments, with little to no communication or coordination between them. Each course acts in isolation with regard to information, teaching styles, and assessment strategies.

At the awareness rung, courses are still discipline-based, but teachers in some courses are at least made aware of what is covered in other parts of the curriculum. This awareness allows some level of coordination between some subjects. For example, having knowledge of what is taught in a biochemistry course can help an instructor in a later physiology course to better teach a subject, such as diabetes.

Awareness is followed by harmonization, in which instructors from one course may actively seek out information that is taught in other discipline-based courses, opening lines of communication and providing connections between courses.

Moving to the nesting rung, instructors may target skills related to other subjects that fall outside of the discipline-based course. It is an early attempt to link the goals of a discipline-based course to the broader goals of a curriculum.

Up to this point, much of the integration is handled at the instructor-to-instructor levels, without a general coordination across the curriculum. The move to temporal coordination requires integration on a course level. Although courses may still be discipline-based, there is an agreement between at least two courses to interdigitate teaching sessions to help coordinate learning. Thus, the discussion of the cell cycle in a cell biology course might be followed by a lecture on nucleic acid processes in a biochemistry course. Although placed in temporal proximity, links between the subjects are still by and large left to the student to decipher.

Temporal coordination is reinforced on the sharing rung in which instructors from two disciplines purposely joint teach a subject. For example, a cell biologist and a physician may pair to team teach the basics of connective tissue and diseases related to dysfunction of these tissues. Although sharing can lead to a more complete integration, it is often seen as a special case to be used in selected parts of a course.

The correlation step represents a true integration process. Although courses may still be discipline-based, integrated sessions are introduced to the students as part of the course. For example, a small group clinically based weekly session may be introduced in a course to help the students better understand how the discipline relates to medicine and the care of patients.

In the complementary programme, courses may still be discipline-based, but include a majority of integrated sessions.

The multidisciplinary step for the first time abandons discipline-based courses in favour of courses that are organized by a higher order or broader framework. For example, courses can be organized on the basis of organs and their functions, disease symptoms, and so on. For example, in an organ-based course, sessions on the liver could encompass discussions of the biochemistry and physiology of the liver along with

the gross- and microanatomy of the organ, diseases associated with the liver, and treatment of those diseases, including pharmacologic aspects. In this course, however, individual disciplines may still be emphasized and compartmentalized to a certain degree.

The interdisciplinary rung is similar to the multidisciplinary step. However, the perspective of individual disciplines may give way to the perspective of the overall theme of the course. As discussed later, the move to interdisciplinary courses is a major step toward an integrated curriculum that can be viewed with suspicion by those with strong disciplinary ties ([Bolender et al., 2013](#)). One of the overarching tenets of an integrated curriculum is that everyone has to give up something of themselves (or their discipline) to make it work.

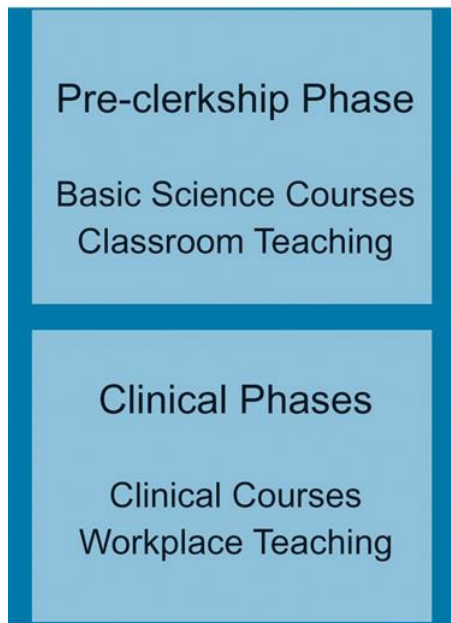
Very few curricula achieve the final step on the ladder, the transdisciplinary rung, across the time in medical school. It is often reserved for individual portions of the curriculum. For example, in an integrated, or longitudinal, clerkship, students are not attached to any specific clinical service. Rather, they follow individual patients and move through the different services along with their patients.

Horizontal versus vertical integration

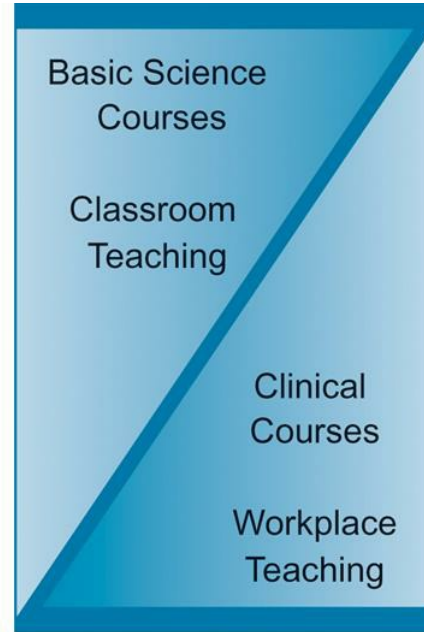
It is notable that even within an integrated curriculum, there are different ways to view and achieve integration across the medical school experience ([Wijnen-Meijer et al., 2010](#)). The most common form of integration is horizontal. Horizontal integration refers to integration across disciplines and courses, usually over a specific timeframe. For example, integration across a series of basic science courses in the preclerkship phase of medical school would be an example of horizontal integration. By understanding what is taught in each course and by planning the courses to build upon one another, students have a logical framework for undergoing their training.

Vertical integration refers to integration across larger time frames, such as integration between the preclerkship and clinical phase of the medical curriculum. It also refers to integration across different classes of disciplines, such as linking information from basic science courses with courses that focus on social sciences or clinical skills. Examples would be the teaching of heart or eye examinations in coordination with cardiology or neuroscience courses. Similarly, linking genetic testing in a basic science course with a discussion of the ethics of genetic testing in a medical humanities (or social science) course would be another.

Vertical integration can take different forms ([Fig. 17.2](#)). Traditionally, medical schools used the 'H-shaped' model. This model started with classroom-based basic science education in the early years of medical school (above the centre bar in the H), and transitioned to a workplace-based clinical curriculum in the latter years (below the centre bar in the H). The H-style medical curriculum has little if any integration between the preclerkship and clinical phases. In many schools, this model has been replaced by a 'Z-shaped model' in which there is a more gradual progression from the basic sciences to the clinical workplace. In this model, basic and clinical sciences are taught throughout the curriculum, with basic sciences being more heavily represented early in the curriculum and clinical sciences being more heavily represented in the later years. Similarly, over the course of training, learning undergoes a transition from an emphasis on structured classroom-based courses to less structured workplace-based clinical experiences. An even more integrated curricular model is the 'spiral' curriculum. In this model, basic, social, and clinical sciences are integrated across time and subject matter in all phases of the curriculum ([Bandiera et al., 2013](#)).



H-Shaped Model of Curriculum Integration



Z-Shaped Model of Curriculum Integration

FIG. 17.2 Models for vertical integration of medical school curricula. The 'H-shaped' model, shown on the left, represents the traditional curriculum in which basic sciences are taught during the preclerkship phase and clinical sciences are taught in the clinical phases. This model has given way to the 'Z-shaped' model in many medical schools. In the Z-shaped model, both basic and clinical sciences are taught throughout medical school, with a heavier emphasis on basic sciences early in the curriculum and a heavier emphasis on clinical sciences in the later phases. (From Wijnen-Meijer, et al., 2010.)

Course level versus session level integration and the benefits of causal networks

To have a truly integrated curriculum, there needs to be integration at the course level, with courses being at the multidisciplinary or interdisciplinary rung of the integration ladder. Integration at the course level starts with goals and learning objectives that transcend individual disciplines and speak to a higher organization. For example, the first goal of the first science block of the Vanderbilt University School of Medicine MD curriculum is to familiarize students with the *“biomolecules, reactions, and processes that constitute human health and disease at the molecular level.”* Disciplines taught in the course, such as biochemistry, genetics, and cell biology, are not mentioned as part of the goal.

Integration at the course level requires a spatial and temporal proximity between different basic science disciplines, as well as between basic, social, and clinical sciences. However, for the learner to attain the true benefits of integration by creating ‘conceptional coherence’ (concepts whose contents form a grouping that makes sense to the learner), integration needs to take place at the session level and in the mind of the learner. Simply creating proximity between subjects (teaching carbohydrate metabolism and diabetes in the same session) or contextualizing them (teaching that carbohydrate metabolism is important because of diabetes) may not guarantee cognitive integration. Rather, teaching must purposefully make explicit and specific causal connections to relate the subjects ([Kulasegaram et al., 2013; 2015](#)).

There are numerous advantages of using a causal approach to link subjects. Experimental studies indicate that when students learn the basic science explanation underlying disease symptoms, they retain the information better and show superior diagnostic accuracy immediately and after a delay as compared with a similar group of learners who were taught the disease and symptoms without the causal links between the two ([Lisk et al., 2016; Woods et al., 2006](#)). Furthermore, novice learners who were taught in a causal manner were better able to diagnose difficult cases both immediately after the sessions and after a delay ([Woods et al., 2007](#)). In parallel studies, students who were taught causal relationships were better able to transfer learning to new problems ([Cheung et al., 2019](#)) and displayed enhanced learning of novel related content ([Mylopoulos & Woods, 2014](#)).

To further explore the best way to establish a causal network between subjects, students were provided basic science and clinical information in one of four ways: intertwined and causally linked, basic science before clinical features, clinical features before basic science, or clinical features alone. Students taught in a causal manner displayed the highest knowledge upon immediate or delayed testing with relatively little drop off between the tests. Conversely, students taught in the other manners did less well in the initial test and displayed considerably poorer retention of knowledge ([Kulasegaram et al., 2015](#)). Thus, to achieve optimal integration, students must be taught causal relationships literally on a minute-to-minute basis.

Strategies to achieve integrated learning at the session level

Irrespective of the overall organization of the medical school curriculum, there are a number of ways that faculty can facilitate integrated learning at the session level to achieve the benefits described earlier. The first strategy that can be applied is to purposely link subjects that are being taught to other related topics in basic and clinical medicine. For example, discuss how a pathway relates to other cellular pathways, how it affects human health, and how alteration of the pathway leads to disease states. This form of integrated lecturing can be accomplished in any curriculum, even in one that is on the first step (isolation) of the curriculum ladder ([Harden, 2000](#)). Teaching in a manner that results in causal networks will appeal to students and help them to integrate the materials being taught ([van der Hoeven et al., 2020](#)). It can be accomplished by a single faculty member or a team, potentially comprised of a basic scientist and clinician. Integration can be enhanced if lectures incorporate an active teaching component, such as audience response systems or discussion questions that require students to apply what they are learning to clinical scenarios.



Tip

Purposely link subjects that are being taught to other related topics in basic and clinical medicine

Many medical schools are turning to the use of small group active learning sessions to help integrate the basic and clinical sciences. The two most prevalent types of sessions are those that use a problem-based learning (PBL, also called case-based learning or CBL) or a team-based learning (TBL) format. Two points need to be noted regarding these sessions. First, to be meaningful, PBL or TBL sessions must be incorporated routinely and consistently across the curriculum (or at least across the preclerkship phase). If used sporadically or with different formats in different courses, they lose much of their effectiveness. Second, the information learned in these sessions must be assessed. Some medical schools use small group sessions primarily to teach students how to work in team settings. If the information being discussed is not assessed, students do not take the sessions seriously and often see them as a misuse of their time.

The PBL format ([Donner & Bickley, 1993](#)) mimics the unfolding of a patient case. On the first day (with no prior introduction to the materials), students work through the case starting with the primary complaint and moving through the patient's history, test results, and discussions with their physician. In most schools, the diagnosis of the case is provided and students (as a group) generate their own learning objectives based on what they believe to be the pertinent aspects of the case. These might include research

on the basic sciences that underlie the normal and abnormal conditions, an explanation of all of the data presented, and an explanation of the proposed treatment. Students come back to the group on a second day to discuss what they have learned. A critical aspect of the PBL format is that each student needs to research all of the learning objectives. This way, each member of the group reaps the benefits of the integration and knowledge gained for all aspects of the case. It also leads to rich discussions between students that further adds to their understanding and to the integration of information. It is notable that in the PBL format, students use the case as a clinical framework to work their way back through the basic sciences to generate causal networks.



"A factor that enhances integration in problem-based learning is that students are placed in a similar 'psychological environment' to that in which they would apply their learning in future professional life"

Bandaranayake (2011)

The TBL format ([Levine & Hudes, 2013](#)) is a stylized form of a 'flipped classroom' in which students are provided with information (articles, videos, etc.) before the session that they are required to digest on their own. In general, the information is related to one or more of the basic sciences. Upon arrival in class, students take a short individual readiness assurance test (IRAT) to test their understanding of the information. The IRAT is followed by a group readiness assurance test (GRAT) on the same material. Having students retake the test in a group format allows them to see that the collective wisdom is greater than that of the individual. More importantly, discussions regarding the questions that precede committing to an answer helps foster teamwork and integration of the information. Once the GRAT is completed and discussed by the facilitator, groups are tasked with a series of clinical application questions. Groups share their answers with the class, which leads to a class-wide discussion on the merits or deficiencies of the different answers. As earlier, this discussion helps to integrate the information from the session. It is notable that in the TBL format, students use the basic science information described in the preclass materials as a framework to work their way through clinical scenarios, thus creating causal networks.

Assessment in an integrated curriculum

It is often said that assessment drives learning. Thus, if students are to be taught in an integrated manner and if that integration is important to the medical school, then students need to be assessed in an integrated manner. Consequently, the use of discipline-based 'factoid' multiple-choice questions, such as 'which of the following enzymes catalyzes the reaction shown' is to be discouraged. It is still fine to use multiple-choice questions, but they should be integrated and assess the ability of students to understand a larger picture. One way to accomplish this is to start questions with a clinical vignette and ask a question that assesses whether the student understands the causal links between the underlying basic and clinical sciences. Essay questions that ask students to explain the sciences behind a clinical scenario are also excellent.

One last point on examinations. Although courses can include weekly quizzes, and so on, there are benefits to having assessment strategies that incorporate larger longitudinal examinations. By assessing less frequently, students will have less of a 'binge and purge' mentality. In addition, the examination will assess more information, which will provide greater opportunities for questions to integrate materials across multiple disciplines.

Challenges to integration

The ability to integrate a curriculum comes with a number of challenges. First, if courses are controlled by discipline-based departments, it is often difficult for course directors to see beyond their individual discipline ([Bolender et al., 2013](#)). Thus, it is beneficial for control of the curriculum and individual courses to be transferred to a central administrative structure. Second, course directors need to move away from their discipline to think more holistically about their course. This is often a difficult process, but it is well worth the effort. Third, educational leaders need to become comfortable working in interdisciplinary teams that contain basic scientists, as well as clinicians. If a course or a curriculum is going to be integrated, it is necessary to have representatives from multiple disciplines, both basic and clinical, contribute to the conversation. Finally, faculty are often uncomfortable expanding their teaching into realms that are outside their expertise ([Dominguez & Zumwalt, 2020](#)). The move to integrated teaching requires that faculty open their minds to learning new knowledge and potential new teaching methodologies to educate the next generation of clinicians.

Summary

Integrated learning enhances understanding, the retention of knowledge, the learning of novel-related content, and diagnostic accuracy. However, achieving integrated learning comes with a number of challenges. Integration can be at the curricular/programme, course, or session level. Although integration at the curricular or course level sets expectations and the overall framework for training, it is the integration at the session level that provides the greatest benefits to the individual learner. Integration does not occur merely by a spacial and temporal proximity between subjects but requires a purposeful effort to make explicit and specific causal connections between subjects. It also requires faculty to look beyond their disciplines to teach in a manner that will enhance the learning of medical trainees.

References

- [AAMC, 1984](#) AAMC. *Physicians for the twenty-first century: Report of the project panel on the general professional education of the physician and college preparation for medicine* Washington, DC, USA: Association of American Medical Colleges; 1984.
- [Bandaranayake, 2011](#) Bandaranayake RC. *The integrated medical curriculum* London: Radcliffe; 2011.
- [Bandiera et al., 2013](#) Bandiera G, Boucher A, Neville A, Kuper A, Hodges B. Integration and timing of basic and clinical sciences education. *Medical Teacher*. 2013;35:381–387.
- [Bolender et al., 2013](#) Bolender DL, Ettarh R, Jerrett DP, Laherty RF. Curriculum integration = course disintegration: What does this mean for anatomy?. *Anatomical Sciences Education*. 2013;6:205–208.
- [Brauer and Ferguson, 2015](#) Brauer DG, Ferguson KJ. The integrated curriculum in medical education: AMEE Guide No 96. *Medical Teacher*. 2015;37:312–322.
- [Cheung et al., 2019](#) Cheung JJH, Kulasegaram KM, Woods NN, Brydges R. Why content and cognition matter: integrating conceptual knowledge to support simulation-based procedural skills transfer. *Journal of General Internal Medicine*. 2019;34:969–977.
- [Cooke et al., 2010](#) Cooke M, Irby DM, O'Brien BC. *Educating physicians: a call for reform of medical school and residency* Stanford, CA, USA: The Carnegie Foundation for the Advancement of Teaching; 2010.
- [Dominguez and Zumwalt, 2020](#) Dominguez I, Zumwalt AC. Integrating the basic sciences in medical curricula: focus on the basic scientists. *Advances in Physiology Education*. 2020;44:119–123.
- [Donner and Bickley, 1993](#) Donner RS, Bickley H. Problem-based learning in American medical education: an overview. *Bulletin of the Medical Library Association*. 1993;81:294–298.
- [Finnerty et al., 2010](#) Finnerty EP, Chauvin S, Bonaminio G, Andrews M, Carroll RG, Pangaro LN. Flexner revisited: the role and value of the basic sciences in medical education. *Academic Medicine*. 2010;85:349–355.
- [Flexner, 1910](#) Flexner A. *Medical education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching*. New York, NY, USA: The Carnegie Foundation for the Advancement of Teaching; 1910.

- Harden, 2000 Harden RM. The integration ladder: A tool for curriculum planning and evaluation. *Medical Education*. 2000;34:551–557.
- [Harden et al., 1984](#) Harden RM, Sowden S, Dunn WR. Educational strategies in curriculum development: The SPICES model. *Medical Education*. 1984;18:284–297.
- [HHMI-AAMC, 2009](#) HHMI-AAMC. *Scientific foundations for future physicians* Washington, DC, USA: Association of American Medical Colleges; 2009.
- Kulasegaram et al., 2015 Kulasegaram K, Manzone JC, Ku C, Skye A, Wadey V, Woods NN. Cause and effect: Testing a mechanism and method for the cognitive integration of basic science. *Academic Medicine*. 2015;90:S63–S69.
- [Kulasegaram et al., 2013](#) Kulasegaram KM, Martimianakis MA, Mylopoulos M, Whitehead CR, Woods NN. Cognition before curriculum: Rethinking the integration of basic science and clinical learning. *Academic Medicine*. 2013;88:1578–1585.
- [Levine and Hudes, 2013](#) Levine R, Hudes P. “How to” guide for team-based learning Huntington, WV, USA: IAMSE Manual, International Association of Medical Science Educators; 2013.
- [Lisk et al., 2016](#) Lisk K, Agur AMR, Woods NN. Exploring cognitive integration of basic science and its effect on diagnostic reasoning in novices. *Perspectives on Medical Education*. 2016;5:147–153.
- [Loftus, 2015](#) Loftus S. Understanding integration in medical education. *Medical Science Education*. 2015;25:357Z–360.
- [Mylopoulos and Woods, 2014](#) Mylopoulos M, Woods NN. Preparing medical students for future learning using basic science instruction. *Medical Education*. 2014;48:667–673.
- [van der Hoeven et al., 2020](#) van der Hoeven D, Zhu L, Busaidy K, Quock RL, Holland JN, van der Hoeven R. Integration of basic and clinical sciences: student perceptions. *Medical Science Education*. 2020;30:243–252.
- [Wijnen-Meijer et al., 2010](#) Wijnen-Meijer M, ten Cate O, van der Schaaf M, Borleffs JC. Vertical integration in medical school: effect on the transition to postgraduate training. *Medical Education*. 2010;44:272–279.
- [Woods et al., 2007](#) Woods NN, Brooks LR, Norman GR. The role of biomedical knowledge in diagnosis of difficult clinical cases. *Advances in Health Sciences Education*. 2007;12:417–426.
- [Woods et al., 2006](#) Woods NN, Neville AJ, Levinson AJ, Howey EHA,

Oczkowski WJ, Norman GR. The value of basic science in clinical diagnosis. *Academic Medicine*. 2006;81:S124–S127.

Interprofessional Education

Jill E Thistlethwaite and Peter H Vlasses

Trends

- Interprofessional education (IPE) involving healthcare and social care professionals and students is now well established in many countries globally.
- Interprofessional learning outcomes and competencies are being included in an increasing number of licensing and accreditation standards for the health professions.
- Evidence continues to build for the effectiveness of IPE for achieving collaborative practice competencies.

Key concepts

Interprofessional: a strategy in which learners and practitioners learn and work together for a common goal at any stage of education and training. It implies dialogue and negotiation, consensus and compromise, as well as mutual understanding and respect.

Interprofessional education (IPE): when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes ([WHO, 2010](#)).

Interprofessional collaboration: a partnership between a team of health providers and a client in a participatory, collaborative and coordinated approach to shared decision-making around health and social issues.

Interprofessional collaborative practice (IPCP): when multiple health workers from different professional backgrounds work together with patients, families, carers, and communities to deliver the highest quality of care ([WHO, 2010](#)).

Interprofessional competencies: the complex integration of knowledge, skills, attitudes, values and judgements that allow a health provider to apply these components into all collaborative situations. Competencies should guide growth and development throughout one's life and enable one to effectively perform the activities required in a given occupation or function and in various contexts ([CIHC, 2010](#)).

Interprofessional team-based care: care delivered by intentionally created, usually relatively small work groups in healthcare who are recognized by others, as well as by themselves as having a collective identity and shared responsibility for a patient or group of patients (e.g., rapid response team, palliative care team, primary care team and operating room team) ([IPEC, 2016](#), p.8).



Tip

The prepositions 'from', 'with' and 'about' in the definition of IPE are important and necessary as they imply that interprofessional learning should be interactive and equitable.

History and developments

Interprofessional education (IPE) dates back over 60 years. Activities involving diverse health professional students learning together have been described in Australia, the United Kingdom and the United States amongst other countries since the 1960s ([Barr, 2014](#)). The US Institute of Medicine (IOM) first called for IPE in 1972 and has reiterated the need in subsequent reports. A common feature of the early initiatives is the lack of sustainability because of nonrecurrent funding and loss of the interprofessional champion within an institution, highlighting the need for embedding IPE into curricula and academic succession planning. The World Health Organization (WHO) published its influential framework for action, advocating for IPE as part of the global health agenda in 2010 ([WHO, 2010](#)).

Although the majority of peer-reviewed articles in English-language journals are from upper middle to high-income countries, IPE is a global movement. There are interprofessional networks, associations and regular conferences in Brazil, Lebanon, Malaysia, Thailand and sub-Saharan Africa, as well as Japan, the Middle East and India.



"A shared understanding of IPE terminology, learning, and measurement will guide more uniform expectations for the development, implementation and evaluation of quality IPE."

Health Professions Accreditors Collaborative (2019)

Interprofessional education and collaborative practice

Health professional students and newly qualified health professionals need to understand the healthcare system in which they will be or are working. This knowledge should include the complexities of patient pathways through the system and the diverse ways in which healthcare and social care professionals and patients interact. In the 21st century, healthcare and social care delivery is necessarily a collaborative process as medical knowledge increases, practitioners specialize in narrower fields and patients move between primary, secondary and tertiary care sectors. In addition, the population is ageing and there is a higher prevalence of chronic and complex conditions. Social determinants of health (e.g., poverty and access to care) can have great bearing on health outcomes and must also be considered by healthcare teams. It is rare that one professional can meet the needs and expectations of each patient, family and community.

Whereas the WHO has defined interprofessional collaborative practice in broad terms (see glossary), in action in different settings and jurisdictions, it takes many forms from bounded small teams to much looser alliances. Classification and understanding of the diversity of interprofessional working is important so that IPE may relate to the real world of practice and prepare learners for their roles and responsibilities, as well as enabling research into the impact of both IPE and IPCP. [Xyrichis et al. \(2018\)](#) have proposed a typology that has four levels and five subcategories: teamwork; collaboration (consultative collaboration, collaborative partnership); coordination (coordinated collaboration, delegative coordination, consultative coordination); and networking.



"Unless there is greater clarity in the field about the different kinds of interprofessional work, progress in identifying which works better and under what circumstances will continue to be slow and unreliable."

[Xyrichis et al. \(2018\)](#)

Evidence for the effectiveness of interprofessional education

IPE is designed to help health professionals collaborate with the aim of improving patient care. It is difficult to show that any education at a prequalification level affects patient care and safety, but it is important to evaluate IPE to demonstrate not only that it meets the learning needs for team-based and collaborative practice but also what aspects work and for whom. Several syntheses of systematic reviews are available including one that analyses eight reviews with from 10 to 133 studies per review. This synthesis concluded that IPE is able to nurture knowledge, skills and attitudes for collaborative practice; in addition, there is growing but still limited evidence that IPE can lead to improved patient care through enhancing collaborative practice ([Reeves et al., 2017](#)).

It can be difficult to draw generalizable inferences about the key elements of IPCP and its effectiveness because of the limitations in terms of the small number of studies, sample sizes, problems with conceptualizing and measuring collaboration and heterogeneity of interventions and settings. After determining that no models sufficiently incorporate all of the necessary components to guide future research on the impact of IPE on collaborative practice and patient outcomes, the IOM developed an interprofessional learning continuum model (IPLC) ([Fig. 18.1](#)) that has four interrelated components: a learning continuum including formal and informal activities; the outcomes of learning that encompass individual, population health outcomes and system outcomes; and factors that influence implementation and these outcomes ([IOM, 2015](#)).

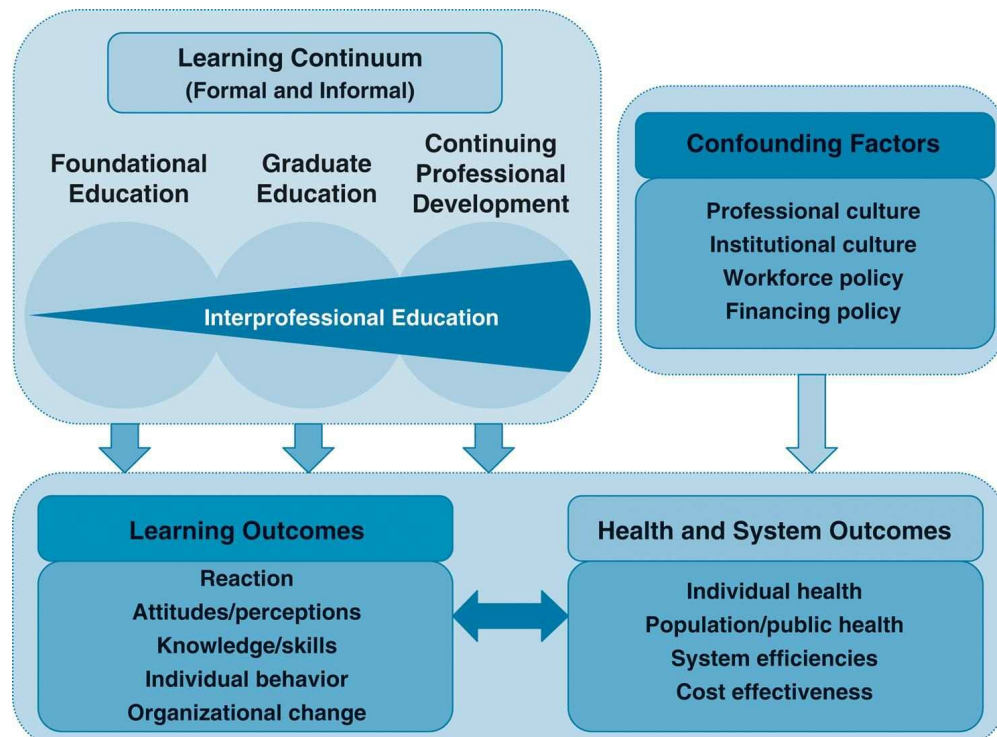


FIGURE 18.1 The interprofessional learning continuum model. (From Institute of Medicine. 2015. Reprinted with permission from the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.)



“... successful application of the IPLC model is dependent on how well the interdependent education and healthcare systems are aligned.”

Institute of Medicine (2015)



Tip

When planning interprofessional activities remember to build in an evaluation and/or research plan and consider whether ethical approval is required if there is an intention to disseminate the results.



The reason for evaluation is to: “provide accountability for healthcare and social care resources to those who provide or control them – regional/national authorities, research and service funders, consumers and foundations.”

Reeves et al. (2013)

Theories underpinning interprofessional education and interprofessional collaborative practice

A criticism of IPE and IPCP has been that they are atheoretical constructs. However, a growing body of work is focussing on selecting and using theory to underpin scholarly work and practical developments in IPE and IPCP. [Hean et al. \(2012\)](#) have provided a useful guide to learning theories applicable to IPE, including sociocultural theory that emphasizes the social aspect of learning. Interprofessional learning is through the active engagement of learners with the roles, beliefs, values and culture of other professionals with the aim of achieving shared learning and shared goals. IPCP draws on theories from sociology, psychology and other fields, with frequently cited examples being activity theory, social identity theory, and communities of practice.

Curriculum development

Although we acknowledge that the logistics of developing and delivering effective IPE can be complex, we also recognize that difficulties are frequently put forward as a reason for stifling innovation and because of professional hierarchies. Successful curriculum development involves an interprofessional approach: harnessing the enthusiasm and motivation of educators and clinicians across faculties, schools, disciplines and clinical locations. Institutional leadership and commitment are important to drive and sustain change; practical examples of these are included in [Table 18.1](#).

Table 18.1 Examples of institutional approaches for leadership and commitment

- Definition and dissemination of strategic direction and approach from academic, clinical and institutional leaders
- Commitment of sustained resources for IPE, such as staff, space and budget
- Provision of protected time to faculty for development and delivery of IPE
- Development of dedicated unit for IPE
- Ongoing faculty development for IPE
- Recognition of best practice in IPE for promotion and awards

IPE, Interprofessional education.

(Modified from [Health Professions Accreditors Collaborative. \(2019\)](#). Guidance on developing quality interprofessional education for the health professions. Chicago, IL: Health Professions Accreditors Collaborative.)

A useful model for planning an interprofessional curricular approach is the four-dimensional (4D) framework ([Lee et al., 2013](#)) ([Table 18.2](#)).

Table 18.2 The four-dimensional curriculum development framework for interprofessional education

| Dimension | Description |
|---|--|
| 1. Identifying future healthcare needs | Curriculum takes into account global health and education reforms, and local needs |
| 2. Defining and understanding competencies for practice | The desired outcomes of IPE for changing health service delivery; expertise required |
| 3. Teaching, learning and assessment | Appropriate methods and activities to align with dimensions 1 and 2 |
| 4. Supporting institution delivery | Takes into account local institutional logistics that shape curriculum design |

IPE, Interprofessional education.

(Modified from [Lee et al., 2013](#).)

The first dimension is identifying future healthcare practice needs and using these as the rationale for change, based on global health imperatives, educational reforms and theories, as well as local conditions and accreditation body requirements.

Learning outcomes and accreditation

Once the planning team is identified, dimension 2 involves understanding and defining the competencies or learning outcomes required for interprofessional practice by all learners within their institution or setting. These should align with the professional accreditation standards set for prequalification or postqualification continuing professional development (CPD) programmes. Typically, national health professional accreditation bodies, while including interprofessional learning outcomes in their requirements, tend to write these with different emphases and wording, making it difficult for institutions to reach consensus on a set of outcomes for all professions. In some countries, accrediting bodies have collaborated to agree on interprofessional competencies, such as Canada (<https://casn.ca/wp-content/uploads/2014/12/AIPHEPrinciplesandPracticesGuidev2EN.pdf>), which is in the process of applying the standards in accreditation reviews. In the United States, 24 accreditors in the Health Professions Accreditors Collaborative (HPAC) have endorsed a guidance document for health programmes on implementing quality IPE. (<https://healthprofessionsaccreditors.org/ipe-guidance/>). The most frequently defined learning outcomes or competencies fall into six main areas: teamwork; communication; understanding of roles and responsibilities; ethical issues; the patient; and learning/reflection. Under these headings, it is important to include specific outcomes focusing on recognition of conflict and negotiation skills, and professional identity formation.



“Accreditors occupy a unique position, working within and across professions and healthcare delivery settings to promote interprofessional collaboration in education and care.”

Cox et al. (2017)

For dimension 3, appropriate and relevant learning activities, as well as assessments, need to be aligned with outcomes or competencies. The feasibility of such activities is dependent on careful consideration being given to: the number of learners and their professions; which activities are mandatory and which elective; the timing (early, late or throughout the course); the number of hours; location (e.g., classroom, clinic, ward, simulation laboratory); the type and timing of assessments; facilitators and their training; timetable coordination; and budget.



Tip

Two comprehensive competency frameworks for IPE include: IPEC (the

Interprofessional Education Collaborative IPEC, 2016) and the CIHC (the Canadian Interprofessional Health Collaborative CIHC, 2010).



“The hallmark of IPE is the type of cognitive and behavioural change that occurs when participants understand and are familiar with the basic language and mindsets of various disciplines.”

WHO (2013)

Learning activities

Dimension 3 focuses on delivery: learning and teaching activities, and assessment. The common curriculum model involves students from different healthcare and social care professions spending one or more weeks learning together full-time on a defined topic. For this to be interprofessional, the learning should be interactive and not didactic: the interprofessional learning activities need to be explicit. The WHO has identified four principles that are important in the design of interprofessional curricula: relevance to learners' current or future practice; incorporating typical and priority health issues that are solved through interprofessional approaches; IPL based on clinical practice; and interactive learning methods such as small group and case-based learning (WHO, 2013). Online IPL is possible and for large numbers of learners, but it must be able to facilitate interaction and online discussions. The interprofessional spiral curriculum exposes students to IPE at an early stage with subsequent immersion in clinical and simulation experiences in the later years. All health professional students undertake clinical rotations; by mapping such attachments, it should be possible to bring students together to provide team-based and/or collaborative experiences that are as authentic as possible. In addition, it may be possible to develop training wards based on the Swedish model, longitudinal integrated clerkships that have interprofessional opportunities and student-run interprofessional clinics. Online collaborative learning activities, completed synchronously or asynchronously where students from one programme learn with students from another programme or with practitioners representing different professions from their own, are being used in IPE. Examples are videoconference discussions, mock electronic medical record collaborations, interprofessional gaming, chat room discussions and simulations.

Adult learning theory recommends that learning experiences should be relevant to the learner. Thus students should have the opportunity to engage in authentic clinical and team-based tasks. A major issue, however, is that of the hidden curriculum: what students learn from observation, institutional cultures and role models. Some students may not observe interprofessional teamwork in action during their clinical placements, because such teamwork is not explicit, does not look like the models they have learnt about, or does not exist. Interprofessional coordination and networking, for example, may not be apparent to students. This lack of experience may lead some to question the very nature of interprofessionalism and IPE. After any interprofessional activity, students need to be debriefed about what they have seen and learnt, be given time to discuss the type or lack of teamwork they have observed and be encouraged to consider how teamwork and collaborative practice may be fostered in the environments in which they have been placed.



Tip

Educators need to ensure that students are exposed to interprofessional practice during their programmes; they may attend multidisciplinary team meetings in hospital or primary care, work within operating theatres, be attached to well-functioning clinics or be supported in student-run clinics.

Assessment



“Assessment of interprofessional learning outcomes should, as a minimum, include candidate-completed conventional assessments of role understanding; and observational assessment of individuals interacting interprofessionally, either in simulated or real patient and client care setting.”

Rogers et al. (2017)

When educators define competencies that should be achieved, they also need to develop robust and feasible assessment methods to measure those competencies (Rogers et al., 2017). The assessment of teamwork may be a challenge as it should be undertaken during observation of learners working in teams and carrying out teamwork tasks, either during simulation or in clinical and professional settings. Assessment may involve such team-based activities as projects and presentations, simulations involving multiple professionals, team-based objective structured clinical examination (T-OSCE) stations, the preparation of patient care plans, handover or referral pathways. Educators need to decide whether the task is a collective responsibility, with all students in a team receiving the same mark, or whether individuals are assessed on individual team performance, perhaps involving peer marking. However, as students may work infrequently in defined interprofessional teams, observation of their teamwork as a work-based assessment may be difficult. A team may be formed specifically for the purpose of assessment, for example, for a simulation or T-OSCE. This type of ‘teamwork’ is similar to clinical tasks, such as the response to a cardiac arrest with a team forming in response to an incident, however clinical teams or collaborations in other settings take time to form and gel and thus to perform optimally.

Other considerations include timing; weighting of any summative assessment in terms of whether it is graded, or pass/fail only; which professions are involved and at what stage of their curriculum; whether assessors need to be the same profession of each learner; what type of faculty development is required to observe, give feedback and assess; and the impact of the assessment on the learners.

Summative is more problematic than formative assessment, as professional accreditation or licensing bodies usually have different requirements in terms of grading and types of examinations and typically insist that students are assessed by members of the same profession. Portfolios, with reflective components and with students’ collected evidence of achieving outcomes, are a useful option but there may be issues relating to reliability and feasibility. Multisource feedback (MSF) forms may also be included, with students asking for feedback on performance from a number of different health professionals and patient with whom they come into contact. MSF is also a valuable method for assessment of postqualification clinicians.

Postqualification

CPD has traditionally been focused at the level of the individual healthcare practitioner. IPL may be formal, informal or serendipitous (unplanned).

More recently, the value of CPD involving health practitioner teams learning together and focusing jointly on quality and safety gaps in healthcare has been identified as a strategic resource. For example, in the United States, a unique accreditation model has been developed to incentivize and facilitate team-based continuing professional development across nine health professions (medicine, nursing, pharmacy, optometry, physician assistants, social work, psychology, dentistry and dietitians) (<http://jointaccreditation.org/>).



“Serendipitous interprofessional learning often happens in daily practice when members of different professions review their work together, or encounter something unusual, causing them to pause, more closely observe some aspect of overlapping concern, or seek information from one another. It is axiomatic that we cannot plan serendipitous learning.”

Freeth et al. (2018)



Joint Accreditation for Continuing Interprofessional Education™

“To improve patient care, safety, and quality, we need to build a collaborative learning culture that nurtures interprofessional teams. I encourage health system leaders to recognize the value of education planned by and for the healthcare team and to think about how they can leverage the power of IPCE to support their community of clinicians and patients.” Graham McMahon, MD, MMSc, President and CEO, Accreditation Council for Continuing Medical Education (ACCME®) 2017 (<https://www.jointaccreditation.org/new-credit-recognizes-interprofessional-continuing-education-healthcare-teams>)

Faculty development for interprofessional education

Faculty members in the health professions who have been trained and practice in a more traditional siloed model of care need targeted IPE faculty development to be effective educators in team-based and collaborative models of care. The attributes required for optimal interprofessional facilitations, drawn from a number of sources, are listed in Table 18.3. The University of Toronto has developed excellent resources to support faculty IPE development (<http://www.ipe.utoronto.ca/continuing-professional-development>).

Table 18.3 The attributes of an effective interprofessional facilitator

- | |
|---|
| <ul style="list-style-type: none">• Competencies relating to teamwork theory and team building• Experience of working in a healthcare team—ideally interprofessional rather than multiprofessional• Experience of collaborative practice and the ability to promote this within the workplace• Knowledge of others’ professional roles and responsibilities• Awareness of boundary issues and the issues regarding blurring of professional roles• An understanding of the process of professional socialization and how this might impact on interprofessional interactions• Skills in negotiation and conflict resolution• Knowledge of the evidence for interprofessional education |
|---|

Overcoming challenges

Over the years, there have been many challenges and barriers to the development of effective IPE and IPCP. These factors include:

- Resistance to change (Where's the evidence?)
- Lack of leadership (administrative and faculty)
- Crowded curricula
- Cost factors and few incentives
- Separation of professional programmes within a campus and across universities
- Lack of accreditation expectations
- Treating IPE as an 'add on' rather than a change in curricular philosophy

Supporting institutional delivery is the final dimension of the 4D framework. In organizations where these challenges have or are being overcome, some common factors are observed, such as commitment of the university and health system leadership to IPE and IPCP; motivated champions; collaborative interprofessional curriculum development and oversight; and adequate resources. In addition, we advocate for recognition of interprofessional teaching, scholarship and research in faculty promotion and tenure guidelines with incentives to undertake faculty development to enhance interprofessional leadership.

Summary

The changing nature of modern healthcare and social care delivery, with an increasing emphasis on collaboration between practitioners, is the stimulus for greater awareness and development of IPE. There is growing evidence for the effectiveness of learning and working together. It is important that interprofessional learning outcomes are explicit and align with activities and assessment. Postqualification learning is best carried out in established teams for relevance. Faculty development is crucial for success. As further research is needed in this field, rigorous evaluation should be planned for and research questions considered. Successful IPE is challenging but also rewarding, and helps us share values and experience with other colleagues.

References

- Barr, 2014 Barr H. Leading the way. In: Forman D, Jones M, Thistlethwaite JE, eds. *Leadership development for interprofessional education and collaborative practice*. Basingstoke: Palgrave; 2014;15–25.
- Canadian Interprofessional Health Collaborative (CIHC), 2010 Canadian Interprofessional Health Collaborative (CIHC): *A national interprofessional competency framework*, 2010. Available at: http://www.cihc.ca/files/CIHC_IPCompetencies_Feb1210.pdf.
- Cox et al., 2017 Cox M, Blouin AS, Cuff P, Paniagua M, Phillips S, Vlasses PH. *The role of accreditation in achieving the quadruple aim for health*. NAM Perspectives Washington, DC: National Academy of Medicine; 2017.
- Freeth et al., 2018 Freeth D, Savin-Baden M, Thistlethwaite JE. Interprofessional education. In: Swanwick T, O'Brien B, Forrest K, eds. *Understanding medical education*. 3rd edition Oxford: Wiley; 2018;191–206.
- Health Professions Accreditors Collaborative (HPAC) Health Professions Accreditors Collaborative (HPAC). Available at: <https://healthprofessionsaccreditors.org/>.
- Health Professions Accreditors Collaborative, 2019 Health Professions Accreditors Collaborative. *Guidance on developing quality interprofessional education for the health professions* Chicago, IL: Health Professions Accreditors Collaborative; 2019.
- Hean et al., 2012 Hean S, Craddock D, Hammick M. Theoretical insights into interprofessional education AMEE Guide No. 62. *Medical Teacher*. 2012;34:e78–e101.
- Interprofessional Education Collaborative (IPEC), 2016 Interprofessional Education Collaborative (IPEC). *Core competencies for interprofessional collaborative practice: 2016 update*. 15 Washington, DC: Interprofessional Education Collaborative; 2016.
- Institute of Medicine (IOM), 2015 Institute of Medicine (IOM). *Measuring the impact of interprofessional education on collaborative practice and patient outcomes* Washington, DC: The National Academies Press; 2015.
- Lee et al., 2013 Lee A, Steketee C, Rogers G, Moran M. Towards a theoretical framework for curriculum development in health professional education. *Focus on Health Professional Education*.

2013;14(3):70–83.

Reeves et al., 2013 Reeves S, Lewin S, Espin S, Zwarenstein M. *Interprofessional teamwork for health and social care* Oxford: Blackwell Publishing; 2013.

Reeves et al., 2017 Reeves S, Palaganas J, Zierler B. An updated synthesis of review evidence of interprofessional education. *Journal of Allied Health*. 2017;46(1):56–61.

Rogers et al., 2017 Rogers GD, Thistlethwaite JE, Anderson ES, et al. International consensus statement on the assessment of interprofessional learning outcomes. *Medical Teacher*. 2017;39:347–359.

World Health Organization (WHO), 2013 World Health Organization (WHO). *Transforming and scaling up health professionals education and training* Geneva: WHO; 2013.

World Health Organization (WHO), 2010 World Health Organization (WHO): *Framework for Action on Interprofessional Education and Collaborative Practice*, Geneva: WHO, 2010.

Xyrichis et al., 2018 Xyrichis A, Reeves S, Zwarenstein M. Examining the nature of interprofessional practice: an initial framework validation and creation of the InterProfessional Activity Classification Tool (InterPACT). *Journal of Interprofessional Care*. 2018;32:416–425.

Problem-Based Learning

Diana Dolmans, Woei Hung and Janneke M Frambach

Trends

- Problem-based learning (PBL) belongs to a family of related student-centred, task-centred/problem-driven instructional approaches to learning. The boundaries between and within different approaches in this family are blurry.
- There is no one size fits all PBL approach; PBL can take many shapes to address context specific needs, resources, values and beliefs.
- PBL approaches often align with principles of contextual, constructive, collaborative and self-directed learning.
- PBL in practice is a matter of continuously rethinking, reinventing and revitalizing the approach locally based on theories, stakeholders' perspectives and institutional, social, cultural and other contextual differences.

Key concepts

- Contextual learning: organizing learning around complex, ill-defined problems, tasks, or projects, derived from a professionally relevant context to stimulate transfer of learning to similar and new situations. This is also often called task-centred or problem-driven learning.
- Constructive learning: encouraging students to actively construct and reconstruct their mental models about the domain by stimulating students to activate their prior knowledge, to generate meaningful relations between the students' prior knowledge and new knowledge, and asking students to self-explain, to ask and answer critical questions, and to discuss cognitive disagreements.
- Collaborative learning: students learn from and with each other, to co-construct knowledge and infer new knowledge, when discussing complex problems. Collaborative learning is beneficial for learning when students learn in the context of complex problems or projects in which they have to build upon each other's ideas through open dialogues.
- Self-directed learning: encouraging students to take the lead in determining their own learning needs, setting goals and strategies to achieve goals and evaluating their learning, from a cognitive, but also emotional and motivational perspective. Students can be facilitated to become self-directed learners by for example stimulating them to generate questions or define learning issues that need further study and select relevant sources to study.

Introduction

Many institutions across the world have adopted problem-based learning (PBL) approaches in their medical and health sciences programmes. Accreditation bodies in some countries even recommend PBL as a golden standard. Although PBL has been adopted and applied worldwide among various institutions and varied disciplines, there is criticism. This is often worded as follows: *“We still call our program PBL, but it is not true PBL”, “We tried the seven-jump PBL approach, but it did not work in our school”, “PBL sounds nice in theory, but in practice it is demanding and challenging”, “PBL sounds old fashioned; PBL is not innovative.”* PBL is being replaced or modified into other approaches, even by world leading PBL institutions. This sounds like a paradox.

In this chapter, we aim to move beyond this paradox by approaching PBL as a family of related student-centred, task-driven or problem-driven instructional approaches to learning. We first explain the underlying philosophy of this family, which is related to the paradigm of constructivism. Then, we explain a number of theoretical principles underlying many PBL approaches, that is the principles of contextual learning, constructive learning, collaborative learning, and self-directed learning. Next, we discuss a variety of ways in which these principles can be applied, focusing on the level of techniques. We first explain techniques that have often been used from a traditional perspective on PBL, after which we turn to variations and modifications of PBL techniques. PBL techniques are continuously being redesigned and adapted worldwide leading to different shapes of PBL in practice. We subsequently discuss important aspects to consider when aligning PBL with context-specific needs, resources, values and beliefs. Finally, we reflect on the implications of seeing PBL as a family of related approaches.

We argue that there is no ‘true’ one-size-fits-all PBL approach. There are different views on PBL; there is no consensus on its techniques, and even its principles and philosophy are debated. PBL can and should take many shapes to address contextual needs and circumstances. The ‘label’ (e.g., PBL or a different one) is not the most important thing; what matters are theoretical learning principles and their underlying philosophy, whereas their translation to techniques is not straightforward. Education is a matter of continuously rethinking, reinventing and revitalizing the approach based on theoretical principles, stakeholders’ perspectives, and institutional, social, cultural and other contextual differences. In the following, we will use the term PBL as an overarching term to collectively refer to the varied approaches within the PBL family.

As authors, our backgrounds have shaped this work. We come from different disciplines and have different experiences with and perspectives on PBL. DD is an educational scientist and has researched PBL in medical education over many years from a cognitive and social perspective. WH is a learning scientist and has a background in instructional design. He has studied PBL in various disciplines and all education levels for many years. JF has an interdisciplinary background in the social sciences and humanities and has researched PBL in medical education from international, cross-cultural and critical perspectives. We hope that the combination of

our perspectives benefits the strength and global applicability of the chapter, yet we acknowledge that our way of viewing PBL is the result of our contextual experiences.

Problem-based learning: philosophy, principles and techniques

Underlying philosophy of problem-based learning

When describing or analysing an educational intervention, we can take a look at its underlying techniques, principles and philosophy, following Cianciolo and Regehr's framework of layered analysis (Table 19.1). The philosophy can be defined as the underlying paradigm, worldview or identity of an intervention (Cianciolo & Regehr, 2019). PBL's underlying philosophy or identity is often related to the paradigm of constructivism, that is the idea that knowledge is constructed by and between people, gained through dialogue and interactions with others, as opposed to ideas that there is only one truth and that knowledge is absolute and generalizable (positivism). Within the constructivist paradigm, the underlying philosophy of PBL has been heavily debated; PBL was either considered as an approach that is aimed at acquiring clinical problem-solving skills or as an approach to apply knowledge. Nowadays, in the literature, there seems to be consensus about the philosophy of PBL in health professions education: PBL is a student-centred constructivist pedagogy (Schmidt et al., 2019), and is generally identified as a broad family of approaches using problems as a basis for learning to apply knowledge, and not for learning to solve problems (Neville et al., 2019). In practice, however, the term 'problem-solving' is still widely used in relation to PBL.

Table 19.1 Layered analysis: problem-based learning, its philosophy, principles and techniques

| Level of analyzing a curriculum intervention ^a | General description of proposed level | Examples on how to concretize each proposed level for a problem-based learning approach | Influence of context in which intervention is implemented |
|---|--|---|---|
| Philosophy | Underlying paradigm or worldview | Constructivism: knowledge is constructed by and between people through dialogue | Context plays a minor or limited role. Paradigms offer limited guidance. |
| Principles | Theories, learning principles, instructional design principles | Contextual learning; constructive learning; self-directed learning; collaborative learning; and others | Context plays a role. Principles offer rough guidance. |
| Techniques | How the intervention is structured and implemented in daily practice | Problem format; group size; role of tutor; number of lectures; alignment between learning activities and assessment | Context plays a major role. The translation of principles to practice is context-dependent. |

^aCianciolo, A.T., Regehr, G. (2019). Learning theory and educational intervention: producing meaningful evidence of impact through layered analysis. *Academic Medicine*, 94(6), 789–794.



"PBL is generally identified as a family of student-centred approaches using problems to learn to apply knowledge."

Theoretical principles of problem-based learning

One can also look at an intervention, in this case PBL, from the level of principles. Principles can be considered theories underlying the intended intervention. Theories or principles that generally fit with PBL and its underlying philosophy are contextual learning, constructive learning, collaborative learning and self-directed learning.

The first principle, contextual learning, refers to organizing learning around complex, ill-defined problems, tasks or projects, derived from a professionally relevant context to stimulate transfer of learning to similar and new situations. By using ill-structured, real life, authentic problems, the knowledge and skills students learn are connected with applicable situations and profession-relevant environments, and therefore may be meaningful and useable for students. These tasks, problems or projects can be ordered from simple to complex to enable the learner to construct an integrated set of knowledge, skills and attitudes.

This relates to the second principle, constructive learning, which strongly relates to the notion of placing the student at the centre of learning. Constructive learning means that students are encouraged to actively construct and reconstruct their mental models about the domain. This can be done by stimulating students to activate their prior knowledge, to generate meaningful relations between the students' prior knowledge and new knowledge, and asking students to self-explain, to ask and answer critical questions, and to discuss cognitive disagreements.

The third principle, collaborative learning, implies that students learn from and with each other, to co-construct knowledge, when discussing complex problems. Collaborative learning is beneficial for learning when students learn in the context of complex problems in which they have to build upon each other's ideas through open dialogues. With diverse backgrounds, prior knowledge and skills among group members, students can benefit from multiple perspectives brought by their group members. In addition to these cognitive benefits, there might be benefits from a social perspective, for example, when students work collaboratively towards a common goal, it might make them feel socially related, which can enhance their intrinsic motivation.

The fourth principle, self-directed learning, also closely relates to the idea of placing the student at the centre. Self-directed learning means encouraging students to take the lead in determining their learning goals, strategies to achieve these goals and evaluating their learning. Students can be facilitated to become self-directed learners by, for example, stimulating them to generate questions or define learning issues that need further study and select relevant sources to study. This does not imply that students do not need any scaffolds or support during their self-directed learning. Students need considerable support, for example, to determine their cognitive learning needs, as well as emotional and motivational support. Teachers or tutors play an important role as both content experts and facilitators of learning (Hmelo-Silver et al., 2019). Tutors may

encourage students to apply the knowledge to the problem that is being discussed and to related problems, model reasoning processes, give explanations or encourage students to give explanations in their own words, offer hints for resources to be consulted, and provide feedback and raise questions. In other words, tutors can provide support and scaffolds to encourage students to become self-directed learners. Encouraging self-directed learning is about finding the optimal balance between student initiated and teacher-initiated interactions, between enhancing self-directed learning and providing scaffolds, as well as smoothly adapted to the students' metacognitive, cognitive, emotional and motivational needs. These four general principles or theories, which we only briefly summarize here, have been described in the literature as important principles underlying PBL ([Dolmans, 2019](#)).

Techniques of problem-based learning

Finally, one can look at interventions from the level of techniques ([Cianciolo & Regehr, 2019](#)). Techniques are at the surface of an intervention. In PBL, this can for example be considered the problem format, the group size and the role of the tutor. The context in which an intervention is applied significantly influences the way in which techniques and learning principles are modified. Techniques in particular are highly sensitive to local or contextual differences ([Cianciolo & Regehr, 2019](#)). In the next section, we focus on the level of techniques, first in the context of what we call a traditional perspective on PBL, and then in the context of the broader family of PBL approaches.

A traditional perspective on problem-based learning

PBL literature often describes three key components: a problem, group learning and a facilitator. Later, we present an example of how these components may be translated as techniques of PBL, based on how they have often been described in the literature, in the context of what might be called ‘traditional PBL approaches’.

Problem

A problem or scenario that contains key information, for example, about a patient case, such as symptoms, vital signs, age of a patient, is presented to the students. In medical education, problem scenarios have typically been a description of a set of phenomena that need to be explained. The problem presentation could be in text or multimedia format. This problem scenario serves as a starting point for learning and provides a meaningful context for a particular topic and a number of learning issues. The quality of problems is critical as they are what drive the learning in PBL.

Group learning

After receiving the problem, the students work in small groups to investigate the problem. They discuss and identify what the knowns and unknowns are by activating their relevant prior knowledge, generate hypotheses for the cause(s) of the problem or symptoms, and generate learning issues. After the group discussion session, the students research the learning issues generated in the group session during self-study time. The group then reconvenes after some days and synthesizes their findings with other group members. The process could comprise one or multiple sessions in the duration of a week.

Facilitators

Tutors facilitate the students’ learning throughout the PBL process ([Hmelo-Silver et al., 2019](#)). The tutor monitors the learning of the students carefully, intervenes when necessary by promoting them with guiding questions, modelling reasoning, or directing the group dynamics towards positive directions. The tutor often has both context expertise on the topic being discussed and expertise on how to facilitate the group process. In addition to the discussion in the group, lectures and skills trainings are offered to complement what is being discussed in the group related to the problem that is being discussed. The portion of group learning and lectures or trainings offered depends on the PBL model used.

Different shapes of problem-based learning

Whereas PBL from a traditional perspective is considered to start from a problem scenario in a certain format, which is being discussed in a small group under guidance of a tutor, many institutions have transformed their PBL towards more varied approaches. For example, problem scenarios are offered in the form of projects, real-life tasks, or interactive short video clips in which students are challenged to answer questions and discuss contradictions. The same holds for the group work. Although initially students in PBL were often described to meet in a group of 6 to 10 students, we nowadays see students work in smaller teams of 3 to 4 students, in larger groups of 15 to 20 students, in smaller project-based groups, or in a mix of teams and larger groups (Dolmans et al., 2015). We also see students meet in groups only once in 2 to 3 weeks or even daily dependent on the project work to be done. The roles of tutors also vary. We see tutors who facilitate the group with their content expertise, but we also see groups where the tutor is not available to every team or in group meetings but can be called or invited when needed dependent on the students' needs (Fonteijn & Dolmans, 2019).

Project-based learning, case-based learning and team-based learning

Over half of a century, PBL has evolved from an educational method that often prescribed a specific structure into an educational philosophy under which many variations spawned; some with their own labels, such as project-based learning (PjBL), case-based learning (CBL), and team-based learning (TBL). PjBL is an instructional approach that focuses not only on problem analysis and knowledge application but also on problem solving, commonly used in engineering fields. Producing a final product or solution for addressing the problem plays an important role and it often consists of phases, such as problem analysis, and generating, evaluating and reporting a solution. Sharing the principle of using authentic problems to drive the learning, CBL is another instructional approach in the PBL family. It is designed for students to identify theories and principles manifested in the real-life cases discussed (e.g., medicine, law or business). Students in CBL start with problems and have to prepare in advance. Students in CBL are stimulated to be actively engaged, often work in groups, and are offered structure and guidance by experts. Lastly, TBL also starts from relevant problems, prework and teamwork. The prework requires students to study the learning materials before class. The teamwork starts with readiness assurance tests to measure students' knowledge and identify their knowledge gaps. Students thereafter work in small teams to discuss problems, followed by instructor's clarification of the students' questions or misconceptions. Then students will apply the concepts to solve related problems. One teacher in TBL may run 20 or even more study teams. For details about TBL, please see [Chapter 20](#). In varying degrees and expressions, contextual, constructive, collaborative and self-directed learning are underlying the variations discussed earlier. Similarly, these principles underlie countless other variations within

the PBL family that do not carry their own label.



“Many institutions have transformed their PBL towards more varied approaches to address context specific needs.”

Key considerations in the contextualization and implementation of problem-based learning

The development of variations in PBL approaches stems from a need to continuously improve educational practices and to adapt to unique implementation contexts (Hung et al., 2019). Implementing a form of PBL is a matter of contextualizing or localizing; that is keeping into account the sociocultural and institutional context and the available resources. Several key aspects are important to consider when aiming to successfully align a PBL approach with a specific implementation context (Table 19.2).

Table 19.2 Key questions to consider when contextualizing and implementing a problem-based learning approach

Who are your staff?

Who are your students?

Who are your community members?

Who are your collaborating institutions?

Who are your leaders?

Which resources and infrastructure are available?

A first important set of questions is: Who are your staff? What are their experiences and expertise regarding educational approaches? What are their thoughts about teaching in general and PBL in specific? What are their sociocultural norms and values? How many staff are available? Literature on implementing PBL (e.g., Azer, 2011; Giva & Duma, 2015) identifies human resources as a critical factor for success, and emphasizes the importance of developing trust, ownership and motivation among staff by involving them early in the process, soliciting their feedback on the implementation plans, and investing in staff development.

A second set of questions is: Who are your students? What are their educational and sociocultural backgrounds? What did their previous education, for example, in secondary school, look like, and to what extent does this differ from your PBL approach? Elements such as group discussion processes and assessment processes in PBL can be adapted to students' sociocultural backgrounds and expectations (Bestetti et al., 2014). Furthermore, preparing students for a PBL environment and supporting them along the way is another critical success factor identified in PBL implementation processes.

A third set of questions is: Who are your community members? What are the needs of

your communities in terms of graduates' profiles? The need for shifting to PBL approaches can result from community needs, for example, when community members are unsatisfied about the quality or competencies of graduates. Soliciting community members' views may provide valuable input for the contextualization of PBL approaches.

A fourth question is: Who are your collaborating institutions at a national and international level? Literature on PBL implementation generally advises to look for institutions which can provide educational expertise or resources. A related question then is: What is your own educational expertise? What are your ideas about PBL and your experiences of implementing PBL approaches? It is important to look beyond the 'usual' PBL experts or institutions, that is world leading PBL institutions, who may provide relevant expertise but who may also propagate a certain type of PBL approach that might not optimally fit the context ([Frambach et al., 2019](#)). It is important to not only look for collaborators who can share theoretical knowledge and expertise of PBL approaches, but also for collaborators who know the context or put effort in knowing the context and can share expertise and experiences of implementing PBL in a context with specific institutional, social or cultural values.

This relates to a fifth set of questions: Who are your leaders at the institutional and national level? What is the political context of the PBL implementation? Some literature points to social, political and economic pressures regarding PBL implementation ([Frambach et al., 2019](#)). Is the implementation the result of a national decision to implement PBL in all medical schools? Is it the result of funding requirements that prescribe PBL implementation? Is it the result of a well-balanced top-down and bottom-up approach in which leaders have a clear vision and, simultaneously, are open to various stakeholders' opinions? Is it the result of a decision of institutional leaders who wish to keep up with international rankings? These scenarios impact how PBL approaches will be perceived and shaped by staff and students. Some scenarios can result in suboptimal implementation and contextualization. Strong commitment from institutional leaders, a clear vision, and a supportive institutional culture have regularly been identified in the literature as critical factors for successful implementation of a PBL approach.

A final key question is: Which resources and infrastructure are available? Many PBL schools, for example, have rooms available for small group work, labs where students can practice their skills, and libraries where students can search for sources. Many may also have medical education units that organize staff development programmes, quality assurance procedures and assessment procedures. Planning, organizing and maintaining PBL curricula takes great and continuous effort, including alignment with assessment practices. There are very large differences in the available infrastructure and resources among PBL schools. PBL approaches can be tailored to the available resources, for example, by facilitating small group discussions and interactivity in the context of a large group session led by one staff member. When contextualizing PBL approaches, the underlying philosophy, the theoretical learning principles, and the local answers to the earlier key questions provide essential guidance to develop PBL techniques. A few examples may include the decision to introduce the new approach

slowly and gradually, or they may lead to an even more out-of-the-box approach than initially planned.

Reflection on problem-based learning as a family of related approaches

In this chapter, we explain that different techniques might be used within different PBL settings to address context-specific needs that still might be aligned with the principles of contextual, constructive, collaborative and self-directed learning and the underlying philosophy that PBL is an approach to stimulate students to apply knowledge or construct meaning through dialogue and interactions with others. No consensus or standards are agreed upon as to how PBL should be implemented at the level of techniques, because every implementation is unique because of its learner population, nature of discipline, level of study, sociocultural norms, and institutional resources (Wijnia et al., 2019). As Neville et al. (2019) pointed out “there is no one ‘right’ way to do PBL”, or a one-size-fits-all PBL approach.

PBL represents a family of approaches that are and need to be contextualized or localized at the level of the techniques being used, as well as possibly at the level of principles being followed. The four principles described earlier fit well within the family of PBL approaches, but they are not an exhaustive list of theories and principles that may fit well in this family too, nor are they exclusive to the PBL family. The boundaries between different approaches within this family are blurry, as well as the boundaries between this family and the wider family of student-centred approaches. Hence it has proven difficult to define what PBL is and where its boundaries lie. In this chapter, our purpose is not to settle on a restrictive definition of PBL, but rather to discuss how approaches from the PBL family might be used in and useful for health professions education. We note that it is not our intention to dismiss traditional approaches to PBL, which are valued by many institutions, but rather to expand views and possibilities within the larger PBL family. The lack of a definition and the introduction of variations creates a certain messiness, which for example can be problematic for research that tends to classify teaching approaches to distinguish them from other approaches. This aligns with increasing calls for context-specific educational research that considers the full complexity of the setting, as well as the approach.



“Different techniques might be used within different PBL settings that still might be aligned with the principles of contextual, constructive, collaborative, and self-directed learning.”

We started this chapter with critiques often heard about PBL nowadays, such as: “We still call our program PBL, but it is not true PBL”, “PBL sounds old-fashioned; PBL is not innovative.” In this chapter we raised other questions, such as: Does true PBL exist?, Which PBL approach is suitable for your educational context?, How can PBL approaches support students’ learning in various contexts? Although there are no ready-made answers and easy recipes for the challenges experienced in practice, our

answers are that PBL can take many shapes to address context specific needs and resources. We summarized briefly the principles underlying PBL; we gave examples of different shapes of PBL. We did not offer a recipe, but, at best, offered principles about what might work. These principles are based on learning and curriculum design insights or theories. The translation of these theoretical principles to the level of technique is not a straightforward, linear or simple process, but a matter of involving stakeholders' perspectives and considering the institutional, social and cultural context. What works best in which context is a matter of continuously reinventing PBL. This does not mean that we should have to discover it all for ourselves. This can be done in close collaboration with various stakeholders.

Based on theoretical principles and experiences of various stakeholders, schools considering a PBL approach have to 'reinvent' PBL and discover what might work in their specific context, with particular goals in mind to best meet the needs of their students. Ideally, we create time and space in our schools to reflect on our practices and theoretical principles, and set goals for improving teaching practices and initiating innovation projects. When contextualizing techniques and principles, it is crucial to keep in mind that they are realizations of the underlying educational philosophy. When they are modified, it is important to analyse if the modifications uphold the underlying theories and philosophy. The degree to which the technique chosen deviates from the underlying theories, the further the technique could be seen as a step away from the basic ideas underlying the family of PBL related approaches.

Teachers, researchers and students may collaboratively redesign, reflect upon and investigate their teaching practices; wondering which modifications are needed for which reasons and how they fit with the philosophy and theoretical principles based on instructional and learning insights. We should create opportunities for dialogue about what PBL is to us as teachers, to our institutions, and to our internal and external stakeholders (e.g., accreditation agencies). Dialogue could help clarify that there is no true PBL. It is an ongoing and constant process of rethinking, reinventing and revitalizing PBL, but also investigating PBL in close collaboration with researchers, teachers, students and other partners.



"What works best in your context is a matter of continuously reinventing PBL; based on theories and principles and in collaboration with various stakeholders."

Summary

There is no 'true' one-size-fits-all PBL approach. PBL belongs to a family of related student-centred, task-driven or problem-driven instructional approaches to learning. There are different views on PBL and there is no consensus on its techniques. The boundaries between and within different approaches in this family are blurry. PBL can take many shapes to address context-specific needs, resources, values and beliefs. Different techniques of PBL might be used, which still can be well-aligned with the principles of contextual, constructive, collaborative and self-directed learning and the underlying philosophy that PBL is an approach to stimulate students to apply knowledge or construct meaning through dialogue and interactions with others. Thus the 'label' (e.g., PBL or a different one) is perhaps not the most important thing; what matters ultimately is which PBL approach is most likely to achieve the learning goal given the contextual factors (e.g., institutional, social, or cultural specifics).

References

- Azer, 2011 Azer SA. Introducing a problem-based learning program: 12 tips for success. *Medical Teacher*. 2011;33(10):808–813.
- Bestetti et al., 2014 Bestetti RB, Couto LB, Romao GS, Araujo GT, Restini CB. Contextual considerations in implementing problem-based learning approaches in a Brazilian medical curriculum: The UNAERP experience. *Medical Education Online*. 2014;19:24366.
- Cianciolo and Regehr, 2019 Cianciolo AT, Regehr G. Learning theory and educational intervention: producing meaningful evidence of impact through layered analysis. *Academic Medicine*. 2019;94(6):789–794.
- Dolmans, 2019 Dolmans DHJM. How theory and design-based research can mature PBL practice and research. *Advances in Health Sciences Education*. 2019;24(5):879–891.
- Dolmans et al., 2015 Dolmans D, Michaelsen L, Van Merriënboer J, Van der Vleuten C. Should we choose between problem-based learning and team-based learning? No, combine the best of both worlds!. *Medical Teacher*. 2015;37(4):354–359.
- Fontejn and Dolmans, 2019 Fontejn HT, Dolmans DH. Group work and group dynamics in PBL. In: Moallem M, Hung W, Dabbagh N, eds. *The Wiley handbook of problem-based learning*. Hoboken, NJ: Wiley-Blackwell; 2019;199–220.
- Frambach et al., 2019 Frambach JM, Talaat W, Wasenitz S, Martimianakis MA. The case for plural PBL: an analysis of dominant and marginalized perspectives in the globalization of problem-based learning. *Advances in Health Sciences Education*. 2019;24(5):931–942.
- Giva and Duma, 2015 Giva KRN, Duma SE. Characteristics and critical success factors for implementing problem-based learning in a human resource-constrained country. *Curationis*. 2015;38 Art. #1283.
- Hmelo-Silver et al., 2019 Hmelo-Silver CE, Bridges SM, McKeown JM. Facilitating problem-based learning. In: Moallem M, Hung W, Dabbagh N, eds. *The Wiley handbook of problem-based learning*. Hoboken, NJ: Wiley-Blackwell; 2019;297–319.
- Hung et al., 2019 Hung W, Dolmans D, van Merriënboer J. A review to identify key perspectives in PBL meta-analyses and reviews: trends, gaps and future research directions. *Advances in Health Sciences Education* 2019;1–15.
- Neville et al., 2019 Neville A, Norman G, White R. McMaster at 50: lessons

learned from five decades of PBL. *Advances in Health Sciences Education*. 2019;24(5):853–863.

[Schmidt et al., 2019](#) Schmidt HG, Rotgans J, Yew E. Cognitive constructivist foundations of problem-based learning. In: Moallem M, Hung W, Dabbagh N, eds. *The Wiley handbook of problem-based learning*. Hoboken, NJ: Wiley-Blackwell; 2019;25–50.

[Wijnia et al., 2019](#) Wijnia L, Loyens SMM, Rikers RMJP. The problem-based learning process: an overview of different models. In: Moallem M, Hung W, Dabbagh N, eds. *The Wiley handbook of problem-based learning*. Hoboken, NJ: Wiley-Blackwell; 2019;273–295.

Team-Based Learning

Dean Parmelee, Irina Overman and Abbas Hyderi

Trends

- Team-based learning (TBL) is a clearly defined and effective active learning strategy suitable for large classes.
- Learners have individual and team accountability to master course content, work collaboratively to solve problems, and contribute to one another's education.
- The instructor, a content expert, poses questions, stimulates debate, and clarifies only when necessary.
- TBL assures knowledge mastery, authentic application of knowledge, development of effective teamwork, and self-directed learning.

Key concepts

- Advance assignment: out-of-class assigned student preparation for a team-based learning session, content mastery before class.
- Readiness assurance: short set of multiple-choice questions (MCQs) that assess the level of mastery of the content in the advance assignment, providing immediate feedback to students when they discuss the questions within their team for consensus understanding.
- Application exercise: students are challenged to use what they have learned from the content to evaluate, analyse and apply it, creatively, to complex clinical questions.
- The 5 'S's: the key to an engaging application exercise: significant problem, specific choice, same question, simultaneous report, self-directed learning.

What is team-based learning?

Team-based learning (TBL) is an active learning instructional strategy that provides opportunities to apply conceptual knowledge through a sequence of events that includes individual preparation, assessment of the quality of the preparation with immediate feedback with team members, and collaborative work to solve authentic problems that are encountered in clinical medicine. It is representative of the 'flipped-classroom' in that students are responsible for learning course content outside of the class time and apply it during class. The instructor's role is profoundly different from composing and delivering a content-based lecture; it focuses on creating and facilitating learning activities that enable the student to use the course content in ways that may endure ([Michaelsen & Sweet, 2008](#); [Parmelee & Michaelsen, 2010](#); [Parmelee et al., 2012](#)).

Although TBL was initially developed for the business school environment in the early 1990s, its use in health professions education and other disciplines has been extensive. There are numerous studies on its academic effectiveness ([Huggins & Stamatel, 2015](#); [Nieder et al., 2005](#); [Reimschisel et al., 2017](#); [Thomas & Bowen, 2011](#)), how it likely enhances learning ([Hrynychak & Batty, 2012](#); [Schmidt et al., 2019](#)), and attends to noncognitive skills development ([Alizadeh et al., 2017](#); [2018](#); [Borges et al., 2012](#); [Haidet et al., 2014](#); [Thompson et al., 2015](#)).

What makes team-based learning work?

There are several essential components of TBL ([Haidet et al., 2012](#)). These components and TBL's sequence of learning activities work together to enhance learning ([Schmidt et al., 2019](#)). Using its prescribed sequence, the student independently learns content before class, retrieves it for a short quiz at the beginning of class known as the individual readiness assurance test (IRAT), then retrieves it again for the same quiz taken in discussion with teammates known as the team readiness assurance test (TRAT). The TRAT provides immediate feedback on their choices. This is followed by the application exercise (AppEx) where the assigned content must be retrieved again and applied to solve complex questions or problems as a team. Beyond learning and using course content, the student also learns (through practice) how to prepare well independently, how to explain thinking and choices, and how to engage in argumentation, which is essential to learning science ([Osborne, 2010](#)).

Orientation

The instructor orients the class to the 'how' and the 'why' of TBL at the beginning of the course. The how is easily remembered because the TBL learning process fits so well with how people learn. The why needs revisiting throughout the course as the instructor notes behaviours in the class that demonstrate why the strategy supports their learning content and collaboration. An example of this happens during the first debriefing of the TRAT questions where consensus decisions must be made. The instructor can invite a team to share with the class how they are making decisions, that is, voting, relying on one person who seems to know the answer, having each member explain their rationale, encouraging or discouraging different opinions? By interjecting a reflection on what is happening as a team begins to work together, the instructor reinforces one of the big whys for TBL; it promotes collaborative learning. [Balan et al. \(2015\)](#) have shared a number of additional ideas for the orientation process.

Team formation

Creating the classroom teams should be done only once during a semester or year with the team being the same across courses. This is essential for the success of TBL and done best during Orientation. Once teams are formed, the members of each team need time to learn how to collaborate with each other. What they learn about this process over the period of a semester or a year endures as they continue to work with new teams throughout their careers. The following are principles of team formation that transform small groups into learning teams:

- Make the process of how members are assigned to a team transparent. When assigned, each student knows how it happened and why.
- Do not allow students to self-select their teammates. No other process will do as

much damage to classroom dynamics than having students self-select with whom they want to work.

- Distribute the class's 'wealth and resources' into the teams. How wealth and resources are defined depends on context. Creating teams that have a diversity of background, experience, country of origin, age, career interest, and gender will generate relationships and discussions that will be rewarding for the students and the instructor.
- Have no fewer than five, no more than seven members on a team.

Peer feedback and evaluation

There are many ways to design a process for students to give and receive constructive feedback on how they are contributing to one another's learning, and one can construct ways for them to assign marks to their peers that become part of a course grade (Cestone et al., 2008; Michaelsen et al., 2004). In general, however, students working together in teams do not want to make negative comments about or give 'low scores' to anyone on their team, even if the process is anonymous. We recommend framing the process such that students highlight the strengths they see in one another and make suggestions for improvement, if necessary. Instructing the students in giving and receiving oral feedback followed by time allotted to practice this within teams (Sheakley, 2019) is another approach that holds promise for enhancing teamwork skills.



Tip

Selecting learning activities can be a challenge for those in medical education since the lecture-based pedagogy has been the mainstay for so many years. TBL can eliminate lectures that are primarily 'information transmitting', for the content can be assigned from a text, PowerPoint with notes or even a multimedia online tutorial. Or students can be given the 'case' of the application exercise to clarify what they already know and learn what they feel they do not know to be able to address questions that it will generate in class.

Sequence of learning activities

The following details the sequence of learning activities that occur in a TBL session. Since TBL was introduced in health professions education (HPE), instructors have created adaptations to address specific course and programme needs, and some of these are described to exemplify the versatility of the strategy.

1 Advance assignment

For each session, students receive recommended learning activities intended to prepare them for the readiness assurance test (RAT) and the AppEx. This may include textbook

or other readings, videos, online quizzes, review of findings from laboratory or dissection assignments, and previously learned material useful for the session. We recommend reading assignments because reading develops critical thinking (Karpicke, 2012). For courses occurring closer to the beginning of direct patient-care experiences, the assignment can be the clinical case that will be the focus of the AppEx. The case can be in video or written format and the student identifies and posts their learning objectives and what resources will be most credible to master the biomedical and clinical science that underpins this case. Learning management systems facilitate this self-directed learning practice and provide instructors with opportunities to monitor the depth of student learning and provide helpful feedback.

2 Readiness assurance test

The RAT is a short multiple-choice question test (usually 10–15 questions) derived from the Advance Assignment. First, the students take it individually (IRAT), then they take it with their team (TRAT). The team must make consensus decisions on the questions. Questions must be of high quality (we recommend using National Board of Medical Examiners [NBME] formatting) and not simple recall. In general, the mean score of the class on the IRAT should be near the class mean for the course. The mean score on the TRAT is invariably much higher.

Learning content occurs when the students prepare through the Advance Assignment, when they use ‘retrieval’ to answer the questions on the IRAT, and again when they must explain their answer choices and learn how others answered during the TRAT. The peer-peer discourse during the TRAT is a profound learning experience because one must explain one’s thinking and integrate immediate feedback from peers. In the process of the team making its consensus decisions, the individual learns how to articulate the reasoning behind a decision, and then defend it further when challenged by a peer who has a different answer. Because there is a grade incentive (however small) for the team to do well, the individual learns to listen carefully to a peer’s reasoning for it may be better and lead to the ‘better’ answer. As a team learns collaboration, individuals learn to place their egos aside for the team’s benefit. The best written RAT questions are those that generate the most energetic discussions.

While the class is engaged in the TRAT, the instructor ‘listens in’ to team discussions, after making it clear that they will not answer any questions. Doing this provides invaluable information about how students are processing the content. Understanding how they are thinking is critical to facilitating the whole class discussion that follows the TRAT and the subsequent AppEx. Different from the lecture format, the instructor can readily identify the gaps in knowledge and what concepts are most challenging for the class, then address them through probing questions and clarifications.

There are different ways to administer the RAT. For many years, the most popular tool for the TRAT portion is the IF-AT™ (Immediate Feedback Assessment Technique, Epstein et al) that has ‘scratch off’ options for each question’s options like a lottery ticket. The ‘correct’ answer lies hidden under the ‘scratch off’ with either a smiling face or an asterisk; incorrect answer choices with a blank space when scratched. A team works hard to ‘get it right’ the first time, but the grading rubric can be constructed so

that they can select a couple more times but not get full credit for that question. This format provides immediate feedback to a team on their decision-making, and if they are incorrect, they debate further before selecting their next choice. It is remarkable how teams work to discover 'best' answers; most often a class's TRAT mean score will be in the upper 90s. Technology has created electronic formats that administer the RAT securely and have the TRAT portion with 'scratch offs' type functions as well. The electronic formats also provide the instructor with rapid posting of both individual and team performance data.



Tip

Write flawless multiple-choice questions (MCQs). If they are good questions and are foundational to the AppEx, then you do not have to worry about content coverage: the students will learn it and be able to use it.

3 Instructor clarifications and appeals

After the TRAT, the instructor facilitates a whole class discussion on those questions or concepts that were most problematic for the students. Although the instructor may quickly clarify in a 'teaching moment,' alternatively they can elicit student explanations and affirm those that meet the teaching point. In addition, the instructor can consider using an appeals process in which a team (not an individual) submits a written appeal on a question that they feel was either written poorly and led them astray, or the instructor's answer is wrong and they have a good rationale or credible reference to support their choice. This process has two benefits: it inspires teams to go the 'extra mile' to learn more and defend their reasoning in writing; and, if the question was poorly written, then their critique will make for an improved question the next time that TBL is used.



Tip

Make your 'teaching moments' brief and in direct response to where you see gaps in student knowledge. The TBL process will provide you with continuous information about what your students know and don't know.

4 Application exercise

The AppEx is the most important component of TBL. Students, in teams, are presented with a scenario/vignette that is similar to the type of problem with which they will be grappling in their careers. They are challenged to analyze and interpret data, make hypotheses about what has led to the current clinical presentation, what might transpire

next with or without intervention, even create a diagnostic or treatment plan. Depending on the course and level of training, this is the opportunity for students to learn and practice evaluating evidence to support their decisions, and receive feedback from their peers and the instructor on their evidence and rationale.

It is vital that all teams in a class work on the same problem at the same time and be accountable to present their findings to the class. The quality of learning diminishes quickly if there is any 'divide and conquer' approach to the task. Competition between teams to develop a compelling rationale for a decision is a powerful motivator for learning. The instructor's facilitation of team explanations for interpretation of confounding diagnostic tests, choice of a novel treatment, or prioritization of interventions promotes the critical thinking necessary for clinical reasoning.

The AppEx encourages the instructor to be creative. By adhering to the following 5 'S's, the instructor crafts a learning activity in which students must use their content knowledge and solve problems that require all members of a team to work collaboratively.

1. Significant problem or question: Students in HPE are focused on two things: passing their qualifying examinations and being able to do what is expected of them at the next level of their training which includes providing excellent individual patient care addressing health systems science issues. Well-designed and facilitated TBL modules provide them opportunities to master the content that is tested by MCQs on qualifying examinations and develop clinical reasoning by working through clinical cases that require more than 'pattern recognition.' A difficult intellectual task for instructors accustomed to lecturing is to identify a clinical case that is both representative of a common presentation and has features that are unique and confounding. Student engagement with the case depends on how the questions, team and class discussion, and instructor facilitation highlights its learning significance.
2. Specific choice: A number of interpersonal and teamwork skills are required for a small group (5-7) to make a consensus decision. Similar to what transpires in the TRAT, individuals on a team have different knowledge, ways of interpreting data, and ways of articulating their rationales. The engagement between them when a single, specific choice must be made is a powerful learning exercise both for content, critical thinking, and learning to work collaboratively. In the AppEx, the most engaging questions are those that have more than one 'best' answer and require a team's consensus choice based on careful consideration of the data. The instructor's content expertise and facilitation of robust argument leads to deep learning and prepares students for grappling with the ambiguities of clinical decision-making that often requires making a specific choice after considering many variables.
3. Same problem or question: As long as teams are striving to answer a specific choice question and prepare to explain and defend it to the whole class, individual engagement will be high. To assign different problems to different teams, expecting 'team' presentations, results in wasted time. Once a team has

presented, they lose interest and are ready to leave. Teams, waiting to present, become bored with the presentations because they were not assigned those problems.

4. Simultaneous report: There are many ways to have a 'simultaneous' reporting of team decisions. For the instructor, the reason for this is to know the diversity of consensus-driven decisions in the class; the more there are, the richer the discussion will be on the problem. For students, they learn that other teams came up with different approaches and, more often than not, become determined to defend their own team's choice. Examples of how simultaneous reports can be done:
 - a. Teams have a set of large cards each displaying a letter or number for possible choices, for example, A, B, C, D, E and so on. The card can be held up or attached to a team flagpole that also has the team name or number.
 - b. Teams have a white board that can be 'held up' showing their choice.
 - c. Teams have large poster paper sheets on which they succinctly write out an answer, show a calculation, draw the anatomic location of a lesion. Teams post their sheet at the same time on the surrounding walls.
 - d. Electronic display on classroom screen or screens. Some institutions have an LCD display located close to each team in the classroom.
5. Self-directed learning: TBL provides many opportunities for self-directed learning, and, as with the AppEx, the instructor can be creative by incorporating learning activities to promote it. The advance assignment identifies the minimum preparation for the module, specifically the RAT. Students realize early on that going beyond the 'minimum' prepares them for greater engagement during the TRAT and the AppEx. The assignment can require students to individually post responses to a foreground or background question on the topic along with their appraised sources. The AppEx, structured with 'open-book' or 'open-internet' periods, can have individuals and teams investigate knowledge gaps or unanswered questions from the module's case, and post their findings for feedback from both peers and instructor; this is where creatively designed technology support enhances learning both in and out of the classroom!

Some institutions have used an approach whereby after the conclusion to the application exercises, each team identifies a learning need or gap and formulates a question, performs a literature search, identifies and analyzes one or more sources with regard to strengths and weaknesses, and synthesizes the information to answer the question with faculty providing subsequent feedback to the team about their information seeking and critical appraisal skills.



Tip

Promote and sustain student engagement in the AppEx by frequently innovating the activities each session, preferably with hands-on assignments like drawing pathways, use a Sim Center or manikins; manage time carefully to minimize 'drift;' vary the amount of access to the internet; keep meaningful clinical application at the forefront.

Instructor wrap-up

During the last 10 minutes of every TBL module, the instructor has an important ‘teaching moment’ and revisits the key learning goals for TBL identified in the Orientation. It is the time for the instructor to share what they have learned about the class’s knowledge and thinking and what they observed about how teams are using collaboration. This is done by asking questions, such as ‘Write down the one most valuable thing you learned in this exercise today’ and inviting responses and discussion. Or they may summarize how the module’s learning objectives were met and make suggestions for additional study to address any gaps in preparation for the next module.

Frequently asked questions

1. My students are obsessed with getting high scores on their qualifying exams and want me to tell them what they need to know. How can I change this attitude about learning?

Although qualifying examinations require content to be recalled, their emphasis is increasingly on assessing the ability to use content to solve clinically focused questions. During orientation, show a sample recall question, then one where they have to know the content and its related concept to understand and solve the question. Craft RAT questions to require applying what they learned from the advance assignment and your AppEx questions should require the whole team to solve. Throughout every module, probe student thinking about how they arrive at a decision and acknowledge and affirm how they are using the content.

Many students have had very negative ‘group learning’ experiences. TBL provides a different experience because of its structure for accountability and the learning power that develops within teams. The TRAT process teaches even the very bright student that they can learn from a teammate. Academically struggling students fill gaps in their knowledge base and learn to think critically about the content through the discourse with peers. Their initial insistence that the instructor ‘teach’ will diminish as the students realize that they are learning more through their preparation, collaborative work with peers and the instructor’s emphasis on learning how to learn and apply the content.

2. The work involved in putting together just one TBL module seems overwhelming. Is it going to be worth all the extra effort on my part?
Students learn more in active learning classrooms than in lecture-format instruction (Deslauriers et al., 2019; Freeman et al., 2014). Yes, it is much more work for instructors to transform their teaching to one of the active learning strategies, TBL being one of them. Although most of the scholarship on active learning, TBL included, has focused on learner outcomes, it has been our experience that instructors who enjoy being a part of student learning and

growing feel that making the transformation brings new meaning to their teaching role.

3. My students love the RAT—quality of the questions is at the level of their examinations, teams are truly debating most the questions with each other and getting to the best answers. But, during the AppEx, there is a drop-off in engagement, more ‘shopping’ on their computers than working on the questions. What can I do to keep full engagement throughout the module? There are several possible explanations for what is happening. Here are a few ideas to address this common phenomenon:

- Time-management. Keep your module time limit at 2 ½ hours, with those last few minutes at the conclusion to summarize, give and get feedback. Limit the amount of time for teams to complete a problem on the AppEx, including the discussion phase.
- Use fewer questions in the AppEx. Often in our zeal to ‘cover content,’ we put in more questions than can be addressed within the time. Craft no more than 2 to 3 problems or questions and go for ‘depth’ over breadth.’
- Limit web-access device time requiring them to ‘think’ rather than Google.
- Be creative with your AppEx. Most HPE modules consist of a rolling-case with a series of predictable questions, that is, primary diagnosis, interpretation of diagnostic finding, treatment options—all in MCQ format. Using large post-its or audio-visual displays by teams of their prioritized treatment plans, have the class decide which one or ones are likely to have the least risk. The Team-Based Learning Collaborative website and MedEdPortal are great resources for creative ideas.

4. My institution’s leadership wants us to move to active learning in the classroom, but all our classroom are fixed-seating lecture halls. How can we get started with TBL?

Some ideas to consider:

- If there are more seats than students, then cluster the students into teams within the class. If the classroom seating is just enough for the class, split the class in half—do the TBL module twice.
- Because acoustics are poor in the fixed-seating arrangement (it was never designed so that students would be heard) have students stand up when they speak to the class.
- Carefully organize materials so each team gets a complete packet. One person on each team can be selected by the team to manage the materials.
- Use a set of laminated letter cards (A, B, C, D, E) for each team to display their choices.
- Convince the leadership of the need to design and build active learning classrooms.

5. What are advantages of TBL as an active learning strategy?

- The incentive structure: builds individual accountability and within-team loyalty and accountability.
- Content learning: its sequence of learning activities use retrieval-based

practice and collaborative discourse.

- Application of knowledge: application of knowledge is the key learning objective.
- Self-directed learning: the more engaged students become in learning with TBL, the less they rely on the instructor to 'teach' them. They become more open to learning from peers and on their own.
- One instructor: no need for multiple instructors, although small teams of faculty from the biomedical and clinical sciences create high yield learning in clinical reasoning.
- One room: no need for multiple small group rooms.
- Immediate feedback: students receive immediate feedback about their mastery and use of content. Instructors receive immediate feedback on student academic performance.
- Collaborative learning: it is unnecessary to give instruction on 'teamwork.' Students learn how to work together through the process of TBL. To become an effective team, members practice distributed leadership, prepare well so they can contribute, and let go of 'ego' for the sake of the team's success. Within-team competition is minimal but is very much there between teams.

Summary

TBL can be an exhilarating learner-centred instructional strategy for both the instructor and students. For an individual module or a whole course using TBL to be successful, the instructor must adhere to the steps and principles emphasized in this chapter. Based on our many years of experience with TBL, we are convinced that it is ideal for medical education because of its emphasis on accountability, collaboration with peers, critical appraisal, and specific choice decision-making. We consider TBL as an evolving teaching and learning strategy, one that will continue to benefit from research ([Reimschisel et al., 2017](#)) on how it works (contextual factors, team dynamics, retrieval-based learning and memory consolidation, skills for self-directed learning, and facilitator skills) and on instructors being creative in finding new ways to make it more effective ([Dolmans et al., 2015](#)).

References

- [Alizadeh et al., 2018](#) Alizadeh M, Mirzazadeh A, Parmelee D, et al. Leadership identity development through reflection and feedback in team-based learning medical student teams. *Teaching and Learning in Medicine*. 2018;30(1):76–83.
- [Alizadeh et al., 2017](#) Alizadeh M, Mirzazadeh A, Parmelee DX, et al. Uncover it, students would learn leadership from team-based learning (TBL): the effect of guided reflection and feedback. *Medical Teacher*. 2017;39 395–340.
- [Balan et al., 2015](#) Balan P, Clark M, Restall G. Preparing students for flipped or team-based learning methods. *Education and Training*. 2015;57(6):639–657.
- [Borges et al., 2012](#) Borges NJ, Kirkham K, Deardorff AS, Moore JA. Development of emotional intelligence in a team-based learning internal medicine clerkship. *Medical Teacher*. 2012;34(10):802–806.
- [Cestone et al., 2008](#) Cestone CM, Levine RE, Lane DR. Peer assessment and evaluation in team-based learning. *New Directions for Teaching and Learning*. 2008;116:69–78.
- [Deslauriers et al., 2019](#) Deslauriers L, McCarty LS, Miller K, Callaghan K, Kestin G. Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom. *Proceedings of the National Academy of Science*. 2019;116(39):19251–19257.
- [Dolmans et al., 2015](#) Dolmans D, Michaelsen L, Van Merriënboer J, Van Der Vleuten C. Should choose between problem-based learning and team-based learning? No, combine the best of both worlds!. *Medical Teacher*. 2015;37(4):354–359.
- [Freeman et al., 2014](#) Freeman S, Eddy SL, McDonough M, et al. Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Science*. 2014;111(23):8410–8415.
- [Haidet et al., 2014](#) Haidet P, Kubitz K, McCormack WT. Analysis of the team-based learning literature: TBL comes of age. *Journal on Excellence in College Teaching*. 2014;25(3-4):303–333.
- [Haidet et al., 2012](#) Haidet P, Levine RE, Parmelee DX, et al. Perspective: guidelines for reporting team-based learning activities in the medical and health sciences education literature. *Academic Medicine*. 2012;87(3):292–299.

- [Hrynychak and Batty, 2012](#) Hrynychak P, Batty H. The educational theory basis of team-based learning. *Medical Teacher*. 2012;34(10):796–801.
- [Huggins and Stamatel, 2015](#) Huggins CM, Stamatel JP. An exploratory study comparing the effectiveness of lecturing versus team-based learning. *Teaching Sociology*. 2015;43(3):227–235.
- [Karpicke, 2012](#) Karpicke JD. Retrieval-based learning: active retrieval promotes meaningful learning. *Current Directions in Psychological Science*. 2012;21(3):157–163.
- [Michaelson et al., 2004](#) Michaelson LK, Knight AB, Fink LD. *Team-based learning: a transformative use of small groups in higher education* Sterling VA: Stylus; 2004.
- [Michaelson and Sweet, 2008](#) Michaelson LK, Sweet M. The essential elements of team-based learning. In: Michaelson LK, Parmelee DX, McMahon KK, eds. *Team-based learning: small group learning's next big step New directions for teaching and learning*. San Francisco: Jossey-Bass; 2008;7–28.
- [Nieder et al., 2005](#) Nieder GL, Parmelee DX, Stolfi A, Hudes PD. Team-based learning in a medical gross anatomy and embryology course. *Clinical Anatomy*. 2005;18:56–63.
- [Osborne, 2010](#) Osborne J. Arguing to learn in science: the role of collaborative, critical discourse. *Science*. 2010;328(5977):463–466.
- [Parmelee et al., 2012](#) Parmelee D, Michaelson LK, Cook S, Hudes PD. Team-based learning: a practical guide, AMEE Guide No 65. *Medical Teacher*. 2012;34.
- [Parmelee and Michaelson, 2010](#) Parmelee DX, Michaelson LK. Twelve tips for doing effective team-based learning (TBL). *Medical Teacher*. 2010;32(2):118–122.
- [Reimschisel et al., 2017](#) Reimschisel T, Herring AL, Juang J, Minor TJ. A systematic review of the published literature on team-based learning in health professions education. *Medical Teacher*. 2017;39(12):1227–1237.
- [Schmidt et al., 2019](#) Schmidt HG, Rotgans JJ, Rajalingam P, Low-Beer N. A psychological foundation for team-based learning: knowledge reconsolidation. *Academic Medicine*. 2019;94(12):1878–1883.
- [Sheakley et al., 2019](#) Sheakley ML, Bauler LD, Tanager CL, Newby D. Student perceptions of a novel approach to promote professionalism using peer evaluation in a team-based learning setting: a quality improvement project. *Medical Science Educator*. 2019;29:1229–1232.
- [Thomas and Bowen, 2011](#) Thomas PA, Bowen CW. A controlled trial of

team-based learning in an ambulatory medicine clerkship for medical students. *Teaching and Learning in Medicine*. 2011;23(1):31–36.

[Thompson et al, 2015](#) Thompson BM, Haidet P, Borges NJ, et al. Team cohesiveness, team size and team performance in team-based learning teams. *Medical Education*. 2015;49(4):379–385.

Online resources

Epstein Educational Enterprises Epstein Educational Enterprises,
Immediate Feedback Assessment Technique (IF-AT) form:

<http://www.epsteineducation.com>.

National Board of Medical Examiners (NBME) National Board of
Medical Examiners (NBME) Item Writing Manual:

<http://www.nbme.org/publications/item-writing-manual-download.html>.

Team-Based Team-Based Learning Collaborative website:

<http://www.teambasedlearning.org>.

Digital Technologies in Medical Education

Rachel H Ellaway

Trends

Much of our lives are mediated by the use of digital technologies. This has impacted both medical education and medical practice. This chapter considers four areas of technology use in and around medical education:

- Medical teachers are making need to know why, where, when, and how to best use these technologies, as well as why, where, and when not to use them.
- Medical education and practice need to be appraised and aligned with the presence of technology in all aspects of modern life.
- Medical teachers need to prepare their learners to use digital technologies for healthcare, as well as educational purposes.
- The data generated from using digital technologies can be analysed to guide education practices and thinking.

Key concepts

- Analytics: the use of data, both educational and noneducational, to inform learning and teaching strategies and outcomes.
- Digital professionalism: medical professionalism in the context of the use and presence of digital technologies.

Introduction

Medical education has always used educational technologies; books, buildings, photography and models have each played a critical role in shaping the practices and possibilities of medical education. Nevertheless, when we think about technology, we tend to focus on digital technologies; the computing devices, software, services, and network infrastructures that pervade and underpin so much of what we do. Arguably, there is little in the modern world that is not touched by digital technology now that the worldwide web, mobile technologies, and cloud computing are the default media for so much of our everyday lives. Medical education has not been immune from this shift.

Digital technologies are not just a means to an end in medical education, they can change us and they can change the ends we are seeking to achieve. It is important therefore that medical teachers appreciate when and how to use (and not to use) digital technologies in their teaching practices. They also need to appreciate how their learners, their working environments, and their societies are being shaped by digital technologies.

There are many textbooks that describe different kinds of educational technologies, how to use them, and the impacts these technologies can have on teaching and learning ([Clark & Mayer, 2008](#); [Horton, 2006](#)). Rather than reprising their ideas here, I will focus on four ways in which technology both shapes and can be used by medical teachers: technology as medium; technology as context; technology as outcome; and technology as intelligence.

Technology as medium

Technologies have little value unless they are actually used. Medical teachers should therefore know how to use digital technologies to support and enable what they do. They also need to be prepared to make use of the many possibilities of using digital technologies and not be limited to their original intended uses.

In terms of what medical teachers may draw on, the list of technologies used in contemporary medical education is long and is growing longer all the time. Resources, such as multimedia learning packages, podcasts and videos can be used in support of instruction, both in the classroom and for independent study. Online simulation resources, such as virtual patients, can be used to practice and hone skills, such as clinical decision-making. Teachers and learners can communicate and collaborate with each other on educational projects and activities using a wide range of media (social media, webinars, wikis etc.), and they can publish the outputs of their work through blogs, websites, and open media sites, such as YouTube. Reference materials, such as drug databases, clinical handbooks, and the research literature, can be readily used in classroom, bedside, and independent learning activities, and the results of learning activities and participant reflections on those activities recorded in clinical encounter logging systems and portfolios. Technologies for formative and summative assessment, such as online quizzes and formal computer-based proctored exams, can track and analyse learner performance. Curriculum maps can support curriculum planning and audit. Indeed, almost every aspect of contemporary medical education practice does or can involve digital technologies.

Digital technologies act as mediating artefacts; they provide the medium for undertaking particular kinds of activities. Indeed, it is this mediating role that makes them both essential and peripheral to the focus or the outcomes of the activities they support.

Why use digital technology?

Clearly there are a great many ways in which digital technologies can be used. But why use technology at all? Are there any activities in medical education where using educational technologies are the best way to teach or learn? The gold standard for education typically involves face-to-face individual tutoring with little or no technology mediation. Moreover, there are few, if any, learning theories that are predicated on the use of technologies. So, again we can ask: why use technology at all? The answer can be found in the transforming nature of digital technologies, which I have grouped into the following domains:

- Exponential connectivity: Digital technologies allow us to access content, services, and people in unprecedented ways. Where once we might have had to go to a library or sought out a face-to-face meeting with a subject expert to get the answer to a question, we can now access a multitude of online materials and

opinions, and we can more easily associate individuals, materials and perspectives than ever before.

- Accelerating speed of action and response: Digital technologies can make communication, action and reaction much faster. Things that may otherwise take days or weeks without digital technologies may take just moments when using them. However, this can also mean we give ourselves less time to reflect on the consequences of our actions, and we may develop a lower tolerance for delays or things that take time to develop and mature.
- Defeating geography and temporality: Digital technologies can significantly extend the reach of our actions. For instance, geographically distributed learners can study together and patients and physicians at different locations can interact using telehealth networks. Interestingly, one reaction to this extended reach has been a tendency for students to value face-to-face encounters more than online ones.
- Massive integration: Digital technologies can be used to integrate a variety of services and information, reflected for instance in the use of learning management systems that integrate educational content, logistics, and communication into a single platform. However, integration also means more interdependence between system components, which can in turn make systems more and more vulnerable to errors and failures.
- Panopticism: Digital technologies can track and record almost any action their users make. While this provides the ability to provide rich feedback and modelling of learner behaviours it can also reduce learners' autonomy to explore and their freedom to express themselves without being overseen and judged for it. I will return to this point in the Technology as intelligence section.

In essence, the affordances of digital technologies let us change the rules regarding how we work and how we interact with information and each other. The affordances of digital technologies can help teachers and learners to save time and effort in remembering, repeating, finding, recording and structuring information and knowledge. These affordances can expand the reach of teaching and learning beyond physical limitations (potentially engaging more learners distributed across multiple locations). They can expand interaction beyond temporal limitations (teaching can be asynchronous—happening whenever is convenient rather than setting a single time for everyone). These affordances can also help us to organize and connect learners and teachers in support of a multitude of learning activities, and they can record and track teacher and learner actions in these activities. If you need some (or indeed all) of these advantages then technology can be useful in mediating your activities, if you do not need them then digital technologies may not play much of a role in your teaching practice.



"Digital technologies let us change the rules regarding how we work and how we interact with information and each other."

Technology and instructional design

Using technology in medical education may happen relatively spontaneously but it is far more common (and advisable) for medical teachers to design and plan their use of technologies, and to blend them into their teaching practice. This is called instructional design ([Richey et al., 2011](#)), which involves designing things to use (tools, materials) and designing things to do (activities) by considering:

- Who are your learners and what learning processes work best for them? Not all young people are keen on using digital technologies; there are likely to be learners who are very interested in using technology and others who are not. Medical teachers should be clear what technology use works best for their learners.
- In what contexts will technologies be used? The efficacy of using digital technologies depends on the context in which they are used. For instance, medical educators need to know whether there is adequate network and electrical power for their learners' devices, what the expectations are regarding what constitutes appropriate and inappropriate uses of technology, and how to be a digital professional (see later section in this chapter).
- What content will be involved, how should it be structured and sequenced? Designing things to be used should draw on learning theories (such as those pertaining to sequencing and cognitive load) and empirical evidence ([Mayer, 2009](#)). Other considerations include the testing and ensuring the usability of learning resources (making sure that their design and presentation is clear, unambiguous and accessible), and making sure that copyright and other licensing issues are addressed. The latter can be particularly daunting, and help from your library or other institutional supports may be advisable or even required.
- What instructional and noninstructional strategies should you use? Medical teachers need to decide what learners and teachers will be asked to do. Activities are typically based on an existing repertoire of approaches the teacher is familiar with and that are likely to afford the desired learning outcomes for the specific learners and learning contexts. It is beyond the scope of this chapter to describe the multitude of ways in which activities can be built around or using digital technologies. However, as other chapters in this volume explore the many dimensions of contemporary medical education the use of technologies is present, both explicitly and implicitly, throughout. One particular advantage to using technology is that it can extend the traditional repertoire of medical education activities to create new and hybrid activities. For instance, a lecture is 'flipped' when the didactic materials are prerecorded and put online for learners to study before class and the face-to-face time used for application and problem solving. Medical teachers are encouraged to think of activities and the uses of technologies as patterns that can be combined and recombined to create innovative and effective responses to novel learning situations ([Ellaway & Bates, 2015](#)).

- Consider what media and delivery systems you are going to use. Medical teachers need to select which tools and devices will be used, and this often involves a compromise between the ideal and the practical. For instance, the cost of developing bespoke software to meet a specific teaching need means that this is rarely the path medical teachers take (although it is not unheard of). Medical teachers tend to only use those technologies that are immediately available to them. For instance, most schools have some kind of online learning management system that provides generic course tools, such as file repository, discussion and calendar functions. Other generic educational tools and systems (Clark & Mayer, 2008; Horton, 2006) include online portfolios, evaluation systems, clinical encounter logging, and assessment systems. Noneducational tools can also be used, such as wikis for collaborative writing, blogs for reflective writing and webinar tools for small group work. Tools and systems that are specific to medical education (Ellaway, 2007) include virtual patients, online reference materials, and streaming procedural skills videos.



"There are two distinct kinds of practice: e-teaching (what the teacher does) and e-learning (what the learner does)."

The role of the medical e-teacher

The use of digital technologies for education is usually defined and led by teachers rather than learners. It therefore helps to separate out two distinct kinds of practice: e-teaching (what the teacher does) and e-learning (what the learner does). Medical e-teachers select the technologies they use, they facilitate their learners' activities through and around these tools, and they use them to evaluate and appraise their students' performance.

It is an ongoing challenge that the best learners tend to make use of every opportunity afforded them whereas less able learners tend to avoid them. If the goal is to help these less able learners, then the use of technology needs to align with their needs and the ways that they approach their learning. Simply making something available may increase the gap between the most and least able rather than closing it. For instance, self-diagnostic quizzes with targeted feedback can often help less able learners or those struggling with certain core concepts much more than multimedia rich resources can.

It is also important for medical teachers to ensure that their technology-enabled activities are integrated into and aligned with the curriculum. If e-teaching is not in alignment with the rest of the curriculum, then it introduces dissonance and confusion for the learner, as well as sending mixed messages regarding what is and is not important. Using technology for teaching should also better prepare teachers for more traditional face-to-face teaching practices.

Teachers' and learners' experiences of using any given technology may be quite different. For example, the way a teacher uses PowerPoint or a learning management

system is very different from the way their learners use these tools. Some technologies, such as tracking and analytics, are almost exclusively used by teachers or course leaders, whereas others, such as educational apps and virtual patients, are almost exclusively used by learners. Moreover, not everyone uses technology to the same extent. In every class, there will be students who are less interested in using digital technologies, as well as those who actively embrace them. The contemporary medical teacher clearly has to encompass variation in technology use in many dimensions.

In conclusion, digital technologies can provide a wide range of media that can be used for many different medical educational applications. However, the selection and function of any given technology is perhaps less important than the use of good instructional practices and a focus on the needs of different learners and the intended outcomes of your educational activities and programmes.

Technology as context

Whether or not a medical teacher does or does not use digital technologies in their teaching, it is very likely that they are working in environments that are to some extent mediated by digital technologies. After all, almost everyone has a cell phone or smartphone, and most learners and teachers also use laptops, tablets, and other digital technologies throughout their working days. It is important therefore for medical teachers to understand and ground their practices in this increasingly ambient use of digital technology that forms much of the context for medical education today.

Using digital technologies in medical education is not solely about adding their advantages to what we do. There are also drawbacks and problems that can arise from the use of digital technologies, and to that end, medical teachers should be aware of the less desirable implications that accompany the benefits of using these technologies. We can frame this in terms of the formal, hidden, informal and null curricula of technology use in medical education ([Ellaway et al., 2013](#)):

- The formal curriculum of digital technology use tends to be small and often consists of no more than instructions to learners as to what they must do, what they may do, and what they must not do with their digital technologies. Medical students' appropriate use of social media is a growing topic of concern but has not, so far, become a core part of formal medical curricula.
- The hidden curriculum of digital technologies reflects the unspoken institutional expectations and cultural norms that influence their use. First and foremost, it is reflected in the expectations that: (a) learners and teachers have the appropriate digital technologies to let them perform their roles, (b) they know how to use these technologies appropriately, and (c) they know how to maintain them. Even though they are not formally taught or assessed, anyone who does not meet these standards quickly finds themselves at a disadvantage. There is also an equity issue in terms of who pays for the devices that learners use. Most schools now have a 'bring your own device' (BYOD) policy that shifts responsibility and costs for these devices to the learners.
- The informal curriculum of digital technology use reflects the individual perspectives and expectations of teachers and preceptors that shape and direct technology use. This may include situations where a teacher or preceptor is particularly keen on using technology in support of learning (such as where a preceptor trades tips on apps and mobile devices with their students) or is against the use of technology in learning situations (such as where a preceptor forbids the use of mobile devices in front of their patients).

Clearly, although there may be relatively little explicit attention paid to the use of digital technology in medical education, a great deal depends on it, and medical teachers should carefully consider the different messages and expectations of technology use they and their learners are exposed to, provide guidance where

necessary, and identify and address equity issues appropriately.

Dependency and digital technology

Given that digital technologies have an increasingly ambient presence in contemporary medical education, medical teachers also need to consider the ways in which they depend on digital technologies, and the consequences of these dependencies. From one perspective, we can consider what the effective use of digital technology in medical education depends on. I have illustrated this by adapting Maslow's hierarchy of human needs (Fig. 21.1).

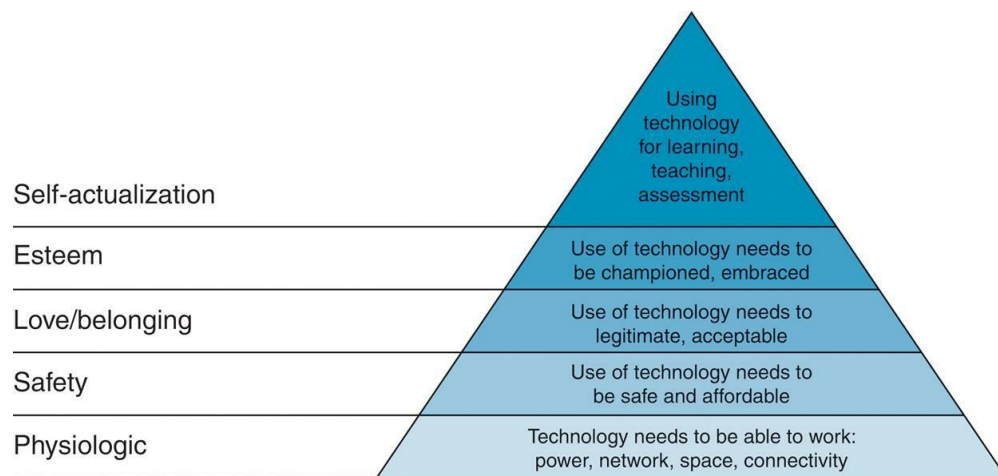


FIG. 21.1 Using technology for learning, teaching and assessment depends on underlying contextual affordances. Failures or challenges at lower levels can undermine higher levels. This helps to explain why it is that the same technology may be more or less effective or viable in different contexts.

A second perspective on dependency focuses on the extent to which technology directs and shapes what we can and cannot do, what we pay attention to and what we ignore, and what we value and do not value. For instance, most digital devices (laptops, smartphones, tablets, etc.) are designed for one person to use them at a time. This means that these technologies constrain and shape how their users interact and how they work with and around these technologies. For example, groups of people tapping away at their personal devices rather than talking to each other is a growing cliché of this modern age. Sociomaterialist theories of technology use, such as 'activity theory' (Engeström et al., 1999), reflect this shaping and mediating perspective, as does affordance theory (the range of actions that learners' and teachers' perceive as available to them when using different technologies).

A third perspective on dependency reflects the risks and liabilities associated with using digital technologies in medical education. For instance, data security and confidentiality have become critical issues for all organizations, with more and more resources required to protect against attacks and breaches. Even if system integrity is maintained, there are still risks related to the extent to which key events or activities

depend on a given technology working. For example, moves to using online assessment have been somewhat limited by network and platform limitations. Paper-based examinations, despite being slower and more expensive to run, may prove to be more resilient and reliable. Medical teachers may well therefore elect to use simpler, more reliable and less dependent technologies rather than the more alluring but riskier digital tools available to them.

Finally, we can consider dependency in terms of technologies changing over time. Digital devices and tools do not last indefinitely; they are frequently updated or superseded. Medical teachers should not overcommit to or let themselves become overdependent on a particular tool or platform. Instead, they should be mindful of how they could shift their teaching between tools and platforms when the need arises, and how they can continue teaching when their tools fail or are discontinued.



"Digital devices and tools do not last indefinitely; systems and tools are in a permanent state of being updated or superseded by newer alternatives."

Digital natives

Medical teachers need to appreciate the roles and identities their learners may adopt when using digital technologies. There has been a tendency over the last decade, particularly in the media, to equate youth with greater computing skills and abilities than their seniors. Labels such as 'digital natives' or 'net generation' have become a powerful meme that has persuaded many learners and faculty ([Ellaway et al., 2015](#)). This is problematic for a number of reasons. Although some learners have certainly embraced a digital lifestyle, others have not, often for perfectly sound and defensible reasons. Any group of medical students will typically have some students who make extensive use of digital technologies and others who have little interest in using them. This asymmetry can be exacerbated by learners' generally poor assessment of their ability to use digital technologies, particularly for those who have greater confidence than competence. Teachers on the other hand may have less confidence than competence in using digital technologies in their work, and they may perceive greater risks in using technologies than their learners, and they may as a result cede control of the digital to their learners on the (perhaps mistaken) belief that they are better able to make appropriate decisions in this regard ([Beetham et al., 2009](#)).

Technology as outcome

Although most technology use in contemporary medical education is about mediating learning activities, there are some aspects of medical education that focus on preparing learners for using technology as clinicians. From this perspective, technology use can be both the medium and the objective of training activities.

Preparing for e-health

Physicians increasingly use digital technologies in their clinical practice (e-health and telemedicine in particular). Physicians therefore need to know how to use tools, such as electronic health records (EHRs) and electronic medical records (EMRs), imaging (picture archiving and communication system [PACS]), laboratories, order entry and prescribing, point of care information, decision support and guidelines, logistics (scheduling, organization, management), and digital tools for communicating with patients and colleagues. Medical applications of digital technology should be taught across the curriculum, where possible using the technologies and tools that will be used in practice. For instance, an EMR could be populated with patient cases for problem-based learning or clinical skills sessions. However, as the specifics of these technologies typically vary by context, it is usually more important to teach the principles of e-health rather than the specific operations of a particular platform or tool. While the specific e-health competencies required of graduating doctors is still debated, there are models that can be used to guide education practice (Ho et al., 2014).

Digital professionalism

The use of some tools and systems, such as social media, has allowed individuals to say or do things in public forums that impact their own reputations, as well as those of their institutions and professions. Although there have always been indiscretions in medical education, the difference with social media is that it makes these indiscretions far more public. Whereas some institutions have responded by punishing or proscribing the use of social media, others have tried to take a more positive approach.



"Digital media are not an intrinsic threat to medical professionalism. Professionals should use digital media for positive purposes in ways that support principles of patient care, compassion, altruism and trustworthiness. Professionals should be aware of the shaping nature of their relationships with digital media and they should maintain the capacity for deliberate, ethical, and accountable practice."

Ellaway et al. (2015)

There are three dimensions to what we call digital professionalism:

- Proficiency: Professionals should be able to use technology effectively and safely, without making inappropriate use of time and resources, while avoiding unnecessary risks and distractions. This includes selecting and using technologies safely and efficiently, and making appropriate use of training and support resources.
- Reputation: Digital professionals should behave appropriately and respectfully in all venues with all media at all times; they should refrain from disclosing anything in any medium that they would not be comfortable defending as appropriate in a court of law or in front of a disciplinary panel.
- Responsibility: Digital professionals are responsible for their actions; they should seek to develop and maintain positive and effective behaviours associated with using digital media. They should model positive behaviours in using digital media to others including their students, peers and patients.

Medical teachers should incorporate digital professionalism within broader professionalism training and assessment activities in the curriculum, they should clearly connect the use of technology with the principles of professionalism, and they should model good digital professionalism to their students and colleagues.

Technology as intelligence

The final broad area in which digital technologies can be used in medical education focuses on using the data generated by digital technologies used in educational activities to guide future education practices and thinking. Collectively known as 'analytics', this is enabled by our interactions with our digital technologies leaving a broad trail of data in their wake. For instance, the longitudinal microassessments that are collected and analysed to track resident performance and progression towards completing their required competency milestones, can also be analysed to consider preceptor behaviours, and other differences and variances according to location, time of day or year, and so on ([Chan et al., 2018](#)). We do not need to limit our analyses to data deliberately generated from educational activities (such as test scores or evaluations), we can consider any data for analysis that can tell us something useful about our learners. However, accessing these data can be problematic, as much of what learners do in the digital realm remains invisible to their teachers. For example, although some social media data are easily accessible (e.g., Twitter) most are not. Much as analytics shows great potential for informing educational practice, the utility of analytics is limited by data accessibility, data quality and data utility ([Ellaway et al., 2019](#)). For instance data may be compromised through inaccuracies, absences, under- or oversampling, and so on. No data are perfect, and it is important therefore that the quality of the data is well understood and any inferences drawn from the data proportional to their quality. Even if you have good data, they might not be able to tell you much. Data from educational technologies generally reflect machine-level events, primarily cursor clicks and key presses; they can tell you what happened and when it happened, but they usually cannot tell you why something happened or what educational consequences were. Education analytics is an emerging area of activity at the time of writing this chapter and it is unclear at present quite how much and in what ways this will become part of the medical education mainstream.

Another emerging and related concept to analytics is that of 'big data', the parsing of very large datasets to identify patterns and variances that can then be mapped back to phenomena that would otherwise go unnoticed. The primary challenges in big data science are the volumes of data to be parsed, the velocity at which the data are generated, the variety of different data and sources of data to be considered, and the veracity of the data available. It is unclear how much real operational utility big data will be able to afford medical education practice.

Education analytics and big data also pose a number of ethical challenges, not least of which is the extent to which they represent a surveillance culture, one where learners and teachers are constantly being tracked and evaluated on their every action. This raises many other concerns, not least of which is the opportunity this creates for inappropriate and unethical decisions to be taken on what the data seems to be showing. Thus while the ambient collection of education data could indeed be used for intelligent and beneficial purposes, it could also be used for less desirable political or ideologic purposes. It is unclear at the present time where we will draw the line in

monitoring and controlling our learners and teachers through the data they generate.

The final emerging technology that has great potential to both aid and disrupt medical education is artificial intelligence (AI), 'computer software that are designed to mimic and extend human rational thinking and actions' ([Masters, 2019](#)). AI is already being used in some aspects of medical practice in support of tasks where computers may be more accurate or less prone to mistakes than human beings. The ethics of using AI in medicine are still being debated, but their use in medicine has implications for teaching (in particular diagnostic and reasoning skills) and for the role of physicians in general. Although the use of AI in medical education is at present relatively rare and low key, the potential for intelligent agents and systems to augment teaching and learning in medicine should not be underestimated.

Summary

Medical teachers have access to an unprecedented range of educational technologies to support their teaching, and they need to be able to function in a range of different digitally enhanced environments. They need to be able to appreciate the dynamics of such environments and select those tools and processes that best meet their needs. All medical teachers are therefore to some extent medical e-teachers. This chapter has set out a series of concepts around educational activities that should allow both learners and their teachers to make much better use of their various technologies. The greatest promise of the digital may and probably should be to enhance and improve traditional models rather than to simply sweep them away. Future editions of this book will have the benefit of hindsight to validate or challenge this perspective.

References

- Beetham et al., 2009 Beetham H, McGill L, Littlejohn A. *Thriving in the 21st century: learning literacies for the digital age* Glasgow: Glasgow Caledonian University/JISC; 2009.
- Chan et al., 2018 Chan T, Sebok-Syer S, Thoma B, Wise A, Sherbino J, Pusic M. Learning analytics in medical education assessment: the past, the present, and the future. *AEM Education and Training*. 2018;2(2):178–187.
- Clark and Mayer, 2008 Clark CR, Mayer RE. *E-Learning and the science of instruction* San Francisco: Pfeiffer; 2008.
- Ellaway, 2007 Ellaway RH. Discipline based designs for learning: the example of professional and vocational education. In: Beetham H, Sharpe R, eds. *Design for learning: rethinking pedagogy for the digital age*. Routledge 2007;153–165.
- Ellaway and Bates, 2015 Ellaway RH, Bates J. Exploring patterns and pattern languages of medical education. *Medical Education (online first)*. 2015;49(12):1189–1196.
- Ellaway et al., 2015 Ellaway RH, Coral J, Topps D, Topps MH. Exploring digital professionalism. *Medical Teacher*. 2015;37(9):844–849.
- Ellaway et al., 2013 Ellaway RH, Fink P, Campbell A, Graves L. Left to their own devices: medical learners' use of mobile technologies. *Medical Teacher*. 2013;36(2):130–138.
- Ellaway et al., 2019 Ellaway RH, Topps D, Pusic M. Data, big and small: emerging challenges to medical education scholarship. *Academic Medicine*. 2019;94(1):31–36.
- Engeström et al., 1999 Engeström Y, Mietinnen R, Punamäki RL. *Perspectives on activity theory* New York NY: Cambridge University Press; 1999.
- Ho et al., 2014 Ho K, Ellaway RH, Littleford J, Hayward R, Hurley K. *eHealth competencies for postgraduate medical education: CanMEDS 2015 eHealth Expert Working Group Report* Ottawa, ON: Royal College of Physicians and Surgeons of Canada; 2014.
- Horton, 2006 Horton W. *E-Learning by design* San Francisco: Pfeiffer; 2006.
- Masters, 2019 Masters K. Artificial intelligence in medical education. *Medical Teacher*. 2019;41(9):976–980.
- Mayer, 2009 Mayer R. *Multimedia learning* 2nd Ed New York, NY: Cambridge University Press; 2009.

[Richey et al., 2011](#) Richey RC, Klein JD, Tracey MW. *The instructional design knowledgebase: theory, research, and practice* New York, NY: Routledge; 2011.

Further reading

- Ellaway and Masters, 2008 Ellaway RH, Masters K. AMEE Guide 32: e-Learning in medical education Part 1: Learning, teaching and assessment. *Medical Teacher*. 2008;30(5):455–473.
- Masters and Ellaway, 2008 Masters K, Ellaway RH. AMEE Guide 32: e-Learning in medical education Part 2: Technology, management and design. *Medical Teacher*. 2008;30(5):474–489.
- Masters et al., 2016 Masters K, Ellaway RH, Topps D, Archibald D, Hogue RJ. AMEE Guide 105: Mobile technologies in medical education. *Medical Teacher*. 2016;38(6):537–549.

SECTION 4

Curriculum Themes

OUTLINE

- 22 Relevance of Foundational Sciences to the Curriculum
- 23 Social and Behavioural Sciences in Medical School Curricula
- 24 Clinical Communication Skills
- 25 Ethics, Empathy and Attitudes
- 26 Professionalism
- 27 Medical Research (in General) and Evidence-Based Medicine
- 28 Patient Safety and Quality of Care
- 29 Medical Humanities
- 30 Integrative Medicine in the Training of Physicians
- 31 Clinical Reasoning
- 32 Medical Education in an Era of Ubiquitous Information

Relevance of Foundational Sciences to the Curriculum

Wojciech Pawlina and Nirusha Lachman

Trends

- Frame classroom and laboratory activities in the foundational science curriculum around 'real-life' clinical contexts to promote authentic learning.
- Foundational sciences should be presented as a dynamic tool inclusive of nontechnical skills within team-based environment for solving real-life clinical problems.
- Students should maintain ownership of their own learning while maintaining partnership with a diverse teaching faculty to guide learning towards successful outcomes.
- Virtual teaching platforms for foundational science delivery and assessment should be utilized within both asynchronous and synchronous learning environments.

Key concepts

- Authentic learning: teaching of relevant foundational science which mirrors the real-world applications in clinical reasoning and problem solving by translating clinical competencies into health professions curriculum ([Fincher et al., 2009](#); [Herrington et al., 2014](#)).
- Ownership for learning: students in foundational sciences should find strategies for individualization of learning; they should become lifelong learners; apprentices capable of working within interprofessional communities.
- Innovations in teaching foundational sciences: teachers should take advantage of innovative technologies that must bear relevance to clinical practice and incorporate principles of foundational sciences within integrated and often virtual environments ([Gregory et al., 2009](#)).
- Nontraditional discipline-independent skills (NTDIS): teaching of skills, such as leadership, teamwork, professionalism, problem solving, decision-making, situation-awareness, and effective communication in foundational sciences are critical to the delivery of high-quality patient care. They underpin the essence of blending clinical competencies, patient care with foundational science ([Evans & Pawlina, 2020](#)).
- Professional identity formation: this process involves the establishment of core values, moral principles and self-awareness. Transformation from the undergraduate to health profession student takes time and should be initiated during teaching of foundational sciences ([Kalet et al., 2018](#); [Pawlina, 2019](#)).

Introduction

The role of the foundational sciences and, consequently, the role of the basic science educator in the medical curriculum have undergone significant change in the context of even more dramatic changes in both healthcare delivery systems and medical education. From this argument, it has been shown that a traditional delivery of the foundational sciences no longer has a place within the medical curriculum. As medical curricula evolve, conventional courses need to adopt a new system of instruction. As our understanding of the science of learning progresses, new knowledge transforms educational strategies in foundational science. As clinical competencies adjust to the changing paradigm of healthcare delivery, integration and assessment of nontechnical skill become an essential element of early courses in the medical curriculum. As emphasis on the importance of professional identity increases in the clinical training years, foundational sciences should be capitalized on as an opportunity for initiation and early development of professional identity formation in the medical school environment.



Tip

Three tips for faculty teaching foundational sciences in medical school:

- You are NOT teaching foundational sciences to future basic scientists (... but to future physicians)
- When teaching foundational sciences you are not only teaching scientific knowledge content (... but other nontraditional discipline-independent subjects)
- Teaching foundational sciences should not be for 'breakfast' only (... but distributed/integrated as a regular 'meal' throughout the entire length of medical curriculum).

The changing medical curriculum

With the dissolution of input-based curricula that nurtured the traditional format of foundational science teaching, the challenge now lies in teaching an 'old subject in a new world'. Regarding undergraduate programmes, a multiplicity of forces have changed the roles and responsibilities of medical educators. These forces include:

- Revision of medical curricula that progressively decreases the time allotted for foundational sciences.
- Adoption of student-centred, flexible curriculum design that promotes the wellbeing of students.
- Move towards outcome-based education where the emphases are on the expecting learning outcomes and competencies.
- Increased presence of innovations and technologies with virtual mode of knowledge delivery.
- Attention to the science of healthcare delivery with an emphasis on systems engineering.
- Emphasis on clinical translational (bench-to-bedside) research.
- Emphasis on value, safety, quality and other measurable outcomes in patient care.
- Emphasis on interprofessional education in foundational sciences in which students of two or more professions learn with, from and about each other to improve collaboration and quality of care.
- Inclusion of discipline-independent subjects, such as professionalism, ethics, leadership, reflections and teamwork.

These concepts that once required a shift in paradigm, today form basic elements of a well-structured healthcare service driven curriculum.

Therefore educators must now produce scientifically competent graduates able to function as professionals in the climate change of healthcare reform. This means that they must practice evidence-based medicine, adhere to outcomes-based standards of care, translate scientific discoveries into clinical applications, work in interprofessional teams, use electronic information technology, comply with safety and quality measures and provide accessible, affordable, accountable and affable medical care ([Srinivasan et al., 2006](#)).



"Understanding the scientific foundation of medical practice and using this knowledge to inform decisions for patient care is an essential competency of a physician."

Fincher et al. (2009)

The overarching objective of a basic medical science course is to provide fundamental

scientific theories and concepts for clinical application. Traditionally, basic science subjects have included anatomy, histology, physiology, biochemistry, microbiology and pathology. The current teaching model includes genetics, cell and molecular biology, epidemiology, nutrition and energy metabolism and the science of healthcare delivery and bioinformatics. The medical curriculum has shifted from the Flexner model to an integrated model in which basic science courses are either paired with related clinical disciplines (e.g., anatomy/radiology, immunology/pathology, neuroscience/psychiatry) or taught in blocks by organ system. Blocks are coordinated by faculty from both basic science and clinical departments, ensuring that students are given early exposure to patients in a clinical setting (Gregory et al., 2009).

Basic science courses that used to focus on content knowledge are morphing to incorporate the longitudinal objectives of the medical arts. Often termed 'holistic education', this movement encourages intellectual, social, creative and emotional development alongside knowledge acquisition. Technology offers new platforms upon which to build integrative innovations, but its use comes with many challenges. In e-learning, entire curricula are accessible via electronic content management systems on websites. Disruptive change is a well-known driver for innovation (Christensen et al., 2015). For example, the Covid-19 global pandemic has driven the fastest changes to fundamental sciences curricula necessitated by social distancing measures preventing face-to-face teaching. This has led to rapid switch to virtual learning environments in almost all medical schools worldwide (Evans et al., 2020; Longhurst et al., 2020). This nonclassroom didactic setting creates a challenge for the teacher when presented with the imperative to incorporate foundational science into lessons in clinical medicine and professionalism through holistic learning. Teachers and learners alike must be flexible and adapt to this rapidly changing educational environment.

Authentic learning in foundational science courses

In educational terms 'authentic learning' refers to wide variety of pedagogic instructions and learning materials that connect what students are learning in the classroom to what is occurring in 'real life' scenarios, problems and applications which mirrors the real world of the active medical professional navigating their field (Cotofana & Lachman, 2020; Herrington et al., 2014). Early exposure in foundational sciences to authentic learning provides an opportunity for specific knowledge acquisition in a setting that requires a student to become familiar with the realities of clinical reasoning, clinical problem solving, and use of other modalities, such as clinical imaging in gross anatomy, laboratory test results in biochemistry and physiology, or interviews with affected patients in genetic courses (Pawlina & Drake, 2016). This approach also places emphasis on student's identity formation (Pawlina, 2019) and team-forward behaviours which development occurs alongside of knowledge acquisition (Yardley et al., 2013).

The active learning environment

Another didactic shift in this movement is the transition away from passive learning towards a more active learning environment. In active learning, students learn to restructure the new information and their prior knowledge into new knowledge. Among the most used formats for active learning are discussions in small groups (problem-based learning [PBL]), learning through clinical scenarios (case-based learning [CBL]), team-based learning (TBL) and learning through reflection ([Lachman & Pawlina, 2006](#)).

One of these approaches has become a commonly applied strategy in foundational sciences: PBL which shifts the emphasis from didactic instruction to self-directed learning. So for teachers with more experience in traditional education, the implementation of PBL requires not only a change in mindset, but also major adjustments in preparation to teach in this programme. The PBL approach is labour intensive, demanding more time for preliminary work to integrate appropriate skills and knowledge within the programme.

To facilitate student-centred learning, the TBL approach supports small-group activities where students teach one another. TBL was designed for use in large classrooms, and so TBL is often used in undergraduate courses, such as anatomy, histology and microbiology during medical training. There is evidence that TBL has the ability to balance cognitive skills through group interaction of factual assimilation and application ([Michaelsen et al., 2008](#)). Because this type of strategy requires a small-group set-up and is highly collaborative in nature, teachers must master group facilitator skills while serving as content experts. Rather than lecturing, teachers debrief on the problems presented during TBL sessions ([Michaelsen et al., 2008](#)). The TBL approach can also be created in the virtual learning environment, in which small-group student activities are assigned to virtual chat rooms with facilitator log in and out for monitoring learning engagement. Although this level of interaction usually requires more in-depth understanding of the subject material by the facilitator, it also promotes more critical thinking and reflection.

CBL is learning stimulated by active discussion on clinical cases specifically constructed to emphasize foundational science principles. Cases should portray authentic, often complex, problems resolved by applying foundational science knowledge and critical analysis. Independently or in extracurricular study groups, students review the case ahead of the CBL session to identify and research the critical concept. During the CBL session, a facilitator advances learning objectives by asking a sequence of trigger questions that stimulate students to articulate their perspective: proposing problem-solving strategies, actively listening to group discussion and promoting reflection ([Bowe et al., 2009](#)). The multidisciplinary foundational and clinical science faculty collaboration may enhance the outcomes of CBL sessions.

As coaches and facilitators instead of lecturers, teachers still manage the overall instructional process in which students have the opportunity to master course objectives and solve problems. As teachers continue to learn alongside their students,

they serve as role models of lifelong learning. In addition, mentorship may develop among teachers and students that self-select to serve as teaching assistants. In these apprenticeships, students find themselves on the way to becoming colleagues of their teachers, capable of working in effective, self-managed interprofessional teams and moving education forward.

Use of reflective practice, critical thinking and clinical reasoning

The use of reflection as a practical tool has become an important component of curriculum design for foundational science. Reflective exercises support the practice of critical thinking for problem solving and the development of humanistic qualities desired in healthcare practitioners. In addition, reflective essays have been used to longitudinally monitor development of professional identity in of students in the foundational science courses ([Kalet et al., 2018](#); [Abrams et al., 2021](#)).

Within the learning environment, students may reflect individually through writing, or they may engage a team to explore or share experiences that lead to better comprehension and understanding. Reflection involves the synthesis of fragmented lessons, integration into one's personal experience, and application to the larger narrative in which students find themselves in the world. In this process, students cease to be educational automatons and develop personal epistemological initiative based on their values, which usually champion knowledge as a form of progress. From a theoretical standpoint, a student reflects by making an association with the learning objective, integrating the new concept with prior knowledge, validating the knowledge and, finally, applying the material ([Lachman & Pawlina, 2006](#)).

In designing a curriculum to include critical thinking through reflective exercises, it is important to leave the course methods open to challenge and review. Explicit training in clinical reasoning naturally begins with the foundational science courses, as it is important for the development of a systematic and efficient approach to clinical cases. This foundation serves medical trainees well indeed in all subsequent educational endeavours to come ([Elizondo-Omaña et al., 2010](#)). It entails bridging the gap between theory and practice, a chasm that can be crossed through reflection.

The implementation of reflective exercises may be achieved through the application of various techniques and learning activities. An effective way of teaching critical thinking and reflection in foundational sciences is to encourage self-directed learning. Again, in this setting, the educator takes on the role of a facilitator rather than a director of knowledge. When assigned tasks that require investigation outside of the classroom, the student must reflect on the information given and decide upon a relevant interpretation of core objectives for the subject to be mastered. Critical thinking skills are further enhanced through collaboration and team interaction. The use of teamwork to facilitate conceptual understanding has proved to be effective in stimulating collective thinking. In many cases, this can be accomplished by using e-learning technologies.

Reflection and clinical reasoning should also be incorporated into assessment strategies. Questions may be designed for critical thinking by including clinical cases that demonstrate core foundational science concepts. Providing formative assessment allows students to monitor their own learning process. In many institutions, audience response systems are used to provide immediate feedback on individual student

performance in relation to overall performance within the group. The use of a combination of questioning styles, such as multiple-choice questions and short answer questions, promotes both discernment and writing skills. In addition, peer and self-evaluation are effective assessments of critical analysis of teamwork dynamics.



Tip

Conceptual knowledge:

- Understanding the process and concept rather than memorizing details
- Providing knowledge of resources for obtaining detailed information (e.g., finding gene structure and location on variety of genetic databases).

Applied knowledge:

- Applying content to situations that are clinically relevant
- Teaching reasoning skills through virtual patients/clinical cases
- Bridging the gap between foundational science and clinical thinking.

Innovations in teaching foundational sciences

Dramatic changes in foundational science teaching are paralleled with advances in electronic media. The development of more powerful computers (tablet and notebook computers), three-dimensional (3D) gaming and simulation, 3D printing, smartphones and mobile technologies, and high-speed wireless internet connections has allowed medical educators to incorporate high-quality imaging, animations, virtual reality interactive training modules and learning management systems into the classroom. The benefit of computer-assisted learning (CAL) is that it has great potential for enhancing knowledge acquisition as it appeals to the 21st century learner ([McNulty et al., 2009](#)). However, educators must be aware that CAL has different characteristics when compared with conventional scenarios, especially as it impacts social communication, message exchange, cognitive load and participation of the learner.

However daunting, foundational science teachers should take advantage of innovative technology. Simulation laboratories are increasingly used in teaching foundational sciences. Animal physiology laboratories have been replaced by simulation centres that use high-fidelity manikins that can demonstrate the foundational physiologic concepts, respond to pharmacologic compounds, and encourage diagnostic reasoning skills in medical students ([Rosen et al., 2009](#)).

In addition to high-fidelity simulators, educators often use simple techniques and low-fidelity physical models in teaching the foundational sciences. For instance, body painting in gross anatomy improves student knowledge of surface anatomy needed for palpation and auscultation in clinical practice. The active and kinaesthetic nature of body painting, coupled with the strong and highly memorable visual images of underlying anatomy, contribute to the success of body painting as a learning tool. The use of simple physical models to demonstrate the spatial relationship of the represented structures within the human body aids understanding of its more complex function. These simple techniques and models serve as memory aids, reduce cognitive overload, facilitate problem solving, and arouse students' enthusiasm and participation ([Chan & Cheng, 2011](#)).

The use of new techniques and tools in foundational science education is essential for the training of a medical student. Innovations must bear relevance to clinical practice and incorporate principles of functional science within integrated and practically digitized environments.

Foundational science integration throughout the curriculum

In addition to preserving prior knowledge, undergraduate students must also incorporate recent advances that occur in clinical practice and correlate their understanding through the interpretation and integration of foundational science concepts. Frequently, areas well known to the foundational scientist but rarely explored by the clinical specialist become crucial to the success of new clinical procedures. For example, the use of surgical robots and interventional procedures with minimal access surgery, as in radiofrequency ablation of cardiac arrhythmias, necessitates a solid understanding not only of detailed anatomic relationships within the heart but also of the heart's electrophysiology. Detail once considered extraneous has renewed significance and is often critical to the success of a clinical procedure. Therefore integration of foundational sciences into the later years of the medical curriculum and, more so, in postgraduate specialization is growing in popularity. A return to the foundational sciences during the latter years of medical curriculum, when students' clinical reasoning and analytical skills are more refined, enables learners to better integrate foundational science concepts into their clinical experience ([Spencer et al., 2008](#)).

However, this also means that although modern medical education may not favour the retention of the classical foundational scientist, the success of modern medical education is thoroughly dependent on the classical details of foundational medical sciences. Basic scientists can no longer exist in isolation from clinical disciplines and need to contribute to clinical outcomes. Whereas in the past, their expertise was limited to the first few years of medical training, the new era of medicine requires the basic scientist to be engaged throughout the medical curriculum.

Nontraditional discipline-independent foundational science skills

Moving forward, with the understanding that foundational science will more likely extend throughout the curriculum ([Spencer et al., 2008](#)) foundational science courses must therefore incorporate longitudinal objectives that will be revisited in clinical courses. These may include discipline-independent subjects, such as leadership, teamwork, professionalism, effective communication ([Evans & Pawlina, 2020](#)) and promotion of students' wellbeing:

Leadership

- Skills fostered through team-based activities.
- Demonstrated by the success with which a group is able to achieve set objectives under the direction of the designated team leader ([Pawlina et al., 2006](#)).

Teamwork

- Essential part of successful patient care.
- Fosters collaboration in obtaining, sharing and presenting knowledge.
- Involves learning teams as an instructional strategy ([Michaelsen et al., 2008](#)).

Professionalism

- Entails acts of dutifulness and showing respect for others.
- Based on traditional duties and responsibilities of the profession.
- Anchored in clinical practice of medicine; also should apply to foundational sciences ([Lachman & Pawlina, 2006, 2020](#)).

Professional identity formation

- In foundational sciences this process is initiated by the transformation from the undergraduate to medical student.
- It involves the establishment of core values, moral principles and self-awareness ([Pawlina, 2019](#)).

Communication skills

- Early emphasis equips students with the ability to effectively transfer information between the members of the team and later in the patient setting ([Evans & Pawlina, 2020](#))
- Early introduction of peer and self-evaluations to enhance assessment skills ([Lachman & Pawlina, 2020](#))

Student wellbeing

- Protection of nonscheduled curricular time for self-learning, reflection and activities that promote wellbeing of learners
- Didactic review sessions and practice practical examinations using format of final examinations
- Incorporation of flexible 'consolidation days' into the course curriculum with students' self-directed activities.

Early integration of nontraditional discipline independent skills into foundational science curricula positively impacts student awareness and their ability to apply these skills later in clinical training (Heidenreich et al., 2016). Establishing good practice in discipline independent skill development involves formal assessment of these skills within a designed learning environment that provides students with opportunities to demonstrate these skills. Team-based learning environments that centre around consistent peer to peer interaction, rotational leadership roles and formal peer and self-evaluation are ideal. Providing clear objectives and expectations to students with regular feedback and teaching moments during laboratory sessions throughout the course encourages student awareness and subsequent development of nontraditional discipline independent skills

Objective assessment of nontraditional discipline independent skills is challenging because assessment is largely based on subjective evaluation. With this in mind, as students are evaluated, faculty may want to consider categorizing assessment to include: (1) cognitive skills: relating to a student's capacity to think (clinical reasoning); and (2) interpersonal skills: relating to how a student interacts with other individuals to contribute to overall team learning. To provide meaningful feedback to students in the form of quantitative assessment, faculty may consider the following:

- Faculty interaction with students during laboratory sessions should be maximized. Physically visiting workstations, posing critically thoughtful questions during tasks and guiding students through activities that are more technically challenging allow for better understanding of students' ability.
- Regular and clear communication with students during the course is key for gathering information relating to student demonstration of targeted skills. Providing on the job and one on one feedback sessions allow faculty to assess student improvement and highlight areas for improvement.
- Increased cognizance of student disposition during class allows faculty to assess academic maturity (attentiveness, focus, punctuality, interaction with team members, contribution to discussions).
- Monitoring of student progress allows faculty to identify students at risk and provide early intervention to promote student success
- Maintaining a record of student interaction, as well as student observation of good practice and insufficiencies provides data for feedback sessions.

As the current literature referenced in this section highlights the importance of nontraditional discipline independent skills in healthcare, it must be reinforced that improvement in demonstration of these skills require practice and repetition. Opportunities for integration of these skills within foundational science curricula should be identified and developed so that they may not only be meaningfully assessed and also interpreted and applied by students in a clinically meaningful way.

Learning foundational science outside curricular structure

Advances in healthcare delivery are taking place at a staggering pace. There are many examples of lessons once strictly within the domain of foundational science that are now a part of everyday clinical practice. Starting early in medical school, teaching faculty should advocate for, mentor and provide opportunities for students to be engaged in research projects that enrich their appreciation for translational research. Many schools have protected research time within the curriculum for medical students, usually dispersed among clinical clerkships. Others offer summer programmes for students who are interested in further research. In curricula without designated time for research activities, the foundational science faculty should provide opportunities for students to participate in research activities during unstructured time in the medical curriculum. Under the guidance and direction of their mentors, students may elect to conduct research within a spectrum of possible projects, including foundational science bench research, medical education research and clinical research. Extracurricular research fosters closer relationships between students and their faculty mentors, gives students the opportunity to meet distinguished visiting physicians and scientists, and allows them to gain experience in diverse laboratory and patient care settings.

These opportunities are likely to create a culture of scientific research as the students come to be clinicians ([Fincher et al., 2009](#)). If this approach generates an abundance of clinician-scientists, it will likely increase the translation of knowledge from the bench to the bedside and improve patient outcomes.

Summary

Foundational sciences should no longer be taught in the traditional manner in the medical curriculum. The design of the contemporary medical curriculum incorporates clinical and translational research, an increased presence of electronic technology, the implementation of student-centred learning, and the increased emphasis on professionalism, ethics, interprofessional teamwork and professional identity formation. Teachers should assume the roles of coaches and facilitators rather than directors within an authentic curriculum. They need to mentor students into becoming lifelong learners—apprentices on their way to becoming colleagues—capable of working within interprofessional communities. Students also need concrete knowledge of fundamental foundational science alongside its application to clinical practice, and they must appreciate the process of scientific inquiry and translation ([Fincher et al., 2009](#)) within the digitized environment of electronic medical records and resources. Furthermore, basic scientists cannot exist in isolation from the clinical disciplines and must contribute to clinical outcomes. For the basic scientist, in framing a more modern concept of medical education, it will be necessary to shift the paradigm of tradition passed down over the centuries and integrate the foundations into clinical practice. Basic scientists must remain learners in this new age of medical education and must strive to ensure that all efforts benefit their students: the future generation of healthcare providers.

References

- Abrams et al., 2021 Abrams MP, Eckert T, Topping D, Daly KD. *Reflective writing on the cadaveric dissection experience: an effective tool to assess the impact of dissection on learning of anatomy, humanism, empathy, well-being, and professional identity formation in medical students*. *Anatomical Sciences Education* 2021; (in press) <http://dx.doi.org/10.1002/ase.2025>.
- Bowe et al., 2009 Bowe CM, Voss J, Aretz TH. Case method teaching: an effective approach to integrate the basic and clinical sciences in the preclinical medical curriculum. *Medical Teacher*. 2009;31(9):834–841.
- Chan and Cheng, 2011 Chan LK, Cheng MM. An analysis of the educational value of low-fidelity anatomy models as external representations. *Anatomical Sciences Education*. 2011;4(5):256–263.
- Christensen et al., 2015 Christensen CM, Raynor ME, McDonald R. What is disruptive innovation?. *Harvard Business Review*. 2015;93(12):44–53.
- Cotofana and Lachman, 2020 Cotofana S, Lachman N. The superficial face dissection as an example for integrating clinical approaches, authentic learning, and changing perspectives in anatomy dissection. *Anatomical Sciences Education*. 2020;13(1):117–121.
- Elizondo-Omaña et al., 2010 Elizondo-Omaña RE, Morales-Gómez JA, Morquecho-Espinoza O, et al. Teaching skills to promote clinical reasoning in early basic science courses. *Anatomical Sciences Education*. 2010;3(5):267–271.
- Evans et al., 2020 Evans DJR, Bay BH, Wilson TD, Smith CF, Lachman N, Pawlina W. Going virtual to support anatomy education: a stopgap in the midst of the Covid-19 pandemic. *Anatomical Sciences Education*. 2020;13(3):279–283.
- Evans and Pawlina, 2020 Evans DJR, Pawlina W. The role of anatomists in teaching of nontraditional discipline-independent skills. In: Chan LK, Pawlina W, eds. *Teaching anatomy: a practical guide*. 2nd Ed. New York: Springer International Publishing; 2020;459–471.
- Fincher et al., 2009 Fincher RM, Wallach PM, Richardson WS. Basic science right, not basic science lite: medical education at a crossroad. *Journal of General Internal Medicine*. 2009;24(11):1255–1258.
- Gregory et al., 2009 Gregory JK, Lachman N, Camp CL, et al. Restructuring a basic science course for core competencies: an example from anatomy teaching. *Medical Teacher*. 2009;31(9):855–861.
- Heidenreich et al., 2016 Heidenreich MJ, Musonza T, Pawlina W, et al. Can

- a teaching assistant experience in a surgical anatomy course influence the learning curve for nontechnical skill development for surgical residents?. *Anatomical Sciences Education*. 2016;9(1):97–100.
- Herrington et al., 2014 Herrington J, Reeves TC, Oliver R. Authentic learning environments. In: Spector MJ, Merrill MD, Elen J, Bishop MJ, eds. *Handbook of research on educational communications and technology*. 4th Ed. New York: Springer Science+Business Media; 2014;401–412.
- Kalet et al., 2018 Kalet A, Buckvar-Keltz L, Monson V, et al. Professional identity formation in medical school: one measure reflects changes during pre-clerkship training. *MedEdPublish*. 2018;7(1):41.
- Lachman and Pawlina, 2006 Lachman N, Pawlina W. Integrating professionalism in early medical education: the theory and application of reflective practice in the anatomy curriculum. *Clinical Anatomy*. 2006;19(5):456–460.
- Lachman and Pawlina, 2020 Lachman N, Pawlina W. Peer and faculty assessment of nontraditional discipline-independent skills in gross anatomy. In: Chan LK, Pawlina W, eds. *Teaching anatomy: a practical guide*. 2nd Ed. New York: Springer International Publishing; 2020;417–430.
- [Longhurst et al., 2020](#) Longhurst GJ, Stone DM, Duloher K, et al. Strength, weakness, opportunity, threat (SWOT) analysis of the adaptations to anatomical education in the United Kingdom and Republic of Ireland in response to the Covid-19 pandemic. *Anatomical Sciences Education*. 2020;13(3):301–311.
- [McNulty et al., 2009](#) McNulty JA, Sonntag B, Sinacore JM. Evaluation of computer-aided instruction in a gross anatomy course: a six-year study. *Anatomical Sciences Education*. 2009;2(1):2–8.
- Michaelson et al., 2008 Michaelson LK, Parmelee DX, McMahon KK, Levine RE. *Team-based learning for health professions education: a guide to using small groups for improving learning* Sterling, VA: Stylus Publishing LLC; 2008.
- Pawlina, 2019 Pawlina W. Not “how should I learn?” or “how should I act?” but, “who shall I become?”: a précis on the roots of early professional identity formation in the anatomy course. *Anatomical Sciences Education*. 2019;12(5):465–467.
- [Pawlina and Drake, 2016](#) Pawlina W, Drake RL. Authentic learning in anatomy: a primer on pragmatism. *Anatomical Sciences Education*. 2016;9(1):5–7.

- [Pawlina et al., 2006](#) Pawlina W, Hromanik MJ, Milanese TR, et al. Leadership and professionalism curriculum in the gross anatomy course. *Annals of the Academy of Medicine, Singapore*. 2006;35(9):609–614.
- [Rosen et al., 2009](#) Rosen KR, McBride JM, Drake RL. The use of simulation in medical education to enhance students' understanding of basic sciences. *Medical Teacher*. 2009;31(9):842–846.
- Spencer et al., 2008 Spencer AL, Brosenitsch T, Levine AS, Kanter SL. Back to the basic sciences: an innovative approach to teaching senior medical students how best to integrate basic science and clinical medicine. *Academic Medicine*. 2008;83(7):662–669.
- [Srinivasan et al., 2006](#) Srinivasan M, Keenan CR, Yager J. Visualizing the future: technology competency development in clinical medicine and implication for medical education. *Academic Psychiatry*. 2006;30(6):480–490.
- [Yardley et al., 2013](#) Yardley S, Brosnan C, Richardson J. The consequences of authentic early experience for medical students: creation of me-tis. *Medical Education*. 2013;47(1):109–119.

Social and Behavioural Sciences in Medical School Curricula

Jeni Harden

Trends

- Social and Behavioural Sciences (SBS) are core subjects in medical education.
- Integrated curricula offer opportunities to include SBS.
- Revising curricula to include SBS may require faculty development to ensure the required expertise to design, deliver and assess SBS.

Key concepts

- Social and Behavioural Sciences (SBS): a wide range of disciplines, including sociology, anthropology, psychology and public health.
- Biopsychosocial model: recognizes the interconnection between biological, social and psychologic factors in understanding health, illness and disease.
- Structural competence: recognition of the structural determinates that underpin many aspects of health and healthcare.
- Cultural competence: recognition of and sensitivity to the sociocultural context of the patient's life, awareness of one's biases and assumptions, and a willingness to learn and redress the imbalance of power inherent in the doctor-patient relationship.

Introduction

Medicine faces significant challenges from an array of noncommunicable diseases, contributed to by increasing societal problems, including addiction, poor nutrition, obesity, violence, chronic disease, and healthcare issues of ageing populations. Medical educators must ensure that graduates are provided with the knowledge and skills required to successfully address these challenges. The majority of these problems are readily addressed by treatment and prevention strategies derived from Social and Behavioural Sciences (SBS) research. This chapter highlights key issues and offers practical guidance to those who may already include SBS in the curriculum, or are considering how best to do this. It addresses the following key questions:

- Why are SBS important in medicine?
- What should be considered core SBS content for medical education?
- Where and when should SBS be included in the medical curriculum?
- Who should be involved in developing and delivering SBS in the medical curriculum?
- How can SBS be taught and assessed to enhance students' learning?

Why are the Social and Behavioural Sciences important in medicine?



"There are a number of compelling reasons for all physicians to possess knowledge and skill in the behavioural and social sciences."

Cuff and Vaneslow, Institute of Medicine (2004)

The importance of social and behavioural factors in the aetiology of medical disorders is well established. Research worldwide consistently shows that illnesses subject to social and behavioural influence cover the entire medical spectrum and include communicable diseases, as well as noncommunicable diseases (NCDs). A significant challenge is the array of NCDs that are the leading causes of mortality worldwide, causing more deaths than all other causes combined, striking hardest at the world's low- and middle-income populations. These diseases are especially challenging and of epidemic proportions in some countries, yet they could be significantly reduced, saving millions of lives, through reductions of their social and behavioural risk factors, early detection, and timely prevention ([World Health Organization \[WHO\], 2010](#)).

This mounting body of research on social and behavioural determinants of health has prompted calls for reforms in medical education to properly equip graduates with the skills to address these new health challenges, to identify societal and behavioural factors that caused them or impeded their treatment, and develop strategies for successful intervention or prevention ([AAMC, 2011](#); [Frenk et al., 2010](#)). Thus medical education requires the inclusion of the social and behavioural sciences, providing a foundation for more efficacious, comprehensive, and integrated biopsychosocial clinical care. The relevance of SBS is also increasingly reflected in regulatory frameworks. Within the United Kingdom, the General Medical Council's statement of outcomes for graduates includes SBS as a requirement for medical schools, while in the United States, SBS are required portions of the Medical College Admission Test (MCAT) and the accreditation standards for the Licensing Committee on Medical Education (LCME), the accreditation body for MD degree programmes in the United States. As countries adopt accreditation standards comparable with the World Federation for Medical Education (WFME) or the LCME, instruction in SBS will be an accreditation requirement ([Table 23.1](#)).

Table 23.1 World Federation for Medical Education: global standards for quality improvement

| |
|---|
| Medical School Accreditation: Social and Behavioral Sciences |
| World Federation for Medical Education: Global Standards for Quality Improvement (2015) |
| 2.4 Behavioral and Social Sciences, Medical Ethics and Jurisprudence |
| Basic standards: |

| |
|---|
| The medical school must |
| <ul style="list-style-type: none"> • in the curriculum identify and incorporate the contributions of the: <ul style="list-style-type: none"> • behavioral sciences. (B 2.4.1) • social sciences. (B 2.4.2) • medical ethics. (B 2.4.3) • medical jurisprudence. (B 2.4.4) |
| Quality development standards: |
| The medical school should <ul style="list-style-type: none"> • in the curriculum adjust and modify the contributions of the behavioral and social sciences as well as medical ethics and medical jurisprudence to <ul style="list-style-type: none"> • scientific, technological and clinical developments. (Q 2.4.1) • current and anticipated needs of the society and the health care system. (Q 2.4.2) • changing demographic and cultural contexts. (Q 2.4.3) |



"The behavioural and social sciences, medical ethics and medical jurisprudence would provide the knowledge, concepts, methods, skills and attitudes necessary for understanding socioeconomic, demographic and cultural determinants of causes, distribution and consequences of health problems, as well as knowledge about the national healthcare system and patients' rights. This would enable analysis of health needs of the community and society, effective communication, clinical decision making and ethical practices."

World Federation for Medical Education (2015)

The challenge for medical educators has been to move from a curriculum focused on the traditional biomedical model which, as the name implies, focused solely on biological determinants, to one that also incorporates SBS. The biopsychosocial model (Engel, 1977) has called attention to the importance of social and behavioural factors, conceptualized as a hierarchy of multiple biological and psychosocial determinants of disease and resultant illness processes. However, as originally conceived, it did not address the mechanisms by which biological and SBS processes interacted. Subsequent advances in multidisciplinary research clearly established bidirectional interdependencies between biological and social-behavioural processes, leading to a more advanced biopsychosocial model which emphasizes the importance of integrating the biological and the social and behavioural sciences, and the necessity for clearly illuminating the complex mechanisms by which these aetiological processes interact and affect health and disease (Carr, 1998). Increasing recognition has also been given to the importance of incorporating an awareness and understanding of the structural forces that shape health and healthcare into medical curricula (Metzl & Hansen, 2014).

What topics should be included in the curriculum?

Key institutions (Institute of Medicine, [[Cuff & Vaneslow 2004](#)]; [BeSST, 2010, 2015](#); [PHEMS, 2019](#)) have identified core SBS curricular content and learning outcomes which include the following major topics:

Social and cultural determinants of health, illness and disease

To provide appropriate care to patients from diverse backgrounds, and at different stages in their lifespan, prospective physicians need to understand the way health and illness is shaped by social factors. It is well established that morbidity, mortality and disability rates are linked to such factors as gender, ethnicity, race, cultural identity, education, income, occupation, economic and political systems, healthcare systems and many more. Students should be aware of the profound influence that these have on patients' health practices and outcomes. To facilitate this, medical curricula should ensure there are opportunities for students to develop their cultural and structural competencies ([Kumagi & Lyson, 2009](#); [Metzl & Hansen, 2014](#)).

Cultural competency refers to a critical way of thinking about health, illness and healthcare that recognizes the sociocultural influences on the lives of both patients and doctors. Prospective physicians must develop structural competency, that is understanding of the influence of structural factors (economic, political, organizational) on patients' health and healthcare and on their work as physicians. This includes aspects of living conditions, environments, occupations, income, adequacy of diet, and access to healthcare resources that are determined by public policy and economic conditions that significantly influence individual choices regarding health behaviours and healthcare decisions. Accessibility to healthcare depends upon the financial resources of the patient, public resources made available by national healthcare systems and policies, insurance carriers, or combinations thereof. Therefore appropriate treatment planning must involve an appreciation of the financial and political constraints, as well as the social and cultural limitations, imposed upon the patient and the physician. In addition, the physician must be knowledgeable about the complexities of both the formal and informal indigenous healthcare system and how they influence the accessibility of healthcare for the patient. With regards to both cultural and structural competency, students should also be encouraged to adopt humility in their learning and practice, being aware of the limitations of their understanding of patients' lives.

Patient perspectives and behaviours

Physicians can potentially be effective in helping patients to change unhealthy

behaviours (e.g., smoking, diet, stressful lifestyle). Training in important basic principles from psychology and sociology, such as structural and cultural competency, and stages of change model are essential for effectively working with patients towards improving health-related behaviour. The Stages of Change Model ([Prochaska & Prochaska, 2011](#)) outlines progressive stepwise strategies for addressing barriers to change to more effectively enable patients to adhere to diets, seek preventive healthcare, such as breast cancer screening, reduce alcohol consumption, and adhere to medication regimens. A strong foundation in such basic principles is essential to provide awareness of both the individual and social factors that influence patient behaviour and should underpin instruction and experience with techniques, such as motivational interviewing ([Miller & Rose, 2009](#)).



Tip

Training in motivational interviewing skills should ensure that students develop an awareness of sociocultural, structural and individual barriers to change.

Experiences of illness

Students should be aware of the potential disruption that illness can cause for all aspects of life (including work, family and relationships) and to the patient's sense of identity. Teaching students how to access and understand patients' illness narratives (the way patients make sense of illness onset and its impact) is essential both to the moral exercise of medicine, in ensuring that patients are listened to, but also has direct clinical relevance in developing accurate diagnoses and optimal treatment plans.



"It is clinically useful to learn how to interpret the patient's and family's perspective on illness. Indeed the interpretation of narratives of illness experience...is a core task in the work of doctoring, although the skill has atrophied in biomedical training."

Kleinman (1988)

Physician_patient interactions

The quality and quantity of information required to correctly diagnose and appropriately treat the patient is dependent upon the interaction between physician and patient. Students must learn to not only inquire comfortably about patient's biomedical aetiology but also about their personal and social concerns, emotions and behaviours. Students must develop skills that promote respectful and compassionate communication, and demonstrate an appreciation for patients' understanding of, and expertise in living with their condition, and their expectations regarding medical care.

Productive physician-patient interactions are based on the ability to establish rapport and build trust through empathic listening, elicit adequate information while at the same time understanding and addressing patient concerns, and facilitating patient involvement in a mutual exchange of information and shared decision making.

Physician role and behaviour

SBS curricula can encourage students to reflect on the meanings of professionalism. Students must develop an awareness of how their personal values, attitudes, biases, and their own health and wellbeing can influence their care of the patient. Students should learn that physicians' social accountability and responsibility extends beyond the individual patient. They must have experience and training in working in integrated interdisciplinary healthcare teams in clinics and hospitals, and develop the interpersonal and administrative skills required to work effectively within organizations and the community at large.



Tip

SBS topics offer opportunities to facilitate students' awareness of their wider roles and address the potential impact of their own values and beliefs on practice.

The intersection of the biological and the social

The optimal curricula will encourage students to recognize the intersection of the biological and the social in all aspects of patient care. Curricula should familiarize students with the physiologic mechanisms by which environmental, psychologic, behavioural, developmental, and sociocultural stressor conditions alter physiology. This should include the mechanisms by which epigenetic factors impact gene expression, how such factors interact with and affect developmental processes, and how they contribute to chronic medical problems, like chronic pain, and somatization.

Where and when should Social and Behavioural Sciences be presented in the curriculum?

Where and when SBS should be presented depends upon the current structure of the school's curriculum and may relate to the disciplinary organization of courses within the curriculum. Three models are considered, which relate to a wider discussion of curriculum integration discussed elsewhere in this book.

Discipline-specific curricula

If the curriculum is organized along discipline-specific biomedical lines, then SBS content may be more readily presented initially as a stand-alone course in the first year, in concert with other basic science courses (e.g., microbiology, anatomy/physiology, etc.). However a disciplinary approach may reflect the 'isolation' ([Harden, 2000](#)) of SBS from other disciplines with minimal reference to what is being taught in other parts of the curriculum, making it appear to be less relevant.



Tip

The efficacy of discipline-specific courses in the curriculum depends upon the application of these same principles/techniques in subsequent clinical courses.

If the curriculum and faculty fail to reinforce the SBS clinical applications in other subsequent courses and clinics, students will conclude that SBS is of limited relevance to medicine, and SBS training will have little lasting impact.

Multidisciplinary

It is also possible to adopt a multidisciplinary curricular design where SBS has allotted time within a course to address its particular take on the theme or topic being discussed. This may be likened to the 'sharing' model of integration ([Harden, 2000](#)). SBS content can be presented within the context of clinical case studies, standardized patient experiences, team-based learning, or clinical rounds. Problem-based learning courses can also offer opportunities for a multidisciplinary integration of SBS and basic science content. This approach familiarizes the student with the comparative contribution of SBS and biomedical approaches, although it may not necessarily explain the mechanisms of their interaction. Also because there is competition for curricular time within the multidisciplinary model, instructors must ensure that SBS content is adequately presented.

Interdisciplinary

A development on the discussed method is the interdisciplinary approach where SBS is integrated as part of a holistic curriculum design in which disciplinary labels disappear. Often utilizing case-based learning, cases are discussed within the context of the interdependency of the various aetiological factors, the mechanisms of their interaction, and the application of this knowledge to the selection of appropriate combined biobehavioural interventions in their treatment. Again, the efficacy of any inclusion of SBS in the curriculum requires continuous subsequent review of SBS factors throughout the curriculum. Interdisciplinary integration may present challenges for curriculum development in relation to identifying where and when SBS content is being included, with the risk of it being 'everywhere but nowhere' (Collett et al., 2016). For example, the interdisciplinary approach may offer limited opportunities for students to develop understanding of core SBS conceptual tools that would be offered in stand-alone courses. Therefore medical educators must ensure that foundational tools are taught early in the curriculum sequence.



Tip

Effective SBS integration is challenging, and it may be useful for schools/educators considering this to review the experiences of other medical schools by linking to a relevant community of practice, for example Behavioural and Social Sciences Teaching in Medicine (www.besst.info)

Who should do Social and Behavioural Sciences teaching design and delivery?

Although all medical school faculty members should optimally possess training and clinical experience in biopsychosocial medicine and should be familiar with the current conceptual and empirical research on SBS factors in medicine, such expectations may not be realistic. The potential for conflict between clinicians and SBS specialists arising from the different world views can present challenges for them to work together (Satterfield et al., 2004). However, combining SBS specialists who possess experience and/or research backgrounds in selected medical areas, with clinicians in those same areas (a 'dynamic duo' teaching team), has been shown to be effective, especially as they work together and integrate their knowledge in the course of teaching students. For example in Japan, anthropologists and clinicians have held case conferences to jointly develop cases that can be used for teaching.

Integrating SBS into the curriculum requires a clear and detailed plan for:

1. Bringing together a carefully selected group of appropriately trained and experienced faculty, committed to developing an innovative integrated curriculum.
2. Educating other faculty through continuing education programmes.
3. Recruiting new faculty with a demonstrated biopsychosocial orientation, experience and expertise.
4. Mentoring students who will themselves become experienced biopsychosocial clinicians and teachers.

How can Social and Behavioural Sciences be learnt, taught, and assessed?

Developments in medical education present opportunities for innovative approaches to students' learning including problem-based learning; case-based learning; team-based learning; blended learning; flipped classrooms, and community-based learning. Such approaches are discussed in detail elsewhere, including the relevant chapters of this book, and so will not be described here. This section presents 'top tips' that address pertinent issues to consider, together with practical advice and examples for teaching SBS within a medical school curriculum.

1 Encourage active learning

Like all subjects in the curriculum, SBS subjects are best learnt through students' active involvement in discussing, reading, thinking about, researching, and applying knowledge.

Example: Students can be asked to identify a clinical concern based on the topic area being addressed. Working in small groups they develop a 'problem tree' ([Snowdon et al., 2008](#)) to establish the SBS causes of the problem (roots) and its effects (branches). Based on this, the students can then identify potential solutions relating to specific aspects of the causes (roots). This is a useful exercise in encouraging students to not only identify SBS influences on clinical problems, but also to discuss the challenges of developing interventions to bring about change.

2 Ensure learning opportunities provide added value

Consider how best to use the contact time with students and whether 'being there' is worth it for the student.

Example: If a 1-hour class is allocated to addressing the topic of health inequalities, it is important to ask whether some of the knowledge you want to impart can be acquired in other ways. For example, it may be more useful to provide a brief summary (in note form or as a short video) of statistical evidence of health inequalities for students to read/watch before the class. This approach, drawing on the idea of the flipped classroom where some instruction is transferred from the class into individual learning time, allows the lecture time to be used to provide learning experiences that could not be achieved without being present in class. For example, lecture time could be used for a question and answer session with a panel of community experts working in the field of health inequalities.

3 Connect to the real world

In presenting SBS concepts to medical students, it is important to focus upon the medical relevance and clinical application of concepts. This can be achieved through the

use of examples, including case presentations, research findings, patients' or clinicians' experiences.

Example: Community-based learning can be appropriate for connecting students' learning to real-life contexts, for example, in schools, charitable organizations and nursing homes. It is also important to ground class-based work in real examples. For example, when discussing young people's experiences of illness, it is useful to present short video interviews with teenage patients (see the online resource www.healthhalkonline.org) and ask students to consider the challenges illness may present at this stage in life and the implications for medication adherence.

4 Be realistic about time

Medical students must constantly balance the conflicting demands of studying with other commitments. Thus in planning training experiences, it is important to work with the students, keeping their learning stage, level of experience, and demands on their time in mind. This requires an accurate assessment of the time required to complete the assigned SBS work (contact time, independent study and assessment) for the course.

Example: Students are allocated 3 hours study preparation for a case tutorial discussing Anna, a 28-year-old woman, whose mother has recently been diagnosed with Huntington disease. There are a number of different perspectives to be explored, including biomedical, ethical, and SBS, that require more than 3 hours of work. Hence it is important to be clear about the objectives you want the students to achieve in their preparation for and participation in the tutorial, and to collaborate with the session organizer to ensure these objectives can be realistically achieved in the time given. If an objective is 'to be aware of relatives' reactions when a family member is diagnosed with Huntington's', it may be possible to direct students to resources that present relevant patient stories. If an objective is 'to identify factors which shape genetic testing decision making in families with Huntington disease', an appropriate (at the right level and length) academic paper may be a useful source.

5 Provide clear learning guidance

Some medical students may be new to studying independently and new to studying SBS. This presents students with challenges (particularly in year 1) in identifying what they need to know and how best to learn. Although this may be a broader concern, it is particularly an issue for SBS topics because many students may have little or no experience studying these subject areas.

Example: Provide a clear indication of what is required of students with focused learning objectives. Structure students' learning (until more experienced as independent learners and with SBS subject areas), for example, by offering guidance on how to read academic SBS papers and how to use sources to address the learning objectives. Also consider ways to provide formative guidance to students on early pieces of work. If adequate time and resources are not available to support individual feedback, feedback to the whole class following assessments can be used effectively. It is also important to consider ways to support students who may be interested in pursuing the

subjects further. For example, students can be given an annotated list of further resources (book chapters, journal articles, websites, audio/visual clips) to facilitate their investigation of the topics in more depth.

Assessment



"Medical schools should choose an appropriate assessment format for each outcome."

General Medical Council (2011)

Discussion relating to assessment methods highlights the challenges of balancing the requirements of validity, reliability and feasibility. Increasingly undergraduate medical assessment is assessed via single best answer (SBA) questions in knowledge tests and Objective Structured Clinical Examination (OSCE). Although well-written SBAs and OSCEs can be developed to assess some SBS learning objectives, it is important to consider what is being assessed, to develop appropriate modes of assessment. If students are being assessed on their ability to discuss their understanding of the complexities of an issue or on their reflective skills, free-text response questions (either in examination or in course assessments such as essays, reports, or reflective writing) are more appropriate than SBAs.

The level of integration reflected in the curriculum structures described earlier (disciplinary, multidisciplinary and interdisciplinary) will influence the modes of assessment. When delivery is integrated, it is important to ensure that SBS content is included in assessment ([Litva & Peters, 2008](#)). Consideration should be given as to how best to address SBS objectives in assessment, and the extent to which SBS concepts and information should be assessed separately or integrated with other clinical material ([Kendall et al., 2018](#)).

How do we implement a Social and Behavioural Sciences curriculum?

None of the earlier will occur and be effective without the full support of the officers and administration of the medical school (i.e., dean, executive committee, chairs of key departments, etc.) who must be informed as to the importance of the SBS in healthcare, and their inclusion in medical school curricula. Equally, it is essential to encourage 'buy in' from students. Any curricular change must therefore involve an array of complementary strategies that must be initiated simultaneously, if not in advance of, the earlier steps.

1. Identify faculty members who support SBS in the curricula. Encourage them to seek assignment to key curriculum planning committees. Encourage faculty to participate and promote interdisciplinary teaching in collaboration with other departments and disciplines.
2. Instigate a student curriculum advisory group. Working in partnership with students to develop and implement the curriculum can help to ensure student engagement.
3. Enhance research-teaching links. Encourage faculty with SBS expertise to provide examples from their research to use in teaching, for example a relevant paper, research briefing, or a podcast.
4. Communicate internal and external developments. Circulate to those in key roles, relevant research reports and proposals from governmental agencies and nongovernment organizations calling for SBS integration in medical school curricula, and calls for social and behavioural medicine clinical services in the state, region, and country.

Summary

SBS should have a core place within medical curricula to ensure that medical students acquire all the relevant skills enabling them to become effective practitioners. SBS curricular content should address: social and cultural determinants of health, illness and disease; patient perspectives and behaviours; patient experiences of illness; physician-patient interactions; physician role and behaviour; the intersection of the biological and the social. SBS should be integrated into the curriculum in a way that ensures adequate consideration is given to the relevance of SBS content throughout all stages of students' learning. Effective integration requires collaboration between clinical, SBS faculty and students, drawing on the expertise of all to ensure that SBS content design, delivery and assessment is appropriate, timely and relevant. Whether at the early stage of introducing SBS to the medical curriculum or further developing its integration, implementing an SBS curriculum requires the support of the medical school administration. Institutions whose faculty and administration have both the vision and commitment will succeed in developing and implementing a comprehensive, integrated, biopsychosocial curriculum.

References

- AAMC, 2011 AAMC. *Behavioral and Social Science foundations for future physicians Report of the Behavioral and Social Science expert panel*, 2011 Association of American Medical Colleges 2011.
- BeSST, 2010 BeSST. *A Core Curriculum for Psychology in Medical Education: a report of the BeSST Steering Group for Psychology* Behavioural and Social Science Teaching in Medicine 2010; Available at <https://www.heacademy.ac.uk/resource/core-curriculum-psychology-undergraduate-medical-education> (accessed December 2019).
- BeSST, 2015 BeSST. *A Core Curriculum for Sociology in Medical Education: A Report of the BeSST Steering Group for Sociology* Behavioural and Social Science Teaching in Medicine 2015; Available at <https://www.besst.info/publications> (accessed December 2019).
- Carr, 1998 Carr JE. The Need for an integrated science curriculum in medical education. *Teaching and Learning in Medicine*. 1998;10(1):3–7.
- Collett et al., 2016 Collett T, Brooks L, Forrest S. The history of sociology teaching in United Kingdom (UK) undergraduate medical education: an introduction and rallying call!. *MedEdPublish*. 2016;5(3):66.
- Cuff and Vaneslow, 2004 Cuff PA, Vaneslow NA. *Improving medical education: enhancing the Behavioral and Social Science content of medical school curricula* Washington, D.C: Institute of Medicine: National Academies Press; 2004.
- Engel, 1977 Engel G. The need for a new medical model: a challenge for biomedicine. *Science*. 1977;196:129–136.
- Frenk et al., 2010 Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet*. 2010;376(9756):1923–1958.
- General Medical Council, 2011 General Medical Council.(2011). *Assessment in undergraduate medicine*. Manchester, UK.
- Harden, 2000 Harden R. The integration ladder: a tool for curriculum planning and evaluation. *Medical Education*. 2000;34:551–557.
- Kendall et al., 2018 Kendall K, Collett T, de Iongh A, Forrest S, Kelly M. AMEE guide teaching sociology to undergraduate medical students AMEE Guide 122. *Medical Teacher*. 2018;40(12):1201–1207 <https://amee.org/publications/amee-guides>.

- Kleinman, 1988 Kleinman A. *Illness narratives: suffering healing and the human condition* Basic Books 1988.
- Kumagi and Lyspon, 2009 Kumagi A, Lyspon M. Beyond cultural competence: critical consciousness, social justice, and multicultural education. *Academic Medicine*. 2009;84:782–787.
- Litva and Peters, 2008 Litva A, Peters S. Exploring barriers to teaching behavioural and social sciences in medical education. *Medical Education*. 2008;42:309–314.
- Metzl and Hansen, 2014 Metzl J, Hansen H. Structural competency: theorizing a new medical engagement with stigma and inequality. *Social Science and Medicine*. 2014;103:126–133.
- Miller and Rose, 2009 Miller W, Rose G. Toward a theory of motivational interviewing. *American Psychologist*. 2009;64(6):527–537.
- Public Health Educators in Medical Schools (PHEMS) Undergraduate Public Health Curriculum for Medical Schools: A Consensus Statement, 2019 Public Health Educators in Medical Schools (PHEMS) Undergraduate Public Health Curriculum for Medical Schools: A Consensus Statement 2019
https://www.fph.org.uk/media/2685/phems-updated-consensus-statement-2019-with-foreword_final.pdf (accessed January 2020).
- Prochaska and Prochaska, 2011 Prochaska JO, Prochaska JM. Behavior change. In: Haverling A, Reilly T, eds. *Population health creating a culture of wellness*. Jones and Bartlett Learning, LLC 2011.
- Satterfield et al., 2004 Satterfield J, Mitteness L, Tervalon M, Adler N. Integrating the social and behavioural sciences in an undergraduate medical curriculum: the UCSF essential core. *Academic Medicine*. 2004;79(1):6–15.
- Snowdon et al., 2008 Snowdon W, Schultz J, Swinburn B. Problem and solution trees: a practical approach for identifying potential interventions to improve population nutrition. *Health Promotion International*. 2008;23(4):345–353.
- WHO, 2010 WHO. *Global Status Report on Noncommunicable Diseases* World Health Organization 2010.
- World Federation for Medical Education, 2015 World Federation for Medical Education, *Global Standards for Quality Improvement*, 2015
<https://wfme.org/standards/bme/> (accessed December 2019).

Further Reading

- Alder et al., 2019 Alder B, Abraham C, van Teijlingen E, Porter M.
Psychology and sociology applied to medicine 4th ed. London: Churchill-Livingston; 2019.
- Feldman and Christensen, 2019 Feldman MD, Christensen JF, eds.
Behavioral medicine: a guide to clinical practice. 5th ed New York, NY: McGraw-Hill; 2019.
- Sahler and Carr, 2012 Sahler OJ, Carr JE, eds. *The Behavioral Sciences and Health Care*. 3rd ed. Cambridge, MA: Hogrefe; 2012.
- Scambler, 2018 Scambler G, ed. *Sociology as Applied to Health and Medicine*. 7th ed. London: Palgrave; 2018.

Clinical Communication Skills

John R Skelton and Connie Wiskin

Trends

- The wider context of clinical communication merits more focus on colleague interactions; much training relates to 'doctor-patient' interaction. Post Francis Report more weight should be given to competencies, such as effective handover, situation, background, assessment, recommendation (SBAR), team relations, reporting concerns and presenting in public.
- The educator's job is to sensitize people to communication, and to give them a vocabulary to discuss it with.
- Communication is increasingly (and usefully) integrated within other areas, often as part of the individual's 'professional development'. This includes linking communication training to, for example, values and ethics.
- Communication is context specific; both spoken and written. It is therefore difficult to be prescriptive about how or when to teach it. Educators need flexibility (and creativity) in this respect.
- The emergence of a pandemic during the editing of this chapter means future endeavour is likely to include a body of critical work on remote consulting.

Key concepts

- Communication skills: an increasingly redundant concept in training. In line with developments in the field – and the refocusing of graduate outcomes across governing bodies – skills-based approaches are less than adequate. Current practice positions communication as part of professional development, with emphasis on enacting values and humanities-based approaches.
- Role play: a core, constructive approach for developing effective communication. Education through role play (healthcare simulation) is inductive in nature, allowing immersive learning in a valid context that is immediately transferable to the workplace. Done well, using trained professionals, affords the opportunity for individual feedback, growth and reflection on what it means to be a 'good' doctor.
- Nonverbal communication: Important, but not quantifiable. Gesture, eye contact, self-presentation and so forth convey a great deal (from doctors and patients) and this information should not be underestimated. However, meaning and relevance is highly context (and culture) specific. An agile approach is recommended, where cues are checked.

Introduction

The importance of clinical communication is now taken for granted. It is routinely taught and tested at undergraduate and postgraduate level in many countries. Possible rationales have been proposed, often centred on a list of 'key skills', or 'tasks', such as [Silverman et al. \(2013\)](#) and [Maguire & Pitceathly \(2002\)](#). The UK Council for Clinical Communication has published national guidelines for undergraduate curricula (most recently [Noble et al., 2018](#)), and communication themes are commonplace at international medical education forums.

The phrase 'clinical communication' is often used, rather than 'communication skills' to emphasize that communication is more than 'just' skills; it focuses on all aspects of how we present ourselves to our patients and colleagues. There have been a number of developments over the last decade to support this. Firstly, any skill is ineffective taken to the extreme. What counts as 'appropriate' eye contact, for example, is dependent on an indefinitely large set of variables (gender, age, culture, etc.). What matters therefore is being able to communicate flexibly. This may be termed a type of 'creativity' ([Salmon & Young, 2011](#)). 'Making choices' amongst a range of possibilities is, more realistically, at the heart of good communication ([Skelton, 2008](#)). On this argument, the teaching of communication is about sensitizing people to choice: however, a list of skills-as-things-to-do has a specificity which the more abstract approach (see for example, [Makoul, 2001](#)) lacks.

Secondly, the relationship between communication and broader concepts of 'professional development' has changed ([Stern & Papadakis, 2006](#)), to the extent that communication teaching may be seen as part of professional development, or a humanities-based approach. This is, at present, a difficult area however. For example, the US Medical Licensing Examination (USMLE) distinguishes 'communication and interpersonal skills' (fostering the relationship, gathering information, providing information, making decisions, supporting emotions and enabling patient behaviours) from 'professional and ethical/legal interactions'. See www.usmle.org for updates.

In addition, in the United Kingdom, the Francis Report ([Francis, 2013](#) and [National Archives 2013](#)). into the problems at one English Hospital Trust has brought the word 'culture' to the fore (as in a phrase like 'the culture of medicine'). The 2015 initiative from the General Medical Council, *Promoting Excellence*, also picks up this term, and puts together 'communication, partnership and teamwork'.

Thirdly, there is growing awareness of the many types of communication doctors need to undertake. The quasi-counselling model of face-to-face communication with patients, the staple of clinical communication courses for many years, is no longer enough on its own. Key areas are spoken communication with colleagues (leadership strategies, raising concerns, handover etc.), remote (i.e., by telephone and video) consulting – and of course academic and related reading, and writing. And in addition, there are new contexts both for communication (medical records, etc.) and teaching (hi-fidelity simulation, for example).

Everyone knows that communication matters. However, the centrepiece of most

clinical communication teaching remains doctor–patient interaction. And the central methodology continues to be role-play, ideally with an external ‘trained other’ taking the patient role. The educator’s job – using this, and other appropriate methods – is to sensitize people to it, and to give them a vocabulary to discuss it with. This is increasingly integrated within other areas, often as part of ‘professional development’.

Using role play (simulation)

Rationale

'Role play' is an unfortunate label: even in the United Kingdom, it has overtones of amateur dramatics, and in the United States, it has perhaps even less credibility. But as alternative labels (e.g., 'simulated patients') are used in different ways, we have retained the term role play to mean a serious, challenging educational activity.

The fundamental rationale for role play is that it provides a safe environment for mistakes and experimentation and can offer a relatively standardized experience (this has particular relevance for standardizing assessment).

Education through role play is inductive in nature; moving from a focus on a particular case to a discussion which seeks to induce general principles. For example, "Mr Novak responded in this way—is this typical of how people might respond in these circumstances? Are there other possibilities?" It therefore fits well with contemporary educational practice in starting with individual cases rather than lecture-based generalities. It also fits neatly into the common pattern of clinical life: contact with patients, one by one.

Formats for role play

There are unlimited variations of role play, for example:

1. Forum theatre: Role player(s) and/or facilitator act out a scenario in a less-than-perfect, but plausible, way. Facilitator subsequently invites comments from audience (or second facilitator does, with roving microphone). Repeat scenario, building in changes suggested. Draw conclusions.
2. Large group: Role player and facilitator, audience of 8 to 20. This can be done as a version of forum theatre, but the smaller group size makes it more flexible. 'Time outs' can be introduced, so that everyone present can stop, review, ask questions or make suggestions. With a group of this size, it becomes reasonable to ask participants to take the part of the doctor. Depending on levels of confidence, other participants can offer detailed advice beforehand (this shares the burden of responsibility). With a group of up to 20, it is not realistic to offer everyone a chance to role play. Notoriously, those most in need are least likely to volunteer, but it may be reasonable to allow some to take a back seat, participating in targeted observation. This means asking individuals to look for certain key elements: "How is the doctor achieving empathy?" or, at a lower level, "What type of questions is the doctor asking, and why?" Discussion often lasts longer than the role play itself, and is at least as interesting. The best role players are essentially educators, and contribute detailed, evidenced feedback about impact.
3. Small group: Role player and facilitator, group of up to eight. With this number of participants it becomes realistic to offer everyone a chance to role play, either

seeing a consultation through from beginning to end or sharing it. Educators might suggest asking colleagues, staff or volunteers to take the patient role. Where the budget does not allow for a professional role player, this is inevitable. Most people can at least play a version of themselves tolerably well ('just imagine that you personally are in this situation'). However, professionals are trained in simulation in a way that others who might 'have a go' are not.



Tip

To improve live communication, practise dialogues in imagined contexts where people meet for the first time (approaching someone famous you think you've recognized in a restaurant, asking a business director for a substantial charitable donation, explaining how to top up oil in a car over the phone.... The possibilities are endless!). Analyse what was effective, what was not effective, and why....

4. Single participant: Role player-facilitator, or role player plus facilitator, one participant. This is resource intensive but, particularly in cases of remedial support, the intensity of the contact and the possibility of detailed probing and positive change make it cost-effective, compared with, say, retaking training or suspension from service. A 2-hour session can make a real difference. And it is very likely to reveal a great deal about other areas, such as character, attitude and professional identity.

Conducting a role play session

If participants have never undertaken role play before, they may be nervous and/or sceptical. It is vital that the facilitator and role players are confident, matter of fact and serious.

This brings us to the question of feedback. At an elementary level (e.g., with junior undergraduates), there is a need for feedback centred on the basic skills/tasks: questioning styles, body language, checking of understanding, and so on. This is vital partly because it may be done poorly, but mostly so that participants are made aware of these skills and have a vocabulary to discuss them.

This is, however, basic stuff: a course in 'advanced eye contact' is hardly plausible. A value of role play is the opportunity it gives for discussion at a higher level, for reflection about oneself and others and about the profession. There is a basic hierarchy of questions, in fact (Appendix 1a), which perhaps most people use but is seldom made explicit. Level 1, clearly, deals with behavioural skills. The facilitator's role here is to ensure that the participant and observers can describe accurately what they have seen, and evidence it. Thus not: "You were very empathic" but: "When you leaned forward and murmured 'Take your time' you appeared empathic". And, moving as quickly as possible on to the next level in the hierarchy, to ensure that they can justify what was done. The third level represents the classic movement of inductive teaching: it compares

the particular instance against general patterns. A common way of linking the two is through the facilitator or one of the participants, saying: "This happens a lot; I had a patient once ..."

The higher-order questions (Appendix 1b) are invitations to reflect. "What do you make of this patient?", "What kind of person are they?" or, "What does this role play tell you about being a doctor?". Move as quickly as you can up the hierarchy of questions: the higher the level of the questions, the more interesting the session.

The wider context

Other aspects of spoken communication

Nonverbal behaviour happens alongside spoken communication and is often misunderstood. As [Henry et al. \(2011\)](#) point out, studies typically focus on controlled rather than naturally occurring language. This makes findings dubious; indeed, wild claims are sometimes still made for nonverbal communication (e.g., that it accounts for 90% of meaning) and are usually based on a misunderstanding of experiments in a controlled environment from the late 1960s, and perhaps also on a misunderstanding of the role of intonation. The idea is evident nonsense (if you disagree, explain why, without using words: see Max Atkinson's blog for details; <http://maxatkinson.blogspot.co.uk/>).

As regards intonation, any actor or any linguist will tell you that the same words can be used to empathize, wheedle, threaten, cajole, terrify depending on how they are said, by whom and in what circumstances. To reflect on body-language video yourself (do not worry—no-one looks quite as silly as they think they do when they first see themselves). Try to monitor what you do with: your hands, your arms (how big an area do you cover with your gestures?): your gaze, your smile. Think of what you do physically to interrupt someone (Lean forward? Put your hand out? etc.)

The other side of the coin is the need for awareness of what is lost when interviews are not face to face (e.g., telephone). The picture is confused by the different goals of many such interactions. Telephone consultations are often used to triage patients into those who do and those who do not need an urgent visit. This may account at least in part for the suggestion that telephone interaction demonstrates less evidence of the traditional attributes associated with 'patient-centredness' ([Innes et al., 2006](#)). More recently, and in the light of the current 2020 COVID-19 crisis, there has been a renewed focus on video consultation ([BJGP Life, 2020](#)).

Remember the impact on the receiver of removal of visuals. You may need to be more explicit in verbal acknowledgment/validation. Phone lines can also dampen voice tone, there is a need to check whether the speakers can be overheard, and so on.

Medical records

There are demands made on doctors in this area as never before. There is a general view that electronic medical records (EMRs) have 'a positive impact on information exchange' (they help ensure the doctor asks appropriate clinical questions) but 'a negative influence on patient centredness' (their attention is on the record, not the person). Possible approaches, where a doctor is having problems in this area, are to advise separating out the consultation and the EMR more or less completely, or to build the EMR into the meeting: "Right, let me just put that into the record—I'll forget if I don't do it now....." Or to simply increase one's computer literacy.



Tip

To improve written communication practise rewriting 'poor' text more effectively. Something like an email hurriedly sent by one frustrated doctor to another ("Dear X, I saw patient PF in clinic at your insistence. PF did not know why they had been sent. I found nothing wrong and spent some time in an awkward scenario that wasted clinic time. We do not have capacity for this type of unnecessary referral. Check before you send! PF left angry. Rectify when you see them. You could have run a basic test there; I assume you have the skill for this."). Analyse what has happened. Rewrite the email.

Communication between colleagues

Handovers

This is often taught using SBAR ([NHS Institute, 2011](#)): situation, background, assessment, recommendation (SBAR was first developed in an aviation context). The idea is that the four components can be used to frame communication between colleagues and ensure key information is not missed. SBAR teaching is useful because it forms a good general template, relevant for many kinds of reporting. Regarding teaching, it lends itself to a wide variety of approaches. A paper case can be offered to a group, for example, who can be invited to agree what elements matter: that is, how to fill the SBAR template. This is obviously a good prioritization task. One of the participants can then actually report the case, perhaps under psychologic pressure (it's the middle of the night, you're on the phone, the consultant is intimidating ...). Some people have great difficulty disentangling information that matters from background noise. As a real exercise, or as a thought experiment, they can be given an impossible instruction: Here is a case. Present it in SBAR format using a maximum of 30 words. (Stress beforehand that the task is deliberately impossible, and for the purpose of raising awareness!)

Other common issues centre on aspects of teamwork, leadership and negotiation. Here there are issues of what is known as register, that is, expressing the correct level of formality and, by extension, appearing appropriately polite without being obsequious (with seniors) or patronizing (with juniors). Most TV dramas with a hospital setting show atrocious professional interaction, usually people shouting for dramatic purposes, and reworking a brief piece of dialogue is useful (copyright permitting).

Presenting

Being able to deliver a competent, impactful and confident presentation is a professional expectation. Contexts include conference presentations, lecturing, poster delivery (an increasingly popular undergraduate assessment), grand rounds and multidisciplinary team handover.

Some people find 'being the only voice in the room' difficult. This can relate to cultural perceptions of hierarchy and power. Addressing a room taps into our basic

anxieties about being judged, exposed as underprepared, or just wrong. In extreme cases, this can attract a label like performance anxiety, experienced by the opera singer who loses their voice on the big night, the athlete who underperforms on the big occasion, and so on.



Tip

To improve colleague communication practise oral presentation of a defined topic within a strict time constraint (e.g., 5 minutes on the most interesting place I have visited, a fiction book I would recommend, a new law I would make if I could make one....etc.). Deliver it to another person, or video it to self-review. Was it well timed/signposted, were key points clear, did you draw logical conclusions (and stick to task)?

For the majority however, there are accessible strategies to facilitate competent delivery. Underpreparing is ill-advised. ('Winging it' is not for everyone! You have to be skilled to do this, or train yourself to prioritize.) Overpreparing can result in a robotic delivery. Few audiences appreciate slides being merely read out. The presenter should consider what added value they bring by being in the room. The answer usually lies in their character (enthusiasm, commitment) and ability to narrate effectively, explaining key messages as relevant. Basic maxims are: headline the key point, then contextualize. Signposting ("Now, I want to look at..."). Slides: no more than one per 2 minutes of presentation. Avoid reading from notes. Hunched posture is a barrier to projection so imagine a string from the head gently pulling up; speak to the back of the room. Control interruptions: either invite them from the outset or state that there will be time at the end (if the latter make sure there is time).

To reflect on your own skills, again, try videoing yourself. Observe how you change the subject: do you say: "OK" or "Well then...". Reflect on how you introduce a topic. Do you say: "Next I want to discuss..." or "Let me turn now to..." It is useful to give short talks (informally) to peers, friends, or have a look at online videos—for example, Ted Talks. What styles work, and what styles can you imagine using yourself?

More debilitating anxiety benefits from a targeted intervention with a coach. Mindset helps (proportionality; what really is the worst that could happen?), and breathing exercises are useful to control speech and aid calmness.

A final point about control. Questions after a talk can be unpredictable. An unfair question says more about the questioner than the presenter. In all cases it is fine to acknowledge the value of an unexpected initiation and offer to follow it up if the answer is not to hand.

Communication and hi-fidelity simulation

One particularly good context for communication, particularly interprofessional communication with colleagues is hi-fidelity simulation, usually associated with the

teaching of human factors ([Leonard et al., 2004](#)). This work deals head-on with the relationship between communication and aspects of professionalism. Note that here, and in many circumstances, 'communication' is a matter of interactions lasting a few seconds, and it is important also to stress that for many nurses, for instance, a lot of the work they do is to represent themselves to patients as competent, friendly, approachable (just by saying "Good morning", for example), so that, if and when the time comes, the patient will trust them and talk to them.

This suggests that the agenda (the list of topics) for clinical communication teaching will need substantial recasting in the near future, including oral presentations, remote consulting, communication with colleagues, rich contexts, multiple people (e.g., human factors), writing tasks, such as patient records and publications, and remote consulting (telephone/video). The latter has become particularly pertinent, given an emergent pandemic at time of writing (March, 2020).

Reading and writing

'Critical reading' is a well-established concept. In general, critical reading courses (see also [Greenhalgh, 2006](#)) incorporate some aspects of 'reading skills', as the phrase is normally used. Often missing is the kind of standard reading exercise from other disciplines: exercises in skimming, reading for gist and so on. These exercises are often undertaken against the clock, for example: "Here's a *JAMA* article without its abstract. In 20 seconds, tell me what the authors acknowledge as the main shortcomings of their paper". This confirms for participants that 'good reading' can consist of things other than reading a piece intensively from beginning to end: professional life involves quick, sensible choices about what to read and at what level of detail. It also requires readers to know where they are likely to find shortcomings stated (by convention, usually early in the discussion section), and this in turn gives them an understanding of the structure of academic papers.

The core of successful teaching of academic writing is an understanding of how it's very highly conventionalized structure is put together. An activity to sensitize participants to aspects of structure is to invite them to write up an imaginary randomized controlled trial to test the hypothesis contained in a well-known proverb, such as 'a stitch in time saves nine'.

Shorter pieces of writing are best handled not in the 'writing class' but in the context of professionalism. The doctor who does not fill in handover notes or makes poor records on the ward of 'tasks to do and tasks done' is a risk to patient safety. Of slightly longer activities, key is reading and writing referral letters. Rewriting tasks work well in these areas, for example, improving a mock letter too vague or discourteous to be effective.

Language, culture and the international medical graduate

International medical graduates (IMGs), and for that matter international medical students, are likely to encounter substantial difficulties ([Whelan, 2005](#)), even when they are fluent speakers of the main local language. There are many doctors who speak

vigorous, confident South Asian, West African or other well-established (and equally good) varieties of English, say, but do not practise in their local cultures. Often, these doctors struggle with ‘communicative competence’: that is, they know the language, but cannot use it: they know the phrase “That’s wrong” and the phrase “I wonder if I could possibly disagree?” but are at risk of using them to the wrong people. Such issues can become serious everyday hurdles: “Who should I be on first name terms with?” “How should I talk to a junior nurse?”

The best advice is usually to maximize exposure to the target culture, for example, through local friends, TV and radio. In addition, listen for, make a note of and practise the words and phrases others use to make requests, offer a suggestion, ask a difficult question, and so on. (Note that the [Medical Council of Canada](#) has launched an initiative to support IMGs with communication and cultural competence.) The situation is further complicated by the existence a great many medical schools which are English-medium, to attract international students, but where neither staff nor the international students themselves may be fully fluent in English. Here the issue is in many respects like that faced by foreign language teachers, or more exactly teachers of Language for Specific Purposes, as they are known (e.g., teachers of English for Medical Purposes). See later for details.



Tip

For international doctors, especially where English (while good) may not be their first spoken language, try to read as wide a variety of things as possible—magazines, newspapers, books.... And listen to radio/watch TV (soap opera, drama, chat shows) to get a feel of social language.

Of course, the multicultural nature of many parts of the modern world is such that many doctors encounter dozens of different cultural groups in the course of a year. Learning the rules of communicative competence for all these groups would be impossible. Here and with colloquial phrases, agility, curiosity and candour go a long way (“You mentioned ‘your ticker’ just now, can I clarify I’ve understood what you mean...”).

In terms of support for the international doctor a still much recommended language textbook for those at an intermediate level of English is Glendinning 2005. The recent introduction of the Occupational English Test (OET) for international health professionals has created a need for support materials. See Virginia Allum’s publications for OET amongst other things (list at <https://www.lulu.com/spotlight/VirginiaAllum52>).

The European Association of Language Teachers in Healthcare (EALTHY) is concerned with English language support for healthcare students particularly, but not exclusively, in Europe (see website for details). There is a tradition in applied linguistics of support for reading and (especially) writing skills. In fact, most of what is known and

taught is of value to doctors in their first language as well (see [Swales & Feak, 2004](#)). There is a strong tradition in the United States of support for IMGs based on collaborations between language teachers and medical educationalists, for example [Hoekje & Tipton \(2011\)](#).

Professionalism

'Communication' is a term which, exasperatingly, can mean more or less anything. Our clothes 'communicate', as does our accent, or the architectural style of the town hall, which perhaps 'communicates' the bourgeois values of its builders. It is impossible to set precise boundaries. For example, the relationship between written communication and the intellectual ability to construct an academic argument has been hinted at earlier, as has the relationship between communicating well and taking due professional care.

The boundaries set on 'clinical communication' vary in place and time. This is particularly well illustrated in remedial support. 'Poor communication' is often cited as a cause of patient or colleague complaint, but it is often the symptom rather than the disease. Common sense suggests that the doctor who communicates bad news in a manner perceived as uncaring may actually be uncaring: or perhaps embarrassed, rather than merely poorly skilled.

'Communication' is a label that gets slapped on many of the nonclinical, professional problems that doctors encounter. Perhaps they seem to 'lack leadership qualities', meaning they don't talk much: which in turn may mean that they need to find a leadership style which allows them to be their true, quiet selves, yet carry authority, and so on.

Summary

Doctor–patient communication as a concept, and an important clinical competence, is well established. What the discipline is now engaging with however is the need to integrate with the wider issue of professional development, while retaining its identity. The fundamental educational background of the discipline, however, and particularly the fact that role-play and simulations generally are superbly flexible methodologies, mean that the discipline continues to be well placed to have its voice heard.

References

[All websites access date 27/03/20]

- BJGP Life. Video Consultations: A Guide for Practice, 2020 BJGP Life. Video Consultations: A Guide for Practice. March 2020; <https://bjgplife.com/2020/03/18/video-consultations-guide-for-practice/>.
- European Association of Language Teachers in Healthcare European Association of Language Teachers in Healthcare; <https://ealthy.com/>.
- Francis, 2013 Francis, R. (2013). Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry Executive summary.
- Greenhalgh, 2006 Greenhalgh T. *How to read a paper* 3rd ed Oxford: Blackwell; 2006; http://www.gmc.uk.org/Promoting_excellence_standards_for_medic.
- Glendinning and Holmström, 2005 Glendinning EH, Holmström BAS. *English in medicine* Cambridge: Cambridge University Press; 2005.
- Henry et al., 2011 Henry SG, Fuhrel-Forbis A, Rogers MAM, Eggly S. Association between non-verbal communication during clinical encounters and outcomes: a systematic review and meta-analysis. *Patient Education and Counselling*. 2011;86(3):297–315.
- Hoekje and Tipton, 2011 Hoekje B, Tipton S. *English language and the medical profession: instructing and assessing the communication skills of international physicians* Bingley, UK: Emerald; 2011.
- Innes et al., 2006 Innes M, Skelton J, Greenfield S. A profile of communication in primary care physician telephone consultations: application of the Roter Interaction Analysis System. *British Journal of General Practice*. 2006;56(526):363–368.
- Leonard et al., 2004 Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in providing safe care. *Quality and Safety in Healthcare*, 13. 2004;Suppl 1:i85–i90.
- Maguire and Pitceathly, 2002 Maguire P, Pitceathly C. Key communication skills and how to acquire them. *British Medical Journal*. 2002;325(7366):697–700.
- Makoul, 2001 Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. *Academic Medicine*. 2001;76(4):390–393.
- National Archives, 2013 National Archives. (2013). The Mid-Staffordshire NHS Foundation Trust Public Enquiry;

- <http://webarchive.nationalarchives.gov.uk/20150407084003/http://www.nhs.uk/institute-for-innovation-and-improvement/situation-background-assessment-recommendation-sbar/> NHS Institute for Innovation and Improvement: Situation, background, assessment, recommendation: SBAR, 2011 NHS Institute for Innovation and Improvement: Situation, background, assessment, recommendation: SBAR;
http://www.institute.nhs.uk/safer_care/safer_care/Situation_Background_Assessment_Recommendation_SBAR/ 2011.
- Medical Council of Canada Medical Council of Canada;
<http://physiciansapply.ca/orientation/about-the-communication-and-cultural-competence-program/>.
- Noble et al., 2018 Noble LM, Scott-Smith W, O'Neil B, Salisbury H. Consensus statement on an updated core communication curriculum for UK undergraduate medical education. *Patient Education and Counselling*. 2018;101(9):1712–1719.
- Salmon and Young, 2011 Salmon P, Young B. Creativity in clinical communication: from communication skills to skilled communication. *Medical Education*. 2011;45(3):217–226.
- Silverman et al., 2013 Silverman J, Kurtz S, Draper J. *Skills for communicating with patients* 3rd ed CRC Press 2013.
- Skelton, 2008 Skelton J. *Language and clinical communication: this bright Babylon* Oxford: Radcliffe; 2008.
- Stern and Papadakis, 2006 Stern DT, Papadakis M. The developing physician – becoming a professional. *New England Journal of Medicine*. 2006;355:1794–1799.
- Swales and Feak, 2004 Swales JM, Feak CB. *Academic writing for graduate students: essential tasks and skills* 2nd ed Ann Arbor: University of Michigan Press; 2004.
- USMLE (United States Medical Licensing Examination) USMLE (United States Medical Licensing Examination);
<http://www.usmle.org/pdfs/tcom.pdf>.
- Whelan, 2005 Whelan G. Commentary: Coming to America: the integration of international medical graduates into the American medical culture. *Academic Medicine*. 2005;81(2):176–178.

Appendix 1

- a. Hierarchy of question types (e.g., after a role play)
 - 1. Describing skills: Did you maintain eye contact? The right amount? How do you know?
 - 2. Justifying skills: Why did you do it that way? What if you'd done it differently?
 - 3. Generalizing skills: Are there general principles here, for example, about how to defuse aggression? ('I had a patient who ...')
- b. Higher-order questions
 - 1. Assessing people: What was the patient like? Is this typical or unusual for patients of this type, or with this problem?
 - 2. Assessing self: What kind of person are you? What did the experience tell you about, for example, your response to stress, breaking bad news ... how did it make you feel?
 - 3. Assessing the profession: In the light of this scenario, what does it mean to be a doctor? What kind of things do doctors do?

Ethics, Empathy and Attitudes

Teck Chuan Voo and Jacqueline Chin

Trends

- Integration of medical ethics education into the medical curriculum is necessary for students to engage with ethics as a core aspect of good clinical care.
- Ethics teaching has three dimensions: knowledge, habituation and action.
- Contemporary professional qualities and time-honoured virtues in medicine, such as empathy should be fostered.
- Teaching and assessment should take into account stage of student development and type of learners.
- Challenges include countering the hidden curriculum and demonstrating the effectiveness of ethics education in developing clinical ethical competence and its impact on improving patient care and outcomes.

Key concepts

- Attitude: a predisposition to evaluate or respond to a given thing or situation in a certain way. Professional moral attitudes in medicine include responding to patients in a humane way, and putting the patient's interest above one's own.
- Empathy: able to understand or consider a person's concerns, feelings, experiences, etc. from that person's perspective, and to convey that understanding back to connect with and provide care for the person.
- Ethics: determining what is right or good to do based on relevant facts, values and consequences.
- Four-principles approach: refers to the principles of beneficence, nonmaleficence, respect for autonomy and justice. In highlighting common ethical dimensions of healthcare practices, they serve as foundational principles to evaluate and deliberate on ethical issues and dilemmas in clinical care.
- Virtue: an exemplary characteristic or attribute. As an approach to medical ethics, virtue ethics focuses on development of attributes and dispositions that aim at appropriate conduct and good practices.

Introduction



Tip

Current accepted standards of medical ethics education:

- Multidisciplinary and multiprofessional
- Academically rigorous and related to research
- Fully integrated horizontally and vertically
- Focused on clearly defined outcomes
- Sound teaching methods and valid assessment

Medical ethics has seen a remarkable development in the last three decades across the globe. There is international consensus that it should be an important part of any medical curriculum ([WMA, 2005](#)).

As the field comes of age, there is now wide acceptance, firstly, that medical ethics education has to be multidisciplinary and multiprofessional. Secondly, it should be academically rigorous and, like other academic subjects that are taught in the medical curriculum, related to and strengthened by current research and ongoing debates in its field. Thirdly, ethics education must be fully integrated into the medical curriculum ([Stirrat et al., 2010](#)). Integration should be both horizontal (i.e., with the basic science and clinical teaching) and vertical (i.e., through all stages of medical school education), so that there is seamlessness between what is being taught at any given time and pertinent ethical issues, along with continuous reinforcement for professional growth.

However, medical ethics education faces pressing questions about its methods and effectiveness. Although the vast majority of medical schools teach medical ethics to some extent, there is considerable variation in terms of how it is taught, who teaches it and how frequently. These findings were reported in surveys of medical schools in the United Kingdom (see for example, [Brooks & Bell, 2017](#)) where, in spite of having a well-accepted core curriculum in medical ethics ([Stirrat et al., 2010](#)), there is wide diversity in teaching, assessment methods, staffing levels and faculty development. There is no clear and consistent picture in the current literature of the efficacy of existing forms of ethics education ([Campbell et al., 2007](#)).

This chapter illustrates the practical implementation of the current standards of medical ethics teaching, using the innovation of an integrated ethics curriculum as a case study. It also highlights the ethical values, skills and attitudes that the future practitioner must acquire through a discussion of the critical challenges facing the medical profession. To nurture the ethical doctor, ethics education must be based on clearly defined outcomes and matching assessment methods in the key areas of students' ethical development, namely knowledge, habituation and action. The success

of this endeavour lies in addressing some theoretical and practical issues with the assessment of ethics and professional attitudes.

Critical challenges



Tip

Challenges for medical ethics education

- Profound social change and the meaning of professionalism
- Global standards and cultural diversity
- Countering the hidden curriculum

Challenge 1: The changing doctor–patient relationship

In the last 20 years, international trends to privatize medicine have nurtured a ‘healthcare industry’ aimed primarily at profit. This has created role conflicts for medical practitioners who are caught between their responsibilities to patients and the notion of ‘entrepreneurship’ that encourages personal business acumen combined with loyalty to corporate employers ([Breen, 2001](#)).

Thus the search for new standards by the medical profession has to focus on those values that distinguish medicine from business, that define fiduciary responsibilities to the vulnerable sick, and that bind doctors together as a committed body of persons with judgement and stewardship of knowledge and skill ([Pellegrino, 2002](#)). To meet this challenge, medical ethics education must emphasize qualities that all patients look for in a practitioner: they seek a trustworthy advocate, committed first and foremost to patient welfare, and who is empathetic, reflective and able to face up to the complexity of the rapidly changing world of medical practice.

Today’s doctors also have to be stewards of scarce resources. They have to seek just uses of finite healthcare budgets that provide the best available healthcare for patients, balancing fee-for-service care to meet growing (and at times unrealistic) consumer demands with publicly provided healthcare. To do this, they have to create effective relationships with corporate administrators that preserve rather than absolve or diminish professional responsibility ([Breen, 2001](#)). This stewardship will also involve assessing the effectiveness of new healthcare delivery channels, including ‘disruptive’ innovations, such as telemedicine and precision medicine.



The changing doctor–patient relationship:

“Until recently, physicians generally considered themselves accountable only to themselves, to their colleagues in the medical profession and, for religious believers, to God. Nowadays they have additional accountabilities – to their patients, to third parties, such as hospitals

and managed healthcare organizations, to medical licensing and regulatory authorities, and often to courts of law."

World Medical Association (2005)

The growth of the pharmaceutical and biomedical research industries has exerted additional pressures on doctors' professionalism. As they are increasingly encouraged to help recruit patients for clinical trials, and to occupy the often uneasy role of 'clinician researchers', a whole new range of ethical skills must be learned, such as medically responsible participant enrolment in approved randomized controlled trials, and research integrity, which includes intellectual honesty (accuracy, due credit, proper disclosure) and accountability (vigilant supervision of people and funds, and safety for whistle-blowers).

Challenge 2: Cultural pluralism

Globalized societies must deal with bewildering questions about the translation of standards and ethical paradigms across diverse cultural contexts. No wholesale application of global standards, including in medicine, is appropriate.



Multiculturalism:

"The process of bridging the cultural divide does not imply uncritical acceptance of all cultural norms as being intrinsically equal, as there may not always be room for compromise. It does imply, however, that discussion about values should be open and transparent and that questions of cultural conflict arising from the inevitable collision of different paradigms of health, illness, society, law and morality should be debated in a critical and reflective manner."

Irvine et al. (2002)

One implication of this for medical ethics is that patients will differ in their beliefs concerning matters, such as human suffering and illness, obligations to others in decision making, and the extent of interventions upon nature. Today's doctors must be prepared to test their own ethical beliefs and cultural assumptions against other cultural frameworks. But how will 'ethical contours' be discerned in a world that is increasingly flattened by late capitalist imperatives of individualism, universalism, commodification and unrelenting conquest of, and dissociation from, the natural world? Some emerging considerations include greater attention to deep and longstanding cultural values that place ethically and ecologically important limits on medical interventions; the relationships of family and community in the lives of individuals and their impact on decisions; the avoidance of cultural stereotypes and genuine embrace of an ethics of virtue that commands trust and values genuine patient autonomy, as contrasted with a mere ethics of obligation that emphasizes only procedural requirements in dealing with disagreement or outright conflict of values (Irvine et al., 2002).

Challenge 3: The power of the hidden curriculum

It is well established that extracurricular factors can have harmful effects on the ethical development of medical students and junior doctors. However, there continues to be a mismatch between the pedagogic efforts of medical schools, and the challenge of reforming environments that impair ethical development (Hafferty, 2000). Although medical education professes explicit commitment to traditional values, such as altruism and compassion, the milieu in which medicine is practised may engender a tacit, nonreflective acceptance of detachment and professional self-interest instead (Coulehan & Williams, 2001). For example, other than the risk of erosion of empathy during clinical year training (Hojat et al., 2009), students may be habituated in utilizing empathy as a mere skill—rather than a set of skills, attitudes and moral concern (Jeffery, 2016)—to be performed without emotional engagement with patients. While such habituation may prevent ‘compassion fatigue’, it easily leads to a narrowing of professional identity to that of the competent technician, devaluing relationship-centred approaches to medicine.



Hidden curriculum—teaching teachers:

“Character formation cannot be evaded by medical educators. Students enter medical school with their characters partly formed. Yet, they are still malleable as they assume roles and models on the way to their formation as physicians.”

Pellegrino (2002)

How can this ‘hidden curriculum’ be countered? Part of the answer may lie in the teacher-student relationship which prefigures the student-patient relationship (Reiser, 2000). As Reiser puts it, “Students first learn about the use of authority in medicine from the faculty – how those with power and knowledge treat those who lack it.” But beyond this, as he points out, there is enormous educational potential for good or ill in the policies and pronouncements of the medical school, its traditions and ceremonies, and the atmosphere of scientific, technical and ethical commitment that its entire staff in unison with administrative personnel creates. Formal ethics training can contribute to cultural reformation by providing regular opportunities for medical students to develop emotional self-awareness and self-reflection, under the mentorship of clinical supervisors attuned to the need to balance patient connection and detachment; and encouraging critical and independent thinking by rejecting the false idea that seniority alone guarantees ethical perceptiveness and considered judgment. That is why ‘teaching the teachers’ must be an integral part of medical ethics education.



“As we expect greater professionalism from our students, we need to expect the same from teachers and organizational leaders. Anything else is disingenuous. For example,

students have every right to expect that mistreatment by residents and faculty is taken just as seriously as unprofessional behaviour on the part of students."

Stern and Papadakis (2006)

Undergraduate education

Organizing undergraduate ethics education

The nuts and bolts of setting up an undergraduate ethics curriculum are best explained with reference to a specific example, and we focus here on the Health Ethics, Law and Professionalism (HeLP) programme at the National University of Singapore's Yong Loo Lin School of Medicine.

NUS Yong Loo Lin School of Medicine

Recognizing that medical ethics is essential in achieving professionalism and excellence in patient care, the Yong Loo Lin School of Medicine (YLLSoM) established the Centre for Biomedical Ethics in 2007 whose main responsibility is to implement HeLP, a longitudinal programme integrated in the 5-year Bachelor of Medicine and Bachelor of Surgery curriculum. From setting course objectives and content to assessing student learning, a core group of bioethicists and clinicians (trained in medical ethics and/or law) designs and implements the curriculum (see [Fig. 25.1](#) for the 2019/2020 curriculum). To emphasize the clinical relevance of the HeLP curriculum, clinical educators from public and private sectors within the healthcare system hospitals and private practices are involved as lecturers and tutors throughout the longitudinal programme.

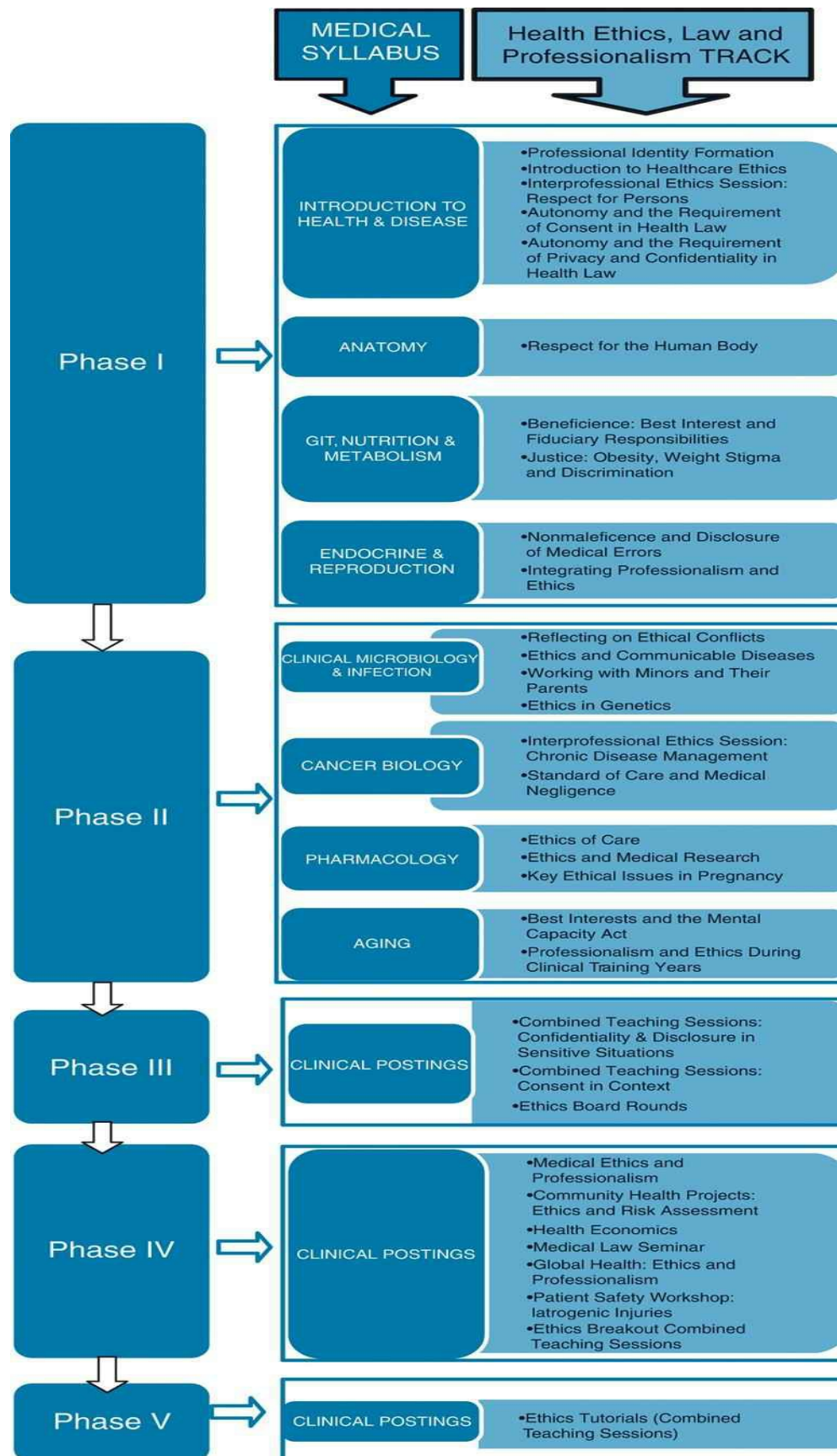


FIG. 25.1 Integration of ethics education into the medical curriculum at the National University of Singapore Yong Loo Lin School of Medicine (Academic Year 2019–2020).

HeLP aims to develop students' sensitivity to the humanistic aspects of medicine; an understanding of the doctor–patient relationship; knowledge of professional codes, ethical guidelines, laws, and regulations that underpin or frame clinical decision making; the ability to apply ethical reasoning tools and approaches, taking into account relevant facts and competing or conflicting values of a given case; and, professional attributes.

Although it is accepted that medical ethics is ultimately aimed at improving the quality of patient care, it is unclear whether the best way to achieve this aim is through character development or ensuring behavioural competencies (Carrese et al., 2015). HeLP blends the two schools of thought by specifying sets of closely related attributes or 'virtues' (honesty and integrity; responsibility and participation; respect and sensitivity; compassion and empathy) deemed essential to medical professionalism. It maps out entrustable professional activities (EPAs) for each set of attributes to form a basis of tracking and assessing curriculum outcomes and student competencies. EPAs define specific activities that students are expected to be able to perform, taking into account the amount of guidance needed at the end of each phase (i.e., academic year) of their training. For example, as an activity under the professional attribute of compassion and empathy, students should, with ample guidance, strive to understand patients' and families' physical and emotional needs at the end of both phase I and phase II, and they are entrusted, that is, expected to achieve this outcome on their own in phase IV (Table 25.1).

Table 25.1 Entrustable professional activity for compassion and empathy (professional attribute)

| Compassion and Empathy | | | |
|--|---|---|---|
| Strives to understand fellow students' needs and respond appropriately | 4 | 4 | 4 |
| Strives to understand patients' and families' physical and emotional needs | 2 | 3 | 4 |
| Strives to meet patients' and families' physical and emotional needs when appropriate | 2 | 2 | 3 |
| Reflects on observed caring attitudes towards patients in PBP ^a (as evidenced by contributions to discussion groups and reflection log) | 3 | - | - |
| Demonstrates a caring attitude towards patients (directly or as evidenced by feedback from staff and peers) | - | 3 | 4 |

Standard 1=unable to achieve outcome; 2=requires a lot of guidance to achieve outcome; 3=requires little to moderate amount of guidance to achieve outcome; 4=able to achieve outcome with no guidance (entrustment); 5=has the ability to guide/teach others.

^aPBP (patient-based programme): A programme that introduces early and meaningful patient contact to students through clinic/hospital visits, patient narratives and case-based learning, and stimulated/skills-lab training sessions.

In the preclinical years of phases I and II, emphases are placed on facilitating identity formation as students begin their journey to become medical professionals, and

promoting an understanding of pertinent bioethical concepts and principles (in particular, the four-principles approach) as they apply to the ethical, legal, and professional responsibilities of the medical student and doctor. Respect for autonomy, for example, is related to key topics such as respect for patients as persons (including on social media), medical confidentiality and patient privacy, and the best interest of the patient. Lectures are used to introduce the principles and topics in readings and face-to-face or e-lectures. Quizzes are embedded in both types of lectures to help students apply and synthesize knowledge in preparation for case-based tutorials, where they work in small groups to analyse ethical issues. Interprofessional sessions are also organized where medical, nursing and/or pharmacy students work collaboratively to consider ethical management of the needs of specific types of patients, such as those with a chronic illness, where an interprofessional, team-based perspective plays a critical role in patient welfare.

Using spiral learning that increases complexity and reinforces previous learning, the HeLP curriculum in the clinical years of phases III to V provides more in-depth analysis of various ethical, legal, and professional considerations as they arise in students' domestic and international clinical postings. (Students are also introduced to research ethics and receive ethics support as they present their community health projects, which are research projects they initiate to develop public health skills.) Integrating conceptual understanding with practical guidance, students consider common ethical issues or those that they have personally encountered in the wards, such as consent-taking, end-of-life decisions, patient safety, disclosure of medical errors, and family involvement in diagnosis/prognosis disclosure and decision-making. Consistent with the recommendation of [Stites et al. \(2018\)](#) to focus on 'action-based' pedagogy for clinical year students, HeLP directs phase III to V students to consider practical approaches to resolve ethical issues within their role and limits as medical trainees. Students learn strategies to manage emotional and moral distress, and ethical tensions and conflicts with patients and their families, fellow students and clinical staff. In addition, they learn where they can seek independent ethics advice and support, whom they should report to if they witness unethical practices, and ultimately, how they can contribute to the clinical team for the benefit of patients within their (hierarchical) learning environment.

Assessment of ethical and professional attitudes

Fitting outcomes and innovative methods

Ethics education in a medical school should aim to create a valid programme for educating and certifying graduates who are knowledgeable, ethically sensitive and reflective, and able to act with clinical ethical competence. These are key areas of a medical ethics education, the development of which can be illustrated with an ascending pyramid with specific learning outcomes and matching methods of assessment (Fig. 25.2). For example, at the YLLSoM, student assessments include multiple-choice and short-answer questions to test content understanding and application for selected HeLP topics during exams; case-based group presentations to formatively and summatively assess analysis and evaluation of appropriate responses to ethical conflicts and dilemmas; and objective structured clinical examinations to assess ethical competency in clinical scenarios using standardized patients.

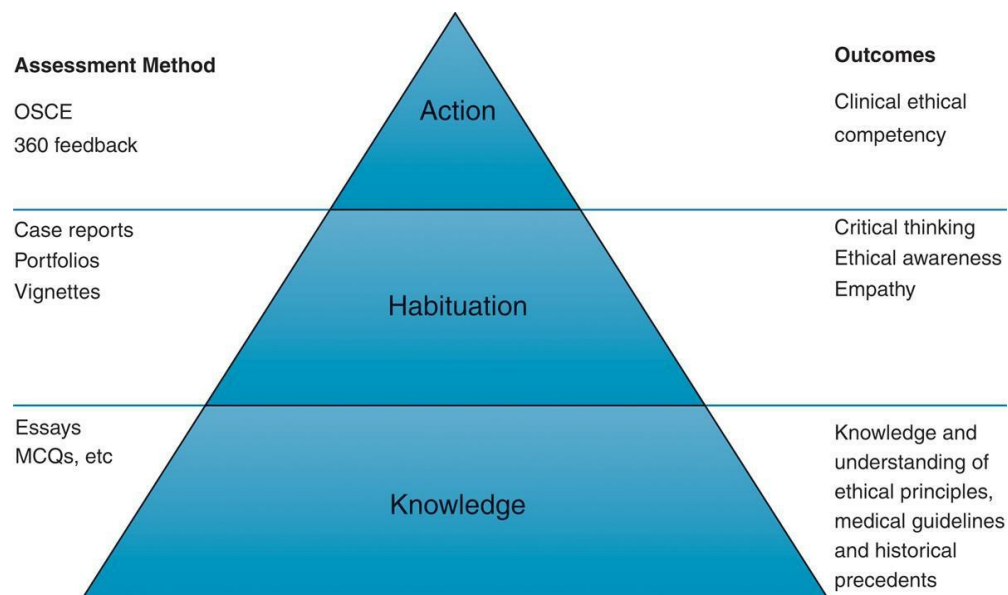


FIG. 25.2 Outcomes and assessment methods. MCQs, Multiple-choice questions; OSCE, objective structured clinical examinations.

Assessment: some difficulties

Much research is now focused on measuring medical professionalism and ethical attitudes, after a sustained period of scepticism about the possibility of making such assessments. Efforts in this field have led to better understanding of the limits of measurement (Parker, 2006), and a growing realization of the conceptual and practical issues involved in assessment (Self et al., 1992).

Firstly, an interesting study by Hodges (2006) identified four models of competence

found in competency assessments around the world: competence-as-knowledge, competence-as-performance, competence-as-reliable test score and competence-as-reflection. It discovered that overemphasis on an aspect of competency may lead to 'hidden incompetence', such as poor integration of knowledge with performance. For example, a student who had acquired knowledge competency but clearly displayed a kind of incompetence asked a patient, "Madam, do you have higher conjugated or unconjugated bilirubin?" Other types of hidden incompetencies include a performance 'checklist' mentality and lack of appropriate interpersonal behaviour, merely producing portfolios without appropriate self-awareness and remedial self-learning. Critics of the reflection model have noted that self-assessment often correlates poorly with peer assessments, as well as performance ([Hodges, 2006](#); [Kaslow et al., 2007](#)).

Secondly, there are also problems in assessment design. For example, clinical vignettes are often used to assess ethical sensitivity and reasoning, but there are unanswered questions about how these attributes can be properly measured, and whether ability to analyse cases correlates to it ([Herbert et al., 1992](#)). No obvious connection has been shown between helping students to reason things out and defend their point of view and acting in an ethically acceptable manner in the future. Indeed, increase in reasoning ability seems a minimal criterion for measuring success in ethics education: necessary, no doubt, but is it sufficient? [Goldie et al. \(2000\)](#) attempted to assess the effect of ethics teaching using an instrument he calls 'consensus professional judgement'. This was a set of vignettes in which there was a consensus on the best way of resolving a given dilemma, both from the literature and from experts who were consulted about the issues in the vignette. They were administered to measure how far ethics teaching improved the student's ability to make judgements that were consistent with what would be the judgement of the experts.

Part of the solution in addressing these difficulties is helping students to integrate knowledge, skills, dispositions, self-perceptions, motives and belief-attitudes, and fostering the capacity for reflective life-long learning ([Kaslow et al., 2007](#)).

The special nature of attitudes

Although the possibility of objective measurement of competence is highly accepted ([Stern & Papdakis, 2006](#)), it is important to note the special nature of attitudes and their evaluation. Parker points out that we can reasonably assume that students have basic attitudinal competence upon entry to medical school, but a requirement of positive demonstration of such competence across a slew of 'summative hurdles' assumes precisely the opposite! Assessment of attitudes, he argues, is rather like evaluating a person's decisional capacity, where it is up to the doctor to rebut the presumption of decision-making competence. It is easier to come to a consensus that a person lacks (falls below a certain threshold of) a capacity than that they have it, and at what precise level. In practice, this type of assessment can be done by setting clear expectations of behaviour, training teachers to deal with issues of misconduct, and providing a remedial mentoring programme ([Whiting, 2007](#)). Repeated misdemeanours, such as absenteeism, dishonesty, unreliability, disrespect or recalcitrance, should trigger a need to decide whether a student fails the ethics and professionalism course. Consensus is usually not difficult at this point ([Parker, 2006](#)).

Summary: effecting culture shift

Medical ethics education is in a progressive, exciting phase, and ideas about implementation are burgeoning. The best approach to teaching and assessing ethics and professionalism, however, remains an unresolved debate. Despite this, there is wide acceptance that ethics education should be fully integrated both horizontally and vertically with the clinical curriculum so that students can experience and appreciate the centrality of ethics to clinical practice. With profound changes to healthcare landscapes worldwide, ethics education must seek to foster contemporary professional qualities in doctors-in-training, while inculcating in them the time-honoured virtues of trustworthiness, empathy and commitment to patient welfare; expose them to the vibrant pluralism of viewpoints on the human body, relationships, life and death; and actively counter any negative influence of the hidden curriculum. Although the methods remain contentious, assessment is recognized as necessary to foster learning, enable curricular evaluation and change, and facilitate accountability for the profession and the public. For proper assessment to take place, outcomes in key ethics competencies must be specified and pursued with matching, rigorous instruments. Success in medical ethics education is measured in terms of producing reflective, responsive and self-regulating doctors. To this end, a culture shift towards concerted teaching and assessment of professional attitudes and ethical behaviour must be effected.

References

- Breen, 2001 Breen KJ. The patient–doctor relationship in the new millennium: adjusting positively to commercialism and consumerism. *Clinical Dermatology*. 2001;19(1):19–22.
- Brooks and Bell, 2017 Brooks L, Bell D. Teaching, learning and assessment of medical ethics at the UK medical schools. *Journal of Medical Ethics*. 2017;43(9):606–612.
- Campbell et al., 2007 Campbell AV, Chin J, Voo TC. How can we know that ethics education produces ethical doctors?. *Medical Teacher*. 2007;29(5):431–436.
- Carrese et al., 2015 Carrese JA, Malek J, Watson K, et al. The essential role of medical ethics education in achieving professionalism: the Romanell Report. *Academic Medicine*. 2015;90(6):744–752.
- Coulehan and Williams, 2001 Coulehan J, Williams PC. Vanquishing virtue: the impact of medical education. *Academic Medicine*. 2001;76(6):598–605.
- Goldie et al., 2000 Goldie J, Schwartz L, Morrison J. A process evaluation of medical ethics education in the first year of a new curriculum. *Medical Education*. 2000;34(6):468–473.
- Hafferty, 2000 Hafferty FW. In search of a lost cord: professionalism and medical education's hidden curriculum. In: Wear D, Bickel J, eds. *Educating for professionalism: creating a culture of humanism in medical education*. Iowa: University of Iowa Press; 2000.
- Herbert et al., 1992 Herbert PC, Meslin EM, Dunn EV. Measuring the ethical sensitivity of medical students: a study at the University of Toronto. *Journal of Medical Ethics*. 1992;18(3):142–147.
- Hodges, 2006 Hodges B. Medical education and the maintenance of incompetence. *Medical Teacher*. 2006;28(8):690–696.
- Hojat et al., 2009 Hojat M, Vergare MJ, Maxwell K, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Academic Medicine*. 2009;84(9):1182–1191.
- Irvine et al., 2002 Irvine R, McPhee J, Kerridge IH. The challenge of cultural and ethical pluralism to medical practice. *Medical Journal of Australia*. 2002;176(4):175–176.
- Jeffery, 2016 Jeffery D. Empathy, sympathy and compassion in healthcare: Is there a problem? Is there a difference? Does it matter?. *Journal of the Royal Society of Medicine*. 2016;109(12):446–452.

- Kaslow et al., 2007 Kaslow NJ, Rubin NJ, Bebeau MJ, et al. Guiding principles and recommendations for the assessment of competence. *Professional Psychology Research and Practice*. 2007;38(5):441–451.
- Parker, 2006 Parker M. Assessing professionalism: theory and practice. *Medical Teacher*. 2006;28(5):399–403.
- Pellegrino, 2002 Pellegrino ED. Professionalism, profession and the virtues of the good physician. *Mt Sinai Journal of Medicine*. 2002;69(6):378–384.
- Reiser, 2000 Reiser SJ. The moral order of the medical school. In: Wear D, Bickel J, eds. *Educating for professionalism: creating a culture of humanism in medical education*. Iowa: University of Iowa Press; 2000.
- Self et al., 1992 Self DJ, Baldwin Jr DC, Wolinsky FD. Evaluation of teaching medical ethics by an assessment of moral reasoning. *Medical Education*. 1992;26(3):178–184.
- Stern and Papadakis, 2006 Stern DT, Papadakis M. The developing physician—becoming a professional. *New England Journal of Medicine*. 2006;355:1794–1799.
- Stites et al., 2018 Stites SD, Clap J, Gallagher S, Fiester A. Moving beyond the theoretical: Medical students' desire for practical, role-specific ethics training. *American Journal of Bioethics*. 2018;9(3):154–163.
- Stirrat et al., 2010 Stirrat GM, Johnston C, Gillon R, Boyd K, Medical Education Working Group. Medical ethics and law for doctors of tomorrow: the 1998 Consensus Statement updated. *Journal of Medical Ethics*. 2010;36(1):55–60.
- Whiting, 2007 Whiting D. Inappropriate attitudes, fitness to practise and the challenges facing medical educators. *Journal of Medical Ethics*. 2007;33(11):667–670.
- WMA, 2005 WMA, World Medical Association: Medical Ethics Manual. Ferney, Voltaire, France/Online. Available at <https://www.wma.net/what-we-do/education/medical-ethics-manual/>, 2005.

Professionalism

Helen M O'Sullivan

Trends

- Interest in students' and junior doctors' professionalism online, especially on social media sites
- Increasing awareness of the cultural dimensions of professionalism
- Focus on developing and assessing emotional competence as part of professionalism

Key concepts

Hidden curriculum: the unwritten, unofficial, and often unintended lessons, values, and perspectives that students learn in clinical practice and medical school that are not part of the informal curriculum.

Digital professionalism: appropriate professional behaviour when using digital media

Programmatic assessment: a method of assessment where routine information about the learner's competence and progress is continually collected and analysed with the intention of giving the most effective feedback to the learner and allowing for high-stakes decisions at the end of a training phase.

Introduction

Medical professionalism is now widely accepted as a key part of medical education and often features directly or indirectly in the educational standards of national medical bodies. As far back as Ancient Greece, the Hippocratic Oath symbolized the regard that is paid by the medical professional to the standards that it expects of its members. However, although its importance is well understood, finding ways to integrate the development of professionalism into the curriculum and then measuring its achievement remains a challenge. It is arguably easier to identify students who exhibit unprofessional behaviour and the importance of identifying students who are not fit to practise has been in focus in recent years.

This gained even more importance when Maxine Papadakis ([Papadakis et al., 2004](#)) presented evidence of a link between unprofessional behaviour in medical school and subsequent poor performance or unethical behaviour in practice. There is a risk that professionalism is defined negatively and that the opportunity for students to develop and be assessed on positive behaviours is lost. This chapter will outline some of the ways that educators can integrate the development and assessment of professionalism into their curricula.

Defining professionalism

The first task when integrating professionalism into the curriculum is to agree on a definition acceptable to the institution that you are working in. A quick search of the literature will make it clear that professionalism has been defined in many different ways. There is still a lack of complete consensus. Within your institution, setting the values intrinsic to professionalism in the context of the changing societal pressures on medicine and healthcare in your country, culture and institution is essential. This section gives a brief roundup of the different approaches to defining professionalism but for a more complete account, see [Birden et al., 2014](#); [van Mook et al., 2009c](#) or [Koch, 2019](#).



"In simple words, professionalism means the skill, good judgement and polite behavior expected from a trained person in order to do the job well, namely good conduct."

Mahmood et al. (2015)

Public perceptions of the role of the doctor have changed. This has been reflected in an increasing focus in the media on the behaviour and role of healthcare practitioners ([van Mook et al., 2009c](#)). The rapid expansion of medical knowledge and skills, the revolution in information technology, the desire for more equal engagement between patients and healthcare practitioners, multidisciplinary teamwork and the diversity of healthcare providers in different parts of the world, all challenge the power originally held by doctors. At the same time, profound changes have taken place within the workforce itself with reduction in working hours and changes in doctors' attitudes to their vocation as more emphasis is placed on the quality of life outside work; all these impact on the original understanding of medicine as a vocation ([Cruess et al., 2016](#); [van Mook et al., 2009c](#)).

In the 1980s the American Board of Internal Medicine (ABIM) started to focus on the humanitarian aspects of a doctor's work. This resulted in *Project Professionalism* a decade later. The ABIM attempted to spell out what professionalism means to contemporary society. They identified key elements: altruism, accountability, duty, excellence, honour, integrity and respect for others ([Project Professionalism, 2002](#)). The move was influential. Medical schools became increasingly aware that professionalism should have an explicit place in the curriculum, and by 2006 most UK medical schools were reporting that professionalism was part of the curriculum ([Stephenson et al., 2006](#)).



"Unprofessional behaviours are known to be associated with impediment of communication, collaboration, information transfer and workplace relationships, poor adherence to guidelines, low staff morale and turnover, medical errors, adverse outcomes and with malpractice suits."

In 2005 the Royal College of Physicians produced a report that described the nature and role of medical professionalism at a time when the UK healthcare system was undergoing enormous change. Six major themes emerged in the report: leadership, teamworking, education, career pathways, appraisal and research. The report set the tone for UK definition and frameworks with the statement that 'Medical professionalism signifies a set of values, behaviours and relationships that underpin the trust the public has in doctors (Royal College of Physicians, 2005). Other useful frameworks from around this time were provided by Hilton and Slotnick (2005) and Arnold and Stern (2006).



"Our current understanding of professionalism is further complicated by the fact that the literature largely reflects a Western (Anglo-Saxon) notion of professionalism."

Jha et al. (2015)

However to date there is no common understanding of what the term *professionalism* actually means. The North American approach views professionalism as a mainly theoretical construct, described in abstract idealistic terms, mirroring character traits rather than observable behaviours. Common elements are altruism, respect for others, honour, integrity, ethical and moral standards, accountability, excellence and duty. These terms are easily identifiable and difficult to challenge but are not very concrete or specific. They do not translate into tangible measurable learning outcomes. In contrast, a move to frame professionalism as observable behaviours from which norms and values can be visualized stems from the Netherlands. This offers advantages for assessment (van Mook et al., 2009a). However, the complexity of the relationship between external professional behaviour and internal attitudinal values remains poorly understood. There has been some recent interest in the role that psychologic models, such as emotional intelligence might play in developing professionalism (Cherry et al., 2012; 2014; Roth et al., 2019).

Setting expectation: agreeing a framework for professionalism

Once the definition of 'professionalism' for the context of your environment has been agreed, the next step is to ensure faculty, students and other key stakeholders understand the definition and agree with it. Areas where there are differences of opinion should be highlighted at an early stage and resolved so that there is a common consensus and understanding of the values that are articulated. The exercise itself develops a sense of ownership for the integration of professionalism into the curriculum. Holding a workshop where faculty, students and junior doctors develop a shared code of conduct for everyone to abide by can help with student engagement and can also be used to call attention to faculty or clinical colleagues whose own behaviour occasionally falls short of expected standards.

It is important to pay particular attention to the professional guidelines in operation in your country, if in existence. For institutions where there is an existing framework, it is useful to have a refresher session every few years to ensure that the understanding of the professional values is still shared and agreed. At the end of this process you will almost certainly have a number of areas or domains of professionalism in which you would like your students to demonstrate a threshold standard. It is then important to set standards and generate outcomes in these domains. Some of these will be developed across the whole of the programme (such as communication or ethics) whilst others (such as adherence to code of practice, rules of confidentiality) might require competency at the programme threshold standard to be demonstrated by the end of year one.

Setting out these outcomes as clearly stated observable behaviours in a framework is essential. The institution's expectations can be made very clear to students at the beginning of the programme and provide the stimulus for students to contribute to the planning of their professional development. It enables students to understand from the beginning of their studies that the standards of behaviour expected are different to those of nonvocational students. In countries where students enrol for medical school straight from school, this expectation of high demonstrable standards of professional behaviour at all times presents a rather stark contrast to their peers on other courses. Graduates who have already had the more liberal freedom of university and hold greater life experience may well be at an advantage but there is no firm evidence to suggest this is the case. Activities at the beginning of a programme, such as lectures from senior faculty and students taking a public, professional oath of ethical conduct can help bring home the message about the behaviour that is expected.

Once definitions and standards are agreed, it is possible to review the existing learning opportunities in the curriculum and map these onto the professionalism framework. Opportunities for developing professionalism should be clearly identified and be appropriate for the stage of development of the student. There are lots of innovative ways to develop professionalism; for a review see [van Mook et al. \(2009b\)](#).

Developing a culture of professionalism: role modelling and the hidden curriculum

However professionalism is defined, the state of being a professional is conceived as a set of behaviours, values and attributes that are developed over time. Students do not simply pass a professionalism test and become a professional. Hilton and Slotnick coined the term 'proto-professionalism' to describe the lengthy state in which the learner develops the skills and experiences that they need to be a professional. They suggest that a key component of being a professional is the acquisition of *phronesis*; a practical type of wisdom that can only be gained through experience. So, while it is possible for a student to behave in a professional way, at this stage, they are proto-professionals (Hilton & Slotnick, 2005).



"To remain trustworthy, professionals must meet the obligations expected by society."

Cruess and Cruess (1997)

In discussing the development of professionalism Hilton and Slotnick developed a model (Fig. 26.1).

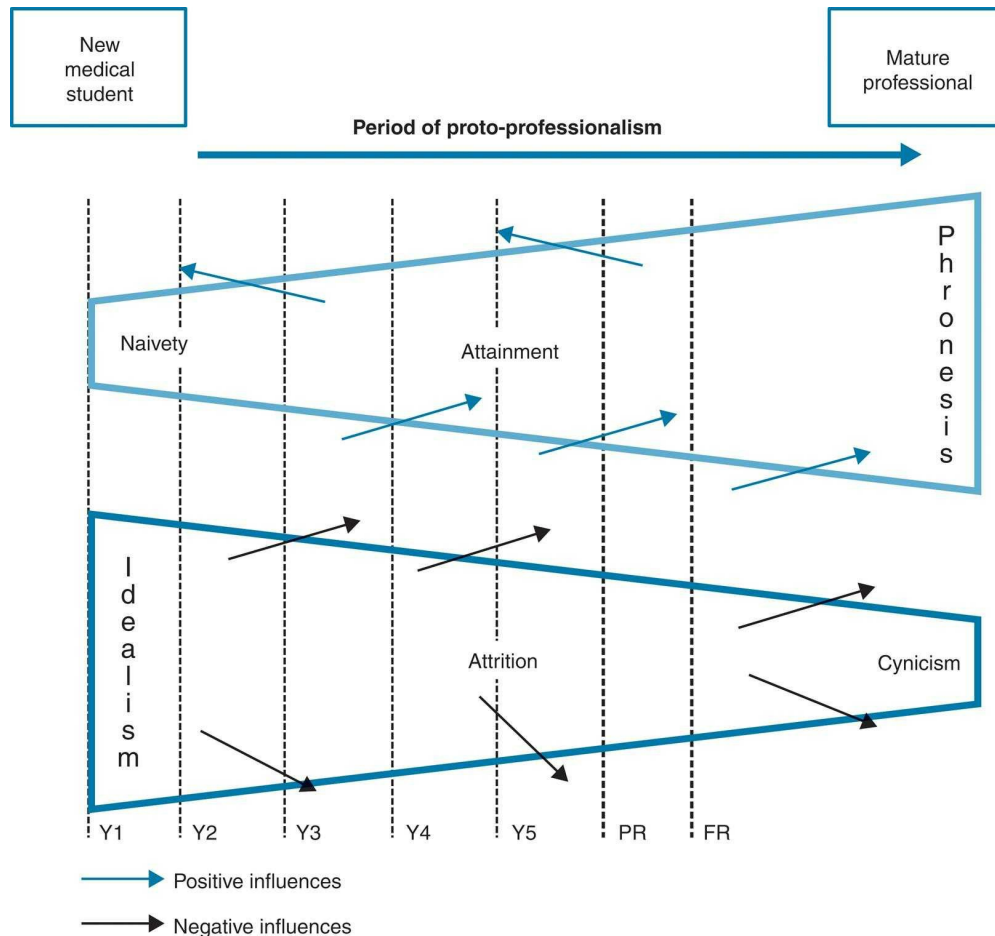


FIG. 26.1 Proto-professionalism. (From Hilton & Slotnick, 2005. With permission.)

In this model there are two types of forces that influence the development of the proto-professional. Attainment is the acquisition of positive professional values and behaviours that result from observing positive role models and reflecting on experiences in a positive environment. Attrition is the development of negative behaviours and values or the seeping away of positive values through proximity to negative role models and a damaging culture. If the balance of influences is towards attainment, then students and developing doctors finally reach the stage of phronesis and professionalism. If the prevailing influences are negative, then the students' natural idealism on entering training can be turned into cynicism, self-interest and even self-preservation.

Educators therefore need to pay attention to values and behaviours that students see in the educational or training setting and (importantly) in clinical practice.



Tip

Provide a safe space for medical students and junior doctors to debrief and reflect

when they have witnessed unprofessional behaviour.

The unwritten and unintended lessons that medical students learn from their interactions with educators, peers, clinical supervisors and other clinical staff are known as the *hidden curriculum* as these lessons are often unacknowledged. It can be problematic because the values and behaviours on display can be contradictory to the values and behaviours being espoused in the formal curriculum causing students to be confused and in conflict about which code of behaviour to follow. The problems of the hidden curriculum and the necessity of identifying the impact that it has on the education and training of junior doctors have been well established ([Hafferty, 1998](#)), but it has been questioned recently whether this is now such a problem, given that so much scrutiny has ensured these issues are now far from hidden ([MacLeod, 2014](#)). Regardless of this debate, educators need to acknowledge and identify factors that might be contributing to attrition in Hilton and Slotnick's model and ensure students have the opportunity to reflect on these and discuss their impact. There are many ways to achieve this but reflective logs, critical incidence reporting and small-group discussions can all help. The model remains influential, being continually cited in the medical education literature over 15 years later.

The faculty and clinical staff that we trust with educating our students and trainees need to demonstrate professional behaviour themselves and provide positive role models. It can be difficult to address this issue directly, but through staff development sessions that discuss teaching and assessment of professionalism, the values and behaviours that we expect to see demonstrated to our students can be emphasized and addressed.



Tip

Using clips from medical dramas, such as *New Amsterdam*, *ER* or *House* can stimulate group discussions about professionalism.

The model of proto-professionalism also highlights the importance of developing and assessing professionalism in ways that are appropriate for the stage of education or training. Students' psychosocial and moral development, as well as their judgement and reflective skills, will proceed at different rates throughout their training. By creating teaching materials and assessments that acknowledge this staged approach, students can demonstrate that they have developed the incremental stages needed to become a full professional.

Digital professionalism

For the last 15 years or so, medical educators have been evolving ways to define and develop professionalism in students and trainees and during this time, the proliferation of social media has changed the way that we interact online. The fundamental principles and behaviours that we expect are the same but the way that these are expressed through social media can give rise to new problems in professionalism. These issues can be grouped into three main areas:

- Reputational issues: bringing the school, university or healthcare institution into disrepute through online activity or comments that would be seen as inappropriate or offensive by members of the public.
- Privacy: the same principles of confidentiality and privacy apply to online activity, but the ubiquity of cameras on mobile devices, as well as the instantaneousness of platforms, such as Twitter can turn inexperienced indiscretion into a national scandal.
- Distraction: social media has a beneficial presence in a healthcare setting but it is also an opportunity for distraction, which can lead to loss of productivity and potentially, medical errors.

In addition, things that were reasonably straightforward in the past such as professional boundaries and professional identity can be blurred if patients or colleagues become part of your social network.

Appropriate use of social media and other online activities should form a part of any professionalism framework and professionalism curriculum. Medical educators have a fantastic opportunity to help students and trainees to understand the value and pitfalls of being online, but this can be tricky if the educators feel that they know less about current trends in social media than the students! In addition, students and younger trainees appear to be completely comfortable with the technology at their fingertips but have often grown up without questioning the amount of information that they are sharing or the appropriateness of online behaviour in developing a professional identity.

Educating faculty on social media

A good place to start is by holding a workshop to educate faculty on the most common forms of social media, how they are used and how privacy settings work. It can also be helpful to examine case material where there have been unintended consequences of online activity and look at some common pitfalls that students might get into. A useful activity is to challenge each other to find material online that pertains to you or your colleagues' social or family life. This can have a sobering effect on the participant and cause them to attend to their own privacy settings!

Building in guidance on the use of social media

Most schools, universities and healthcare workplaces now have guidelines on the professional use of social media, but if yours does not, you should develop guidance so that you can give your students and trainees clear expectations of the behaviour that you expect. Some international medical associations have published their guidance; the subsequent one is from the British Medical Association who have also published a practical guide (<https://www.bma.org.uk/advice/employment/ethics/social-media-guidance-for-doctors>) but there are similar ones from the Canadian Medical Association (<http://policybase.cma.ca/dbtw-wpd/Polycypdf/PD12-03.pdf>) the General Medical Council (http://www.gmc-uk.org/guidance/ethical_guidance/21186.asp) and the American Medical Association (<http://journalofethics.ama-assn.org/2015/05/nlit1-1505.html>)



"Guidance for doctors on the use of social media from the British Medical Association (BMA)

- *You are still a doctor or medical student on social media*
- *Protect patient confidentiality*
- *Follow General medical Council guidance before taking and sharing pictures of patients or where you work*
- *Maintain professional boundaries*
- *Think before you share*
- *Think about whether you want to post anonymously as a doctor or identify yourself*
- *Be cautious in giving medical advice on social media*
- *Be open about any conflicts of interest*
- *Manage your privacy settings and content"*

BMA (2019 <https://www.bma.org.uk/advice/employment/ethics/social-media-guidance-for-doctors>)

Assessing professionalism

Given that assessment is a powerful stimulant for learning, it is important to find ways to assess professionalism that are robust, defensible, reliable and valid.

A single, definitive tool for assessing professionalism has not been identified but there are several common approaches including peer assessment, direct observation by faculty, reflective portfolios, critical incident report and objective structured clinical examinations. A summary of the types of assessment methods and their uses can be found in the article on assessing professionalism by van Mook and colleagues ([van Mook et al., 2009a](#)) and a systematic review of the effectiveness of different types of assessment has been carried out by Ning Ding and colleagues ([Ning Ding et al., 2017](#)). More important than choosing individual tools is to think about the assessment strategy for professionalism. Should you assess professionalism as an overall construct or build up a picture through assessments of individual components? Who should assess professionalism: faculty, clinical tutors, peers, patients? Individual assessment tools may measure different things or have lower validity than more traditional methods but through triangulation a robust summative assessment can be built up of an individual student.



"They don't respect what you expect, they respect what you inspect."

Arnold & Stern (2006)

Lambert Schuwirth has written extensively on the subject of programmatic assessment (most recently [Schuwirth & van der Vleuten, 2019](#)), which is intended to maximize the benefits of learning to the student and enable schools to make more informed summative decisions about the students' demonstration of the programme outcomes. This approach can be used to assess professionalism even if there is not a full programmatic assessment strategy in the school. Students gain meaningful feedback from assessment activities to enable them to learn and develop and to gain ownership of their learning so that their performance can be better in the next assessment. As students become more mature and used to this approach, they can direct their own learning and have some say in selecting the development activities that they need to undertake. This longitudinal flow of information about learners replaces a single high-stakes assessment. More practical advice on how to implement programmatic assessment can be found in [van Der Vleuten et al., 2015](#).

Most people working in medical education will be familiar with 'Miller's Pyramid' ([Miller, 1990](#)); a way of visualizing the stages that are needed in a competency-based education model. The stages of knows (knowledge), knows how (competency), shows how (performance) and does (action) has been enormously influential in shaping assessment strategies in medical education in general, and particularly important in assessing professionalism. [Cruess et al. \(2016\)](#) have recently suggested that Miller's

Pyramid should have an additional layer on top of the pyramid, namely, is (being). This layer represents professional identity and the complete integration of professional values and beliefs that are essential to professional behaviour. Wide acceptance of their suggestion would add a useful dimension to the way that professionalism might be assessed with the development of tools specifically designed to measure the acquisition of a defined professional identity.

Summary

Professionalism is now considered to be a routine part of the medical curriculum but there is no agreed definition, and the values and behaviours that educators want to develop in students and trainees can vary depending on the cultural context. Many national medical bodies have professionalism codes and requirements, and it is important to reach an agreed and widely shared understanding of professionalism for your students, faculty and clinical colleagues. Teaching and assessing professionalism is most effective when it is integrated into the curriculum and there should be a variety of learning opportunities and ways for students to learn from formative feedback before summative assessments are made. Specific guidance on digital professionalism with reflection on case studies can help students navigate social media without causing themselves or their profession any reputational damage. It is important to develop robust summative assessments that are respected by students and that test observable behaviours. It must be possible for students to 'fail' professionalism if attempts at remediation and support are to no avail as there is a link between unprofessional behaviour in medical school and practice. The key to establishing appropriate development opportunities is setting a culture of professionalism through positive role modelling and calling attention to unprofessional behaviour by students, faculty or clinical colleagues.

References

- Arnold and Stern, 2006 Arnold L, Stern DT. What is medical professionalism?. In: Stern DT, ed. *Measuring medical professionalism*. New York: Oxford University Press; 2006;15–37.
- BMA, 2019 BMA. (2019). Available from <https://www.bma.org.uk/advice/employment/ethics/social-media-guidance-for-doctors>.
- Birden et al., 2014 Birden H, Glass N, Wilson I, et al. Defining professionalism in medical education: a systematic review. *Medical Teacher*. 2014;36(1):47–61.
- Cherry et al., 2014 Cherry MG, Fletcher I, O'Sullivan H, Dornan T. Emotional intelligence in medical education: a critical review. *Medical Education*. 2014;48(5):468–478.
- Cherry et al., 2012 Cherry MG, Fletcher I, O'Sullivan H, Shaw N. What impact do structured educational sessions to increase emotional intelligence have on medical students? BEME Guide No 17. *Medical Teacher*. 2012;34(1):11–19.
- Cruess and Cruess, 1997 Cruess SR, Cruess RL. Professionalism must be taught. *British Medical Journal*. 1997;315:1674.
- Cruess et al., 2016 Cruess RL, Cruess SR, Steinert Y. Amending Miller's pyramid to include professional identity formation. *Academic Medicine*. 2016;91(2):180–185.
- Hafferty, 1998 Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. *Academic Medicine*. 1998;73(4):403–407.
- Hilton and Slotnick, 2005 Hilton SR, Slotnick HB. Proto-professionalism: how professionalisation occurs across the continuum of medical education. *Medical Education*. 2005;39(1):58–65.
- Jha et al., 2015 Jha V, McLean M, Gibbs T, Sandars J. Medical professionalism across cultures: a challenge for medicine and, medical educators. *Medical Teacher*. 2015;37:1–7.
- Koch, 2019 Koch T. Professionalism: An archaeology. *HEC Forum*. 2019;31:219–232 <https://doi.org/10.1007/s10730-019-09372-w>.
- MacLeod, 2014 MacLeod A. The hidden curriculum: is it time to reconsider the concept?. *Medical Teacher*. 2014;36(6):539–540.
- Mahmood et al., 2015 Mahmood S, Obika M, Teshigawara S, Kawabata T, Kataoka H. Nurturing the art of professionalism in Japanese medical

- students at Okayama University Medical School. *International Journal of School and Cognition Psychology*. 2015;2(128):2.
- Miller, 1990 Miller GE. The assessment of clinical skills/competence/performance. *Academic Medicine*. 1990;65(9 Suppl.):S63–S67.
- Ning Ding et al., 2017 Ning Ding HL, Zhang Y, Deliang Wen YL. *Assessing medical professionalism: a systematic review of instruments and their measurement properties*. PLOS ONE 2017; <https://doi.org/10.1371/journal.pone.0177321> Published May 2017.
- Papadakis et al., 2004 Papadakis MA, Hodgson CS, Teherani A, Kohatsu ND. Unprofessional behavior in medical school is associated with subsequent disciplinary action by a state medical board. *Academic Medicine*. 2004;79(3):244–249.
- Project Professionalism, 2002 Project Professionalism MP. Medical professionalism in the new millennium: a physicians' charter. *Lancet*. 2002;359(9305):520–522.
- Roth et al., 2019 Roth CG, Eldin KW, Padmanabhan V, Friedman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Medical Teacher*. 2019;41(7):746–749.
- Royal College of Physicians, 2005 Royal College of Physicians. *Doctors in society: medical professionalism in a changing world* London: Royal College of Physicians, Report of a Working Party; 2005.
- Schuwirth and van Der Vleuten, 2019 Schuwirth L, van Der Vleuten C. Current assessment in medical education: programmatic assessment. *Journal of Applied Testing Technology*. 2019;20.
- Stephenson et al., 2006 Stephenson AE, Adshead LE, Higgs RH. The teaching of professional attitudes within UK medical schools: reported difficulties and good practice. *Medical Education*. 2006;40(11):1072–1080.
- van Der Vleuten et al., 2015 van Der Vleuten C, Schuwirth L, Driessen E, et al. Twelve tips for programmatic assessment. *Medical Teacher*. 2015;37(7):641–646.
- van Mook et al., 2009a van Mook WN, Gorter SL, O'Sullivan H, et al. Approaches to professional behaviour assessment: tools in the professionalism toolbox. *European Journal of Internal Medicine*. 2009a;20(8):e153–e157.
- van Mook et al., 2009b van Mook WN, van Luijk SJ, de Grave W, et al. Teaching and learning professional behavior in practice. *European Journal of Internal Medicine*. 2009b;20(5):e105–e111.

- van Mook et al., 2009c van Mook WN, van Luijk SJ, O'Sullivan H, et al. The concepts of professionalism and professional behaviour: conflicts in both definition and learning outcomes. *European Journal of Internal Medicine*. 2009c;20(4):e85–e89.
- [van Mook et al., 2015](#) van Mook WNKA, van Luijk SJ, Zwietering PJ, et al. The threat of the dyscompetent resident: A plea to make the implicit more explicit!. *Advances in Health Sciences Education*. 2015;20:559–574.

Medical Research (in General) and Evidence-Based Medicine

Aliki Thomas and Benjamin Chin-Yee

Trends

- Evidence-based medicine (EBM) continues to be a focal topic of instruction in medical education.
- Teachers of EBM are encouraged to consider including content on the history of EBM including evolving conceptualizations.
- The optimal teaching of EBM may require the input a multidisciplinary and interprofessional team of teachers.

Key concepts

Epistemology: meaning or nature of knowledge, the sources and scope of knowledge and the criteria for judging that something can be legitimately considered as knowledge.

Reflexivity: the act of monitoring our reactions, feelings and motives and how these may influence what we think of and do in a given situation.

Critical appraisal: the process of carefully and systematically assessing the outcome of scientific research (evidence) to judge its trustworthiness, value and relevance in a particular context.

Introduction

Because evidence-based medicine (EBM) was announced as a 'new paradigm' for teaching the practice of medicine in 1992 ([Evidence-Based Medicine Working, 1992](#)), it has assumed a central place in medical education. Principles of EBM, which include skills in asking an answerable question, critical appraisal and evaluation of evidence, have become key competencies for medical learners. Although many of EBM's core ideas remain important for medical teachers, the movement has evolved over the quarter century since its initial conception, creating the need to update and review what EBM means today and how it remains relevant in medical education. This chapter serves as an introduction to EBM for medical teachers. We begin by discussing EBM's historical development and evolution to help contextualize EBM's current role in medical education. From this updated account of EBM, we explore key implications for medical teachers and recommend specific strategies for teaching EBM to trainees.

What is evidence-based medicine?



"EBM is the conscientious, explicit and judicious use of the best current evidence in making decisions about the care of individual patients."

Sackett et al. (1996)

Since its inception, EBM has expanded to impact many domains from clinical medicine to health policy ([Djulfegovic & Guyatt, 2017](#)). Principles behind EBM now shape how healthcare professionals justify clinical decisions and engage with the medical literature, increasingly in the form of systematic reviews and clinical practice guidelines. Given that the term EBM today has taken on many different meanings and uses, it is valuable to revisit EBM's initial formulation and recall the ideas that informed its early development.

The foundational article, 'Evidence-based medicine: a new approach to teaching the practice of medicine,' published in the *Journal of the American Medical Association* in 1992, explicitly formulates EBM as a movement in medical education ([Guyatt et al., 1992](#)). Although EBM was announced as a 'new paradigm' and 'new philosophy of medical practice and teaching,' the movement was intimately linked to the growth of clinical epidemiology during the preceding decades ([Feinstein, 1985](#)), which was itself continuous with a longer lineage of attempts to establish an empirical and quantifiable basis for medical decision making ([Rosser, 1995](#)). EBM was a response to a perceived overreliance on pathophysiologic principles, unsystematic observation, and clinical expertise, which was believed to lead to persistence of ineffective or harmful practices.

Proponents of EBM argued that medical decision making should be based on 'evidence,' and that medical trainees should learn skills in understanding 'rules of evidence' to interpret the research literature and effectively apply it in patient care. These 'rules of evidence' were later expounded in the form of 'evidence hierarchies,' which proliferated in EBM's wake ([Bluhm, 2011](#); [Djulfegovic & Guyatt, 2014](#)). Evidence hierarchies ranked research studies based on methodologic strength, placing particular emphasis on randomized-controlled trials (RCTs) as producing the 'gold standard' in evidence. Evidence hierarchies have faced numerous criticisms and have undergone several revisions but still form the basis for EBM and current clinical practice guidelines ([Mercuri & Gafni, 2018](#)).

EBM consists of a process of defining a clinical question, identifying the relevant literature, and evaluating the evidence to determine its validity and applicability to the question at hand. For example, a learner may encounter this question: "What is the optimal duration of antibiotics treatment for community-acquired pneumonia?" Such a question prompts a literature search, which yields relevant studies ([Uranga et al., 2016](#)) that are evaluated using a range of criteria, from methodologic soundness to applicability in their own patient population and clinical practice.

Although the philosophy of EBM has been subject to differing interpretations, this

critical and pragmatic ethos is worth highlighting for medical teachers and should inform how EBM is presented to learners. What is crucial to recognize is how EBM's value lay not in a particular theory of knowledge or specific evidence hierarchy but rather in its encouragement of continued questioning of the relationship between evidence and practice. The earlier quotation by [Sackett et al. \(1996\)](#), initially offered in response to early critics of the movement, has since become one of the most influential and accepted definitions of EBM. This definition, which argues for an approach that is 'conscientious, explicit and judicious' and oriented towards improving patient care, captures the critical, reflexive and pragmatic ethos behind the movement, and underscores the key virtues which medical educators should aim to cultivate in teaching EBM ([Upshur, 2002](#)). The virtues that informed early discussions of EBM intersect with contemporary approaches to teaching clinical skills which include a focus on cultivating critical reflexivity amongst learners; this requires recognition of one's situatedness in the clinical decision-making process, the context in which one is situated during clinical encounters and the limits of one's knowledge. Next, we explore why and how EBM evolved from these earlier accounts and the implication for medical teachers today.

Evolution of evidence-based medicine

Since its original definition almost 25 years ago, EBM has seen an expansion and reconceptualization of its core doctrine, sparked primarily by advances in research on clinical decision making, knowledge translation, patient-centred care and shared decision making, in addition to renewed attention to notions of evidence and different ways of knowing in medicine ([Greenhalgh et al., 2015](#); [Upshur, 2005](#)). There has been a growing acknowledgment that EBM's traditional framework offers an overly reductionist approach to clinical decision making. This framework is commonly depicted by three circles, 'research evidence', 'clinical expertise' and 'patient values and preferences' ([Fig. 27.1](#)), which are said to interact and influence one another in the decision-making process. This representation however, falls short of fully and adequately characterizing the nature and breadth of each of the three concepts and does not do justice to the core principles and epistemology (defined as the meaning or nature of knowledge, the sources and scope of knowledge and the criteria for knowledge) ([Borchert, 2006](#); [Steup, 2017](#)) of each ([Fig. 27.2](#)). As an example, there have been vigorous debates on what 'evidence' actually means. The crux of many arguments on EBM across health professions (medicine, nursing, rehabilitation) is one of legitimacy of various ways of knowing, that is, if, how, and under what circumstances various forms of knowledge (e.g., sources of knowledge other than those obtained through large-scale population studies and RCTs) can be justifiably evoked, and ultimately mobilized, in the pursuit of informed clinical decision making ([Goldenberg, 2006](#); [Greenhalgh et al., 2015](#); [Wyer & Silva, 2009](#)).

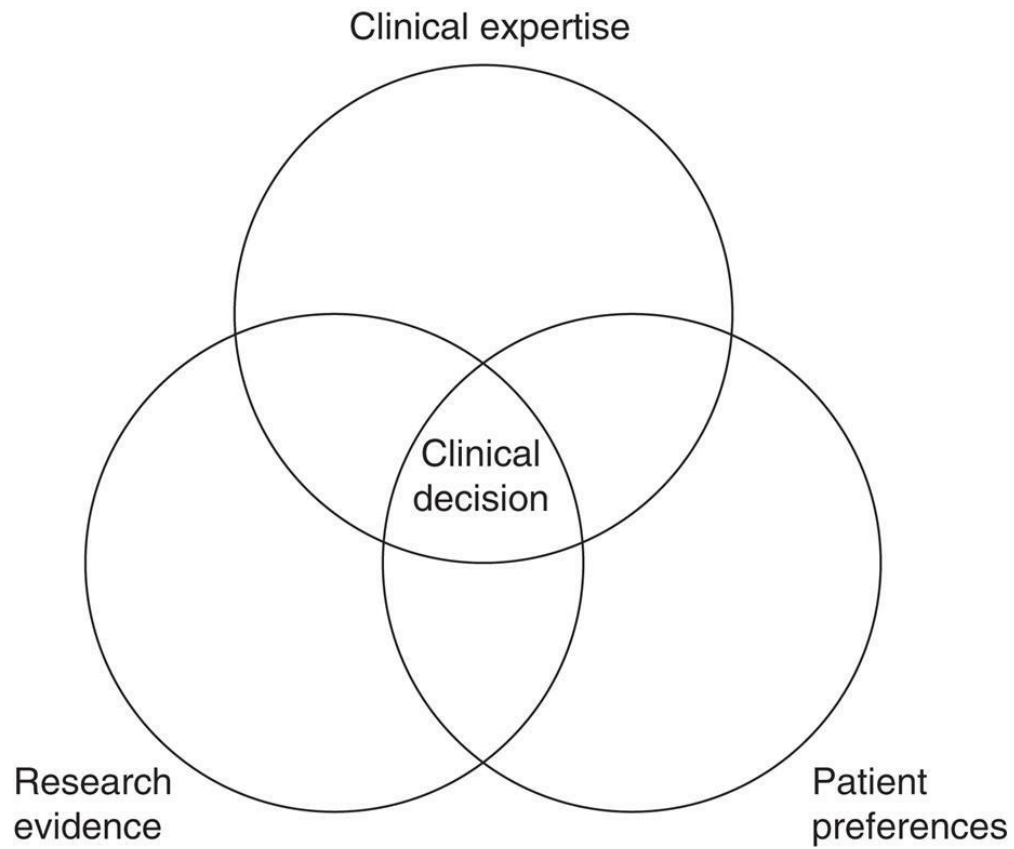


FIG. 27.1 Traditional model for evidence-based medicine.

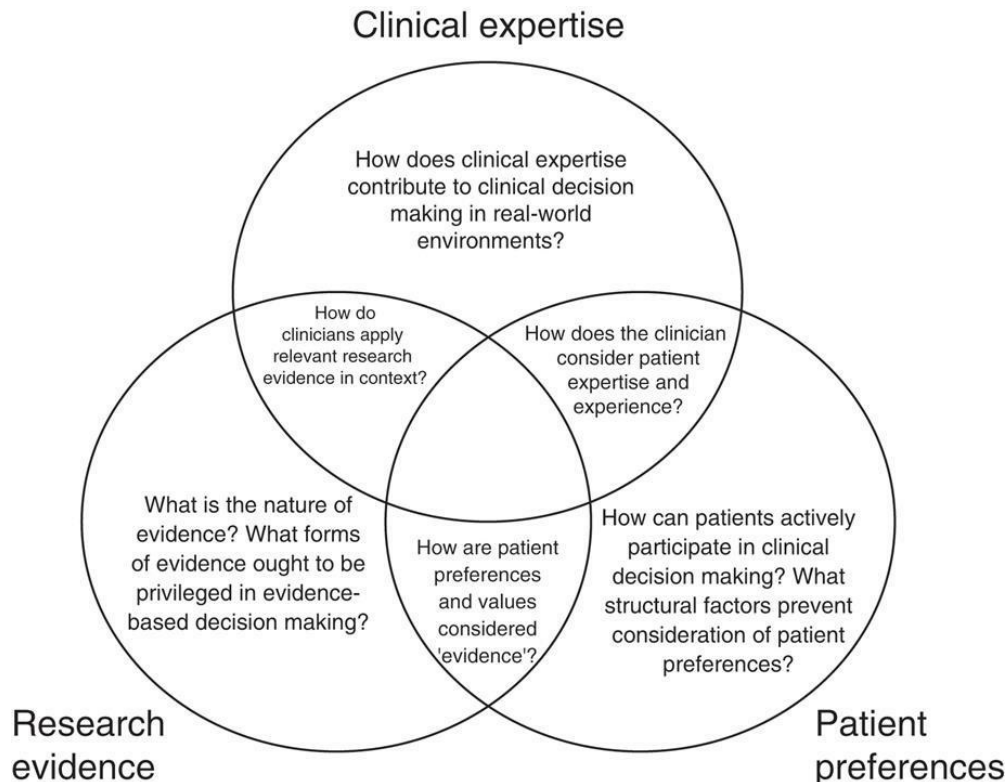


FIG. 27.2 Traditional model for evidence-based clinical decisions alongside with key questions arising from contemporary critiques of evidence-based medicine. (From [Sackett et al., 1996](#).)

Patient input as an EBM component has also been the target of controversy. Patients' participation in their care is accepted as necessary in healthcare systems that emphasize, for example, health promotion, prevention and self-management ([Lavalley et al., 2016](#); [Noonan et al., 2017](#)). Yet, despite mounting interest in the patient's role in evidence-based decision making, some have called into question whether patients are actively participating in making decisions about the care they receive. Such queries have arisen from concerns surrounding power imbalances between providers and consumers of healthcare that may overturn or suppress the patient's perspective, as well as structural and organizational factors that emphasize efficiency, often to the detriment of person-centred care ([Hammell, 2001](#)).

Finally, studies in educational psychology and cognitive science have explored the concept of professional experience and expertise and provided rich insights into how these contribute to clinical decision making in authentic and simulated environments ([Chi et al., 1988](#)). This literature converges on the notion that a clinician makes sense of the available evidence in light of a rich knowledge base and extensive clinical experience. In some cases, a departure from a clinical practice guideline, for example, means that the clinician has made a deliberate decision in the best interest of their patient ([Thomas et al., 2011; 2012b](#)).

With advances in our knowledge of these three areas, it is no surprise that what EBM 'is' and what it 'means' to clinicians and teachers in medical education has evolved since the 1990s. In 2009, [Satterfield et al. \(2009\)](#) proposed a revised model of evidence-

based practice (EBP) that includes the environment and organizational context, as elements of the clinical decision-making process. In parallel, [Bannigan and Moores \(2009\)](#) and [Dawes et al. \(2005\)](#) portrayed evidence-based decision making as a four-construct process where the decision, as the central component, is the result of the interaction between 'evidence from research', 'clinician judgement', 'client values' and 'resources'. For the first time since the origin of the EBM movement, context was explicitly integrated and depicted in a graphical representation of evidence-based decision making. The most recent 'transdisciplinary model of evidence-based practice' represents EBM as a multicomponent and multisector process that may be influenced by organizational mandates, the practice communities within which clinicians work, the available resources and constraints in the working environment, as well as the training and supervision of learners, stressing the role of the educational environment in EBM. This model also comprises the sociopolitical, economic, political and professional contexts, as macro-level factors, which can impact clinical decision making at an individual level. As such, the 'transdisciplinary model of evidence-based practice' offers a more inclusive approach to evidence-based decision making than the original one. We propose that medical schools embrace and promote a broader conceptualization of EBM. A shift in both what is taught and how it is taught is necessary for learners to be prepared to embrace the critical and pragmatic spirit that originally motivated the EBM movement. In this final section, we begin with a brief overview of the literature on the effectiveness of various EBM approaches. We then offer suggestions for teaching EBM that will foster in learners a spirit of curiosity, reflexivity and criticism, while always being oriented towards improving decision making in patient care.

Implications for medical teachers

Although a large body of literature on the teaching of EBM exists, it is beyond the scope of this chapter to extensively review this evidence base. Rather, in this final section, we present a synopsis of the main findings on the most effective strategies for promoting the competencies associated with EBM. Based on the proposed reconceptualization of EBM discussed in the first two sections, we offer suggestions and food for thought for teachers of EBM.

Literature on teaching evidence-based medicine

There are several systematic reviews on the effectiveness of EBM interventions including, but not limited to journal clubs, online platforms, didactic lectures, case-based sessions, that have been used in entire curricula, standalone courses and/or short workshops (Aglen, 2016; Ahmadi et al., 2015; Dizon et al., 2012; Larsen et al., 2019; Wong et al., 2013; Young et al., 2014). Most studies report on outcomes such as EBM knowledge and skills in the five-step process, on attitudes towards EBM and on EBM behaviours (e.g., posing an answerable question, finding and appraising the literature). Overall, these systematic reviews have concluded that there is no one best approach for teaching EBM. Moreover, there is no evidence of long-term changes in EBM knowledge, skills, attitudes and behaviours. Most studies report on proximal outcomes, and as such, it is not possible to conclude on changes in practice beyond those reported in the short study time frames. Importantly, these systematic reviews are fraught with limitations. For example, there is a combination of study designs, each one carrying a different risk of methodologic bias and inclusion of diverse interventions (e.g. single, multifaceted, active, passive), modes of delivery (e.g. standalone, longitudinal), populations (e.g. undergraduate, postgraduate, and allied healthcare professionals) and assessment tools (e.g. some validated, others without strong psychometric properties) which precludes metaanalysis of the findings and thus, results from these systematic reviews are mainly descriptive.

Main findings on teaching of evidence-based medicine

Despite these methodologic limitations, the studies provide some guidance on the teaching of EBM that may be used in a flexible and tailored manner to address the needs of learners and curriculum designers. We have organized these into four groupings: what should be taught (content), how should it be taught (educational methods and approaches), when should it be taught (timing/scheduling of EBM teaching) and who should be teaching (which faculty should be teaching EBM content)?

What evidence-based medicine content should be taught?

- Most interventions integrate the first three steps (formulating a clinical question,

effectively searching the literature for the best available evidence and critically appraising evidence to determine its validity and relevance) of the EBM process rather than all five steps. The application of evidence to decision making and the evaluation of outcomes (e.g., steps 4 and 5 of the EBM process) are infrequently addressed.

- There is no evidence for the optimal number of hours of EBM teaching. This varies based on programme length and other competing content areas in the curriculum. Early exposure, as mentioned in the previous point, can support a smoother introduction of EBM content than exposure at later stages of instruction.
- Given the evidence that multiple EBM interventions are more effective than a single intervention in improving EBM knowledge and skills ([Young et al., 2014](#)), instructors should carefully design their EBM content to include the optimal number of EBM sessions for their institution.

How should the evidence-based medicine content be taught (educational methods and approaches)?

- Multifaceted approaches, such as those that combine didactic teaching, interactive small group sessions, performing literature searches and hands on projects, are more likely to lead to EBM outcomes, such as skills in critical appraisal ([Young et al., 2014](#)).
- Longitudinal courses (i.e., courses that span a longer period of training and are threaded through a course of study) have a greater impact on EBM outcomes than standalone (e.g., 1-week EBM course, short workshop) or passive (e.g., didactic lectures) interventions.
- Clinically integrated (i.e., embedded within fieldwork or clerkship) ([Maggio, 2016](#)) interventions have a greater impact on EBM knowledge, skills, attitudes and behaviours. Note however, that some studies have shown that clinicians may not model the application of EBM in a manner that supports and complements classroom teaching of EBM ([Maggio, 2016](#); [Thomas et al., 2017](#)). Suboptimal role modelling of EBM has led to calls for faculty development on how to support learners in EBM during clinical education ([Blanco et al., 2014](#)).
- Computer-assisted training (e.g., online tutorials, videos, podcasts) is as efficacious as face-to-face instruction and can be used in combination with classroom instruction to relieve the burden on instructors who may use classroom time to review more complex examples of the application of EBM and provide more flexibility to learners who may select when to review didactic materials ([Ahmadi et al., 2015](#)).

When should the teaching of evidence-based medicine take place (timing/scheduling of the teaching)?

- Teaching EBM should begin early in a programme of study. Early and graded exposure to the fundamental principles of EBM is analogous to a 'building bloc approach' (Ilic & Maloney, 2014; Thomas et al., 2011). Learning how to formulate a clinical question for a given case before searching the literature and learning how to appraise scientific research over a period of several classes or terms can help learners master each step. It also reduces the risk of learners being overwhelmed by having to learn new skills in a short amount of time. Teaching of the different steps of the process can also be integrated with other courses.
- The benefits of including the discrete steps of EBM in other courses include opportunity to practice and to see applications of EBM in other content areas. This has been shown to increase learners' attitudes towards EBM and their satisfaction with EBM training (Ilic & Maloney, 2014; Thomas et al., 2017).
- The impact of EBM teaching varies depending on the level of the trainee. The impact is greater in the undergraduate setting than in the postgraduate setting. Standalone interventions aimed at undergraduate learners improve EBM knowledge only, whereas clinically integrated and multifaceted interventions improve knowledge, skills and possibly attitudes and behaviours. Standalone interventions are not effective in the postgraduate setting.

Who should be teaching (which faculty should be teaching evidence-based medicine content)?

- Physicians most often teach EBM (Maggio et al., 2013) in medical school. However, a multidisciplinary and interprofessional teaching approach that involves biostatisticians, librarians, clinicians and other content experts can also be used to model a collaborative approach to EBM and ensure learners are exposed to the content knowledge and skills necessary to apply EBM (Thomas et al., 2011; 2017). This approach is also more aligned with the more modern conceptualizations of EBM presented in Section 1.

Suggestions for teaching evidence-based medicine

To date, the teaching of EBM has focused primarily on the knowledge and skills required to execute the five steps. The literature on learners' exposure to the long history and legacy of EBM, its developments over time and the ongoing debates about the value of other sources of knowledge is scarce. The unfortunate consequence of this absence of content in medical schools perpetuates a reductionist view of EBM. Learners may be left with the impression that EBM is primarily a technical or skill-based process rather than a complex, multifaceted decision-making process that is seldom as straightforward as executing the five steps. Although helping learners to develop their knowledge and skills in these steps is essential for understanding and applying EBM, we propose that teachers consider expanding the teaching to include the following (Table 27.1):

1. The history and evolution of EBM, including the debates in the literature surrounding the merits and challenges of EBM. This could help learners to develop a more nuanced understanding of EBM and to be better prepared for clinical practice where the application of the traditional five-step process may not always be achievable or aligned within the practice culture in different clinical contexts.
2. Rather than present EBM as the only approach, or the privileged approach in clinical decision making, teachers should stress that other approaches, such as shared decision making may be equally, if not more appropriate for a given clinical encounter. Learners should be taught to appreciate the multifaceted nature of clinical decision making and the strengths and limitations of EBM.
3. A comparison between the original and newer conceptualizations and/or models of EBM (presented earlier) with explicit discussion on how the latter were born out of developments and changing practice directions in medicine.
4. Inclusion of a broader and more diverse literature (ranging from cognitive science and psychology to philosophy and sociology) can help to deepen learners' understanding of EBM components from the concept of evidence ([Upshur et al., 2001](#)), to patient involvement ([Greenhalgh et al., 2015](#)) and clinician experience ([Copley et al., 2010](#); [Thomas et al., 2012a](#)) that could be used to examine: (a) the many sources of knowledge (e.g., obtained through RCTs, qualitative studies, patient narratives) and their merits in clinical decision making; (b) the role of reflexivity, intuition, reasoning and problem solving in EBM; (c) the growing emphasis in healthcare practice and medical education on patient-centred care and shared decision making; and (d) patients' access to electronic information sources.
5. Teaching the five-step process over the course of a programme of study time (i.e., embedding the content in multiple courses throughout a curriculum).
6. Including patients and other team members, such as librarians, biostatisticians, content experts, clinicians and decision makers, will highlight the multidisciplinary and interprofessional aspects of EBM and expose learners to the advantages and challenges of EBM from these different perspectives.
7. Teachers must recognize and make explicit to learners that EBM's value lay not in a particular theory of knowledge or specific evidence hierarchy, but rather, in its encouragement of continued questioning of the relationship between evidence and practice.

Table 27.1 Suggestions for teaching evidence-based medicine

| What and how to teach evidence-based medicine (EBM) | Rationale |
|---|--|
| History of EBM Evolution of EBM Debates surrounding EBM Merits and challenges of EBM | <ul style="list-style-type: none"> • helps learners to develop a more nuanced understanding of EBM • better prepares learners for challenging clinical practice situations and contexts • better prepares learners for application of the traditional |

| | |
|---|---|
| | 5-step model of EBM in complex settings and with ill-defined problems |
| Other approaches to clinical decision making such as shared decision making | <ul style="list-style-type: none"> • helps learners recognize EBM as one approach to clinical decision • helps learners appreciate the multifaceted nature of clinical decision making and the strengths and limitations of different approaches (e.g., shared decision making) |
| Comparing and contrasting original and newer conceptualizations and/or models of EBM | <ul style="list-style-type: none"> • makes explicit for learners how modern models of EBM were born out of developments and practice directions in medicine |
| Inclusion of a broader and more diverse literature, cognitive science, psychology, philosophy and sociology | <ul style="list-style-type: none"> • helps learners to deepen their understanding of the concept of evidence, patient involvement and clinician experience • exposes learners to the many sources of knowledge (e.g., obtained through randomized controlled trials, qualitative studies, patient narratives) • exposes learners to the merits of each knowledge source in clinical decision making; • highlights the role of reflexivity, intuition, reasoning and problem solving in EBM • highlights the growing emphasis on patient-centred care and shared decision making in healthcare practice and medical education |
| Teaching the 5-step process over the course of a programme of study time (i.e., embedding the content in multiple courses in a curriculum | <ul style="list-style-type: none"> • helps learners recognize that this is one way of answering clinically relevant questions and that EBM must be applied critically and reflexively |
| Including patients and other team members (e.g., as librarians, biostatisticians, content experts, clinicians and decision makers) | <ul style="list-style-type: none"> • highlight the multidisciplinary and interprofessional aspects of EBM • expose learners to the advantages and challenges of EBM from various perspectives |
| Professional questioning or relationship between evidence and practice | <ul style="list-style-type: none"> • help learners appreciate that that EBM's value lay not in a particular theory of knowledge or specific evidence hierarchy, but rather, in its encouragement of continued questioning of the relationship between evidence and practice |

Summary

Teaching EBM in healthcare today requires recognition of the movement's development over the past quarter century, and attention to its continued evolution with changing forms of medical knowledge and models of clinical care. Although EBM has had a significant impact on clinical practice and medical education, several important criticisms have been raised, necessitating revisions towards more inclusive models of clinical decision making. Despite these limitations, at the core of the EBM movement is a critical, reflexive and pragmatic ethos, which remain the most salient principles for teaching EBM to healthcare professionals. Future clinicians must be prepared to embrace and critically reflect on how both the positive and critical aspects of EBM's legacy have shaped current discussions and developments on teaching practices. Future clinicians must become critical thinkers and reflective practitioners, positioned to thoughtfully consider what EBM means for them as future healthcare providers, for their patients, for their profession and for society at large.

Teachers ought to avoid teaching content and using educational methods that disproportionality emphasize the knowledge and skills of EBM (i.e., of the five-step process) because this approach portrays EBM largely as a skill-based process that is independent of other more critical competencies, such as shared decision making, clinical reasoning, patient-centred care and critical reflexivity.

Educators of EBM should work collaboratively with a multidisciplinary and interprofessional group of stakeholders to ensure that learners receive instruction on EBP that considers the available scientific evidence and other legitimate sources of knowledge in the content area in which EBM will be applied, while also considering the influence of context in decision making and the richness of patients' perspectives which greatly impact the EBM process.

References

- Aglen, 2016 Aglen B. Pedagogical strategies to teach bachelor students evidence-based practice: A systematic review. *Nurse Education Today*. 2016;36:255–263.
- Ahmadi et al., 2015 Ahmadi S-F, Baradaran HR, Ahmadi E. Effectiveness of teaching evidence-based medicine to undergraduate medical students: A BEME systematic review. *Medical Teacher*. 2015;37:21–30.
- Bannigan and Moores, 2009 Bannigan K, Moores A. A model of professional thinking: integrating reflective practice and evidence based practice. *Canadian Journal of Occupational Therapy*. 2009;76:342–350.
- Blanco et al., 2014 Blanco MA, Capello CF, Dorsch JL, Perry G, Zanetti ML. A survey study of evidence-based medicine training in US and Canadian medical schools. *Journal of the Medical Library Association: JMLA*. 2014;102:160–168.
- Bluhm, 2011 Bluhm RBK. Evidence-based medicine. In: Gabbay DM, Thagard P, Woods J, eds. *Handbook of the philosophy of medicine*. 1st ed. Elsevier 2011.
- Borchert, 2006 Borchert DM. *Encyclopedia of philosophy* 2nd ed. USA: Thomson Gale/Macmillan Reference; 2006.
- Chi et al., 1988 Chi MTH, Glaser R, Farr M. *The nature of expertise* Hillsdale, NJ: Lawrence Erlbaum Associates; 1988.
- Copley et al., 2010 Copley JA, Turpin MJ, King TL. Information used by an expert paediatric occupational therapist when making clinical decisions. *Canadian Journal of Occupational Therapy*. 2010;77:249–256.
- Dawes et al., 2005 Dawes M, Summerskill W, Glasziou P, et al. Sicily statement on evidence-based practice. *BMC Medical Education*. 2005;5.
- Dizon et al., 2012 Dizon JMR, Grimmer-Somers KA, Kumar S. Current evidence on evidence-based practice training in allied health: a systematic review of the literature. *International Journal of Evidence-Based Healthcare*. 2012;10:347–360.
- Djulbegovic and Guyatt, 2014 Djulbegovic B, Guyatt G. (2014). Evidence-based medicine and the theory of knowledge. In Jamaevidence (ed.) *Users' guides to the medical literature: a manual for evidence-based clinical practice*. 3rd Edition ed.
- Djulbegovic and Guyatt, 2017 Djulbegovic B, Guyatt G. Progress in

- evidence-based medicine: a quarter century on. *Lancet*. 2017;390:415–423.
- [Evidence-Based Medicine Working Group, 1992](#) Evidence-Based Medicine Working Group. Evidence-based medicine A new approach to teaching the practice of medicine. *JAMA*. 1992;268:2420–2425.
- [Feinstein, 1985](#) Feinstein AR. A bibliography of publications on observer variability. *Journal of Chronic Diseases*. 1985;38:619–632.
- [Goldenberg, 2006](#) Goldenberg MJ. On evidence and evidence-based medicine: lessons from the philosophy of science. *Social Science and Medicine*. 2006;62:2621–2632.
- Greenhalgh et al., 2015 Greenhalgh T, Snow R, Ryan S, Rees S, Salisbury H. Six 'biases' against patients and carers in evidence-based medicine. *BMC Medicine*. 2015;13.
- [Guyatt et al., 1992](#) Guyatt G, Cairns J, Churchill D. Evidence-based medicine A new approach to teaching the practice of medicine. *Journal of American Medical Association*. 1992;268:2420–2425.
- [Hammell, 2001](#) Hammell KW. Using qualitative research to inform the client-centered evidence-based practice of occupational therapy. *British Journal of Occupational Therapy*. 2001;64:228–234.
- Ilic and Maloney, 2014 Ilic D, Maloney S. Methods of teaching medical trainees evidence-based medicine: a systematic review. *Medical Education*. 2014;48:124–135.
- [Larsen et al., 2019](#) Larsen CM, Terkelsen AS, Carlsen A-MF, Kristensen HK. Methods for teaching evidence-based practice: a scoping review. *BMC Medical Education*. 2019;19:259.
- [Lavallee et al., 2016](#) Lavallee DC, Chenok KE, Love RM, et al. Incorporating patient-reported outcomes into health care to engage patients and enhance care. *Health Affairs*. 2016;35:575–582.
- Maggio, 2016 Maggio LA. Educating physicians in evidence based medicine: current practices and curricular strategies. *Perspectives on Medical Education*. 2016;5:358–361.
- [Maggio et al., 2013](#) Maggio LA, Tannery NH, Chen HC, Ten Cate O, O'Brien B. Evidence-based medicine training in undergraduate medical education: a review and critique of the literature published 2006-2011. *Academic Medicine*. 2013;88:1022–1028.
- [Mercuri and Gafni, 2018](#) Mercuri M, Gafni A. The evolution of GRADE (part 1): Is there a theoretical and/or empirical basis for the GRADE framework?. *Journal of Evaluation in Clinical Practice*. 2018;24:1203–1210.

- Noonan et al., 2017 Noonan VK, Lyddiatt A, Ware P, et al. Montreal Accord on Patient-Reported Outcomes (PROs) use series - Paper 3: patient-reported outcomes can facilitate shared decision-making and guide self-management. *Journal of Clinical Epidemiology*. 2017;89:125–135.
- Rosser, 1995 Rosser MJ. *Quantification and the quest for medical certainty* Princeton University Press 1995.
- Sackett et al., 1996 Sackett DL, Rosenberg WM, Gray JA, Haynes BR, Richardson SW. Evidence based medicine: what it is and what it isn't. *British Medical Journal*. 1996;312:71–72.
- Satterfield et al., 2009 Satterfield JM, Spring B, Brownson RC, et al. Toward a transdisciplinary model of evidence-based practice. *Milbank Q*. 2009;87:368–390.
- Steup, 2017 Steup MZE. Epistemology. In: Zalta EN, ed. *The Stanford Encyclopedia of Philosophy*. Stanford University: The Metaphysics Research Lab; 2017.
- Thomas et al., 2017 Thomas A, Han L, Osler BP, Turnbull EA, Douglas E. Students' attitudes and perceptions of teaching and assessment of evidence-based practice in an occupational therapy professional Master's curriculum: a mixed methods study. *BMC Medical Education*. 2017;17:64.
- Thomas et al., 2011 Thomas A, Saroyan A, Dauphinee WD. Evidence-based practice: a review of theoretical assumptions and effectiveness of teaching and assessment interventions in health professions. *Advances in Health Sciences Education*. 2011;16:253–276.
- Thomas et al., 2012a Thomas A, Saroyan A, Lajoie SP. Creation of an evidence-based practice reference model in falls prevention: findings from occupational therapy. *Disability and Rehabilitation*. 2012a;34:311–328.
- Thomas et al., 2012b Thomas A, Saroyan A, Snider LM. Evidence-based practice behaviours: A comparison amongst occupational therapy students and clinicians. *Canadian Journal of Occupational Therapy*. 2012b;79:96–107.
- Upshur, 2002 Upshur R. If not evidence, then what? Or does medicine really need a base?. *Journal of Evaluation in Clinical Practice*. 2002;8:113–119.
- Upshur, 2005 Upshur RE. Looking for rules in a world of exceptions: reflections on evidence-based practice. *Perspectives in Biology and Medicine*. 2005;48:477–489.

- [Upshur et al., 2001](#) Upshur RE, Vandenkerkhof EG, Goel V. Meaning and measurement: an inclusive model of evidence in health care. *Journal of Evaluation in Clinical Practice*. 2001;7:91–96.
- [Uranga et al., 2016](#) Uranga A, España PP, Bilbao A, et al. Duration of antibiotic treatment in community-acquired pneumonia: a multicenter randomized clinical trial. *JAMA Internal Medicine*. 2016;176:1257–1265.
- [Wong et al., 2013](#) Wong SC, MCEvoy MP, Wiles LK, Lewis LK. Magnitude of change in outcomes following entry-level evidence-based practice training: a systematic review. *International Journal of Medical Education*. 2013;4:107–114.
- [Wyer and Silva, 2009](#) Wyer PC, Silva SA. Where is the wisdom? I- A conceptual history of evidence-based medicine. *Journal of Evaluation in Clinical Practice*. 2009;15:891–898.
- [Young et al., 2014](#) Young T, Rohwer A, Volmink J, Clarke M. What are the effects of teaching evidence-based health care (EBHC)? Overview of systematic reviews. *PLoS ONE*. 2014;9:e86706.

Patient Safety and Quality of Care

Linda A Headrick, Douglas E Paull and Kevin B Weiss

Trends

- Patient safety and quality improvement education is helping move healthcare towards a systems approach to problem-solving and away from blaming individual healthcare professionals for medical errors.
- Medical teachers increase the effectiveness of patient safety and quality improvement education by integrating these efforts into the daily work of the trainee in the classroom and at the bedside.
- Patient safety and quality improvement work is inherently team-based and thus requires interprofessional learning experiences.
- Learners are important contributors to healthcare organizational learning. Achieving this requires the collaboration between educators, patient safety and quality improvement officers, executive leaders, and other clinical care team members.

Key concepts

- Healthcare quality and patient safety (PS) education requires an appreciation of the complexities of healthcare systems and a deeper understanding of human factors (i.e., the interaction of the healthcare professional, medication and devices, and environment in improving or keeping those systems safe).
- Medical teachers enhance learning outcomes by providing 'hands-on' experiences for medical students, residents, and fellows in PS and quality improvement (QI) (e.g., participation in PS event analyses and QI projects).
- Creating and delivering these learning opportunities involves meaningful collaboration between medical teachers, QI/PS personnel, and executive healthcare leaders to provide real experiences aligned with the healthcare organization's goals.
- Successful QI/PS education requires attention to developing faculty as QI/PS education leaders, coaches and role models

Introduction

Each year patients suffer patient safety events while both hospitalized and while receiving care in the ambulatory setting. Regardless of where in the world healthcare quality is being measured, the findings suggest there are substantial opportunities for improving basic aspects of acute and chronic patient care.

Patient safety and healthcare quality sciences, methods, and skill development are recognized as important to medical education internationally ([WHO, 2019](#)). Medical education leaders emphasize that patient safety and healthcare quality are essential topics in a successful medical education curriculum ([Irby et al., 2010](#)). In the United States, recent education and training in healthcare quality and patient safety is rapidly entering the mainstream of medical education ([Accreditation Council for Graduate Medical Education, 2019](#); [Association of American Medical Colleges, 2019](#)). Creating and deploying a successful curriculum in the sciences of healthcare quality and patient safety is challenging.

As with other aspects of medical education, the educational objectives need to focus on knowledge acquisition, skill development, clear milestones that define progression, and tools for assessment of educational outcomes. This evolution in the medical curriculum requires faculty development in both the practice of and teaching of patient safety and quality improvement. However, unlike some of the areas in medical education which primarily centre on the dyad of the physician and his or her patient (and family); patient safety and healthcare quality requires the engagement of the physician and patient dyad along with a commitment from the leadership of their clinical learning environment, as well as collaboration with other members of the healthcare team.

This chapter focuses on three objectives: (1) to provide an brief introduction to healthcare quality and patient safety to those educators who are new to these sciences; (2) to offer an introduction on how to construct an educational experience in these fields for medical students, residents and fellows; and (3) to identify some resources to help the reader organize and implement successful learning experiences and assessment in patient safety and healthcare quality.

Introduction to patient safety

The World Health Organization (WHO) defines patient safety as the absence of preventable harm to a patient during the process of healthcare ([WHO, 2019](#)). Early learners, for example, undergraduate and postgraduate physicians in training, are important members of the clinical teams caring for patients and represent future leaders in healthcare. Their participation, engagement, and integration into an institution's patient safety strategy and activities is critical for the student's full professional development as a physician, to increase organizational learning, and for improvement in patient outcomes.

The [Accreditation Council for Graduate Medical Education \(ACGME\)](#), as part of its Clinical Learning Environment Review (CLER) programme, conducts periodic site visits to sponsoring institutions (SIs) where there is postgraduate education. The site visits include multiple walk rounds during which CLER field representatives visit different clinical areas within the SI, interviewing postgraduate physicians, faculty, nurses, and other healthcare professionals ([ACGME, 2016](#)). During walking rounds in a preoperative area, a CLER site visitor asked a third-year resident if they had witnessed any adverse events or close calls during their training. The resident stated they had not. The site visitor asked if operations were ever cancelled because of abnormal laboratory tests, such as a high International normalized ratio level. The resident responded that they had a case like that earlier in the morning but fortunately had "caught it in time". They went on to mention that such events happen "all the time".

This story highlights a gap in patient safety education. The well-intentioned postgraduate physician in training was relying on their own individual efforts to address a recurrent patient safety problem instead of reporting the event into the organization's central patient safety event reporting system, participating in a patient safety event analysis, and helping develop (along with other interprofessional clinical care team members) systems-based solutions to prevent a recurrence of the problem.

Some of the essential elements for patient safety knowledge, skills, and attitudes include: (1) learner participation in patient safety event investigations; (2) learner integration into a healthy, organizational safety culture; (3) learners achieving competencies in teaming behaviours; and (4) learner understanding of human factors engineering principles as applied to healthcare.

Learner participation in patient safety investigations

An adverse event has been defined as 'an injury related to medical management', in contrast to complications of disease. Medical management includes 'all aspects of care, including diagnosis and treatment, failure to diagnose or treat, and the systems and equipment used to deliver care' ([WHO, 2019](#)). The patient safety system is dependent on the reporting of adverse events. The reporting of adverse events is insufficient for patient safety. After all, a patient had to be injured. Close call reporting represents a proactive approach to patient safety. A close call is a serious error that has the potential

to cause an adverse event but fails to do so because of chance or because it is intercepted (WHO, 2019). Not only are close calls hundreds of times more abundant than adverse events but they are often easier for providers to discuss because no patients were harmed.

Physicians during their training provide patient care on the front lines of healthcare. As in the story shared earlier, they are witness to conditions that threaten patients' safety, and yet, unfortunately, often do not report their observations to the healthcare organization's central reporting system. Physician participation in patient safety event analyses is associated with significant increases in their reporting of patient safety events. However, the ACGME CLER programme has demonstrated that across a large number and variety of clinical learning environments, only a limited number of residents and fellows are included in patient safety event analyses (Co et al., 2018).

Patient safety education requires that we learn from adverse events and close calls to prevent recurrence of these same events. Patient safety event analyses are performed on those adverse events or close call reports prioritized for further consideration based on the probability and severity (real or potential) of the event. An interprofessional team examines the medical record, interviews staff involved in the incident, reviews literature and guidelines, and determines the underlying systems-based factor(s) contributing to the event. Actions to address the root cause(s) are developed and implemented, along with a plan to monitor whether such actions were successful in preventing a recurrence.

Medical teachers can provide learners the necessary tools to succeed as a member or leader of a patient safety event analysis team, including the ability to create flow diagrams for event mapping and cause and effect diagrams to analyse patient safety incidents. Learning outcomes for root cause analysis knowledge and skills can be reliably assessed using validated Observed Structured Clinical Examinations (OSCEs) (Gupta & Varkey, 2009). Patient safety case conferences, mock patient safety event analyses, and case studies may serve as educational adjuncts, but not as replacements, for real, interprofessional patient safety event analysis experience. The deliberate inclusion of postgraduate physicians in patient safety event analyses requires the collaboration of leaders from medical education, patient safety, and the executive offices of healthcare organizations.

Learner integration into a healthy patient safety culture

Systems approach. James Reason states that human errors in healthcare can be viewed in one of two ways: a 'person approach' or a 'systems approach' (Reason, 2000). The person approach views adverse events as caused by an individual provider's carelessness. In this model, the involved provider is 'shamed, blamed and retrained.' However, this approach does not prevent a recurrence of a similar adverse event. The systems approach accepts that physicians are fallible and that errors will occur but acknowledges the underlying latent, organizational, environmental and device factors that made the error more likely to occur in the first place. The 'Swiss cheese' diagram (Reason, 2000) illustrates the systems approach to error (Fig. 28.1). In this model, the patient safety system consists of multiple slices of Swiss cheese. One slice might

represent automation, another teamwork, and yet another policy. Automation, like barcoding, helps prevent medication errors, and team training improves communication. However, these barriers intended to prevent errors from reaching the patient are not perfect. They have holes, and under a set of circumstances, the holes in the barriers line up so that the error reaches the patient. Holes or vulnerabilities include ineffective or ambiguous policy, automation failure or its unintended consequences, and lack of recurrent team training.

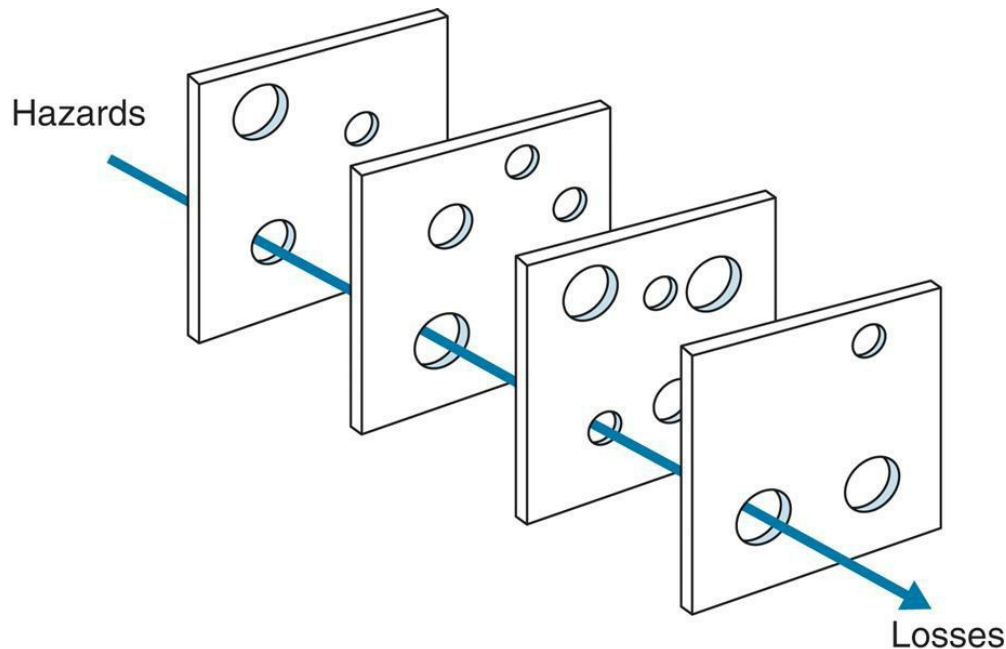


FIG. 28.1 Swiss cheese model. (From Reason, 2000.)



Tip

Understanding the systems approach to problem solving in healthcare is foundational for early learners. Although didactic lectures and case conferences can help prepare the learner, the best method to teach a systems approach is by involving learners in patient safety event analyses of real events.

Just and fair culture. The reporting of adverse events and close calls are dependent on the establishment of a just culture. A just culture is an atmosphere of trust in which people are encouraged to speak up with safety-related information. Individuals trust they will not be held accountable for system failures and are clear about where the line must be drawn between acceptable and unacceptable behaviour. Case studies where learners decide whether a course of action represented nonblameworthy human error, at risk behaviour, or a blameworthy deliberately unsafe act may be useful.

Learner acquisition of teaming skills. Patient care is a highly complex endeavour. It involves healthcare organizations providing the best care possible while continuously learning and trying to improve. As in the case of patient safety analysis team, individuals from a variety of roles and different disciplines come together transiently to solve a problem to promote organizational learning and improvement. Amy Edmondson has introduced the concept of 'teaming' to describe "teamwork on the fly" ([Edmondson, 2012](#)). She further describes teaming as 'largely determined by the mindset and practices of teamwork, not by the design and structures of effective teams'. Medical teachers can prepare learners for clinical practice by ensuring that they have achieved competence in teamwork skills, patient safety behaviours that are transportable to any situation that they might encounter. Two teamwork behaviours are speaking up with a concern and maintaining situational awareness.

The root cause for most serious adverse events in healthcare relates to a failure in communication. Team training encourages everyone to speak up with concerns, even when faced with an authority gradient. Teamwork and communication tools and techniques can be practised with simulation ranging from simple role-plays to more sophisticated high-fidelity simulations. Team training is more effective when incorporated into the healthcare system as a recurring phenomenon as opposed to a one-time workshop. Teamwork skills can be evaluated in vivo or during simulated scenarios using validated global instruments, behaviourally anchored rating scales, or event-based tools ([Guise et al., 2008](#)).

Learner understanding of human factors principles. Human factors represent 'the study of the interrelationship between humans, the tools and equipment they use in the workplace and the environment in which they work' ([Hignett et al., 2015](#)). Patient safety is concerned with threats to patients and providers from environmental, equipment, biological and chemical sources. Including Human Factors Engineering experts on medical school faculty and patient safety analysis teams will lead to a deeper appreciation of human factors among clinical care teams and stronger actions to address the causes of patient safety events.

Introduction to healthcare quality

The end goal for any patient safety issue is quality improvement. Calls for physician involvement in quality improvement have been long standing; dating back as far back as Sir Thomas Percival (most known for his code of medical ethics) who in the 1800s called for physicians to maintain registries of the work they do for the purposes of quality audit. Similarly in the 1800s Florence Nightingale called for the need to document the quality of care through the emerging field of epidemiology. In the mid-1800s, a Viennese physician, Ignaz Semmelweis, identified through observations that hygienic practices (washing hands) were associated with patient outcomes; a quality concern that continues to vex healthcare to this day. In the 1900s Earnest Codman, a Boston surgeon, called for the maintaining of patient registries and that payment should be linked to the quality of patient outcomes.

Although there are many theories and methods for quality improvement that are currently being used around the world, it seems that the most accessible and easiest to initiate for early learners, such as medical students, residents, and faculty, is the Model for Improvement ([Langley et al., 2009](#)) with its set of simple questions and use of the Shewhart (Plan-Do-Study-Act (PDSA)) cycles, (see [Fig. 28.2](#)).

What are we trying
to accomplish?

How will we know
that a change is an
improvement?

What changes can we
make that will result
in improvement?

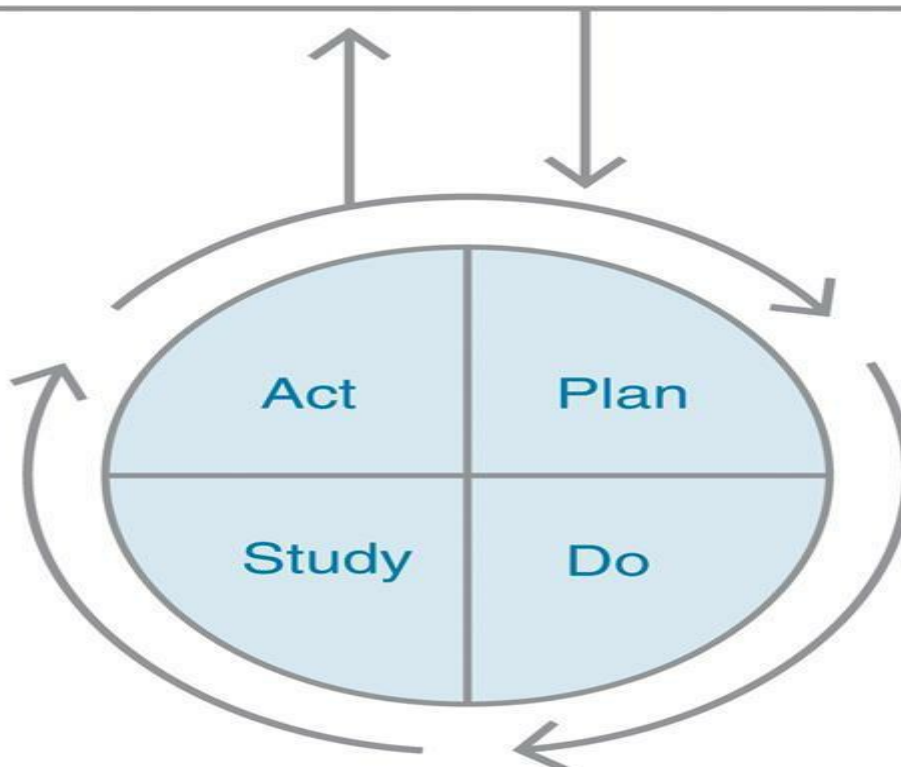


FIG. 28.2 Model for improvement. (From [Langley et al., 2009](#).)

The Institute of Medicine of the National Academy of Sciences in the United States dramatically heightened the focus on the issues of healthcare quality and patient safety through two seminal publications that declared that patients were being unnecessarily harmed and healthcare was in urgent need of improvement. By the turn of the century, the movement for both healthcare quality improvement and patient safety became global.

Teaching healthcare quality and patient safety

A continuum of physician professional development in quality and safety

Creating and sustaining the high quality, safe care that our patients need and deserve requires physicians and other health professionals to improve healthcare and patient safety as a core part of professional practice. Like other professional competencies, excellence in quality and safety demands a continuum of professional development.

By medical school graduation, physicians should be able to: (1) critically evaluate the knowledge base supporting good patient care; (2) determine the gap between prevailing practices and best practices; (3) demonstrate knowledge of how to report patient safety events; and (4) participate in closing the gap between prevailing and best practices ([Association of American Medical Colleges, 2019](#); [Edgar et al., 2018](#)). The resident about to enter practice must be able to conduct analyses of patient safety events, offer error prevention strategies, disclose patient safety events to patients and families, and demonstrate the skills required to identify, develop, implement and analyse a quality improvement project ([Edgar et al., 2018](#); [Accreditation Council for Graduate Medical Education \(2019\)](#)). The proficient practicing clinician incorporates feedback into practice, works effectively as part of interprofessional efforts to improve quality and safety, and views improving systems of care as an integral component of professional identity ([Association of American Medical Colleges, 2019](#); [Edgar et al., 2018](#)).

Strategies for teaching quality and safety

The following five principles are helpful in the design of learning experiences related to quality and safety across multiple levels of physician development ([Armstrong et al., 2012](#); [Co et al., 2018](#); [Passiment et al., 2019](#); [Wong et al., 2020](#)):

1. Use a combination of didactic and experiential learning strategies. Improving healthcare quality and safety requires competencies that must be practised with opportunities for feedback and reflection. For example, Jamal and colleagues compared otolaryngology residents who participated in a yearlong patient safety/quality improvement curriculum that included both didactic and project work (intervention group) with residents who experienced a traditional morbidity and mortality conference-based patient safety/quality improvement education (control group). Only the residents in the intervention group demonstrated improvement in patient safety/quality improvement confidence and knowledge at the end of the year ([Jamal et al., 2019](#)).
2. Find ways to include interprofessional learning, because interprofessional collaboration is key to quality improvement and patient safety. It is a truism in quality improvement that one cannot effectively improve someone else's process. Although some aspects of quality improvement and patient safety

might be learned in discipline-specific activities, successful changes in practice require the ability to engage everyone involved. Bodenheimer and colleagues studied clinic-based patient safety/quality improvement education in 44 Internal Medicine and Family Medicine residency programmes. They found the highest performance in terms of resident response and sustained practice improvements when quality improvement projects aligned with practice priorities *and* included interprofessional teamwork ([Bodenheimer et al., 2019](#)).



Tip

Training in patient safety sciences and quality improvement needs to be continual throughout training, thereby modelling this as a part of normal professional expectations rather than as a task to be conducted to complete training.

3. Remember that clinically based learning is usually more powerful than classroom-based learning. In their landmark report, *Calls for Reform of Medical Education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010*, Irby and colleagues call for the integration of formal learning with clinical experience, citing the advantages of medical education processes that closely represent the nature of physicians' learning and work ([Irby et al., 2010](#)). Unless education occurs in clinical settings marked by high-quality safe practices and culture, learners may adopt behaviours that replicate suboptimal clinical outcomes throughout years of future practice ([Wong et al., 2020](#)).
4. Take advantage of the power that comes when one aligns with clinical quality improvement efforts. The ACGME's CLER reports of site visits to US academic teaching centres repeatedly highlight the value of shared goals and strategies between education and clinical leadership ([Co et al., 2018](#)). Learner-generated improvement efforts may at first seem exciting, but they are difficult to sustain if they are not synchronized with organizational priorities and thus fail to attract partners and other resources. These resources include timely and pertinent data, time and attention from both faculty and clinical leaders, and the power to test change in the clinical setting. Unsustainable projects may leave learners disheartened about improvement work. Coalescing education and clinical improvement efforts around shared goals can generate both important learning experiences and demonstrable benefit to patients ([Van Schaik et al., 2019](#)).
5. Role model improvement in both clinical care and education. Faculty demonstrate the importance of measurement, feedback and improvement by incorporating these into their own work in a way that is visible to learners. This includes modelling the inclusion of patients and families in safety and improvement efforts at both the individual and organizational level ([Association of American Medical Colleges, 2019](#); [Van Schaik et al., 2019](#)).

Health professions educators have created learning experiences in quality

improvement and patient safety in the classroom, the simulation centre, and in clinical settings (Headrick et al., 2012). Examples include learners using a paper case to work through the steps of a quality improvement project, practicing safe handoffs in the clinical simulation centre, and taking on a defined aspect of a larger improvement effort in a way that can be integrated into learners' activities and obligations. Achieving the complex competencies required to improve patient care and safety requires a series of learning experiences over time, perhaps starting in the classroom but progressing rapidly to clinically based activities.

Learner assessment and evaluation

Strategic measurement provides feedback to both learners ("How have I progressed?") and educators ("How well did these strategies meet our goals?"). As modified by Barr and colleagues, the Kirkpatrick typology of educational outcomes describes a comprehensive approach that addresses learner, organizational and patient outcomes (Barr et al., 2005). Table 28.1 provides details, examples, and selected peer-reviewed resources.

Table 28.1 Typology of educational outcomes for learner assessment and programme evaluation

| Outcome | Example | Selected peer reviewed resources |
|---|--|--|
| 1. Learner reaction | Written feedback | Minute paper (Singh et al., 2011) |
| 2a. Modification of attitudes/perceptions | Pre-/postlearner assessment | QICI (Hess et al., 2013) |
| 2b. Acquisition of knowledge/ skills | Pre-/postlearner assessment | QIKAT-R (Singh et al., 2014) |
| 3. Behavioural change | Checklist-driven faculty ratings of learner performance in the clinical setting; documentation of learner activities | C3QS (Nagy et al., 2015) |
| 4a. Change in organizational practice | Improvements in clinical processes | Clinical Microsystem Assessment Tool (Johnson, 2003) |
| 4b. Benefits to patients/clients | Clinical outcomes | AHRQ Quality Tools and Resources |

AHRQ, Agency for Healthcare Research and Quality (<https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/index.html>), C3QS, Common Core Curriculum for Quality and Safety; QICI, Quality Improvement Confidence Instrument; QIKAT-R, Quality Improvement Knowledge-Acquisition Tool, Revised.

Challenges to establishing a patient safety and healthcare quality educational programme

Listed are a few of the common challenges encountered by educators seeking to build successful learning experiences in quality improvement and patient safety.

1. Meaningful clinical improvement experiences for all learners probably requires the integration of quality improvement and patient safety into core clinical practice (the way we do our work every day).
2. Exhortations for learners to prioritize patient safety/quality improvement activities lack meaning unless faculty members are practicing and teaching patient safety/quality improvement in the context of their work as clinicians, educators, and researchers. Successful education requires explicit attention to faculty development.
3. Patient safety and healthcare quality take place in the complex learning environment that we call clinical care. Aligning education and clinical improvement efforts increases the chance that learners will experience successful change as it is designed, implemented and sustained.



Tip

Healthcare educators need to work closely with healthcare system leaders to design and implement healthcare quality and patient safety education programmes.

Summary

Patient safety and quality improvement knowledge, skills, and behaviours are fundamental to high-quality and safe patient care, and, as such, are essential elements of medical education. Teachers have increasingly assimilated patient safety and quality improvement education into medical school and graduate medical curricula. Patient safety and quality improvement education requires prepared faculty in close collaboration with patient safety and quality improvement personnel and other members of the clinical care team. The involvement of early learners in a real patient safety event analysis is a transformative experience leading to improved engagement in patient safety activities, patient safety reporting, and embrace of the patient safety culture. Likewise, quality improvement teaching is best when experiential, involving other members of the frontline healthcare team, and demonstrated in everyday clinical work by medical teachers that early learners look up to. Excellent, validated resources now exist to guide medical teachers responsible for patient safety and quality improvement education in both education design and learner assessment.

References

- Accreditation Council for Graduate Medical Education, 2019 Accreditation Council for Graduate Medical Education. (2019) Milestones by Specialty. <https://www.acgme.org/What-We-Do/Accreditation/Milestones/Milestones-by-Specialty> (accessed December 7, 2019).
- ACGME, 2016 ACGME (2016). CLER National report of findings. Issue Brief No. 2. Patient safety. Retrieved from: https://www.acgme.org/Portals/0/PDFs/CLER/ACGME_CLER_Patient_Safety_Digital.pdf.
- Armstrong et al., 2012 Armstrong G, Headrick LA, Madigosky W, Ogrinc G. Designing education to improve care. *The Joint Commission Journal on Quality and Patient Safety*. 2012;38(12):5–14.
- Association of American Medical Colleges, 2019 Association of American Medical Colleges. *Quality Improvement and Patient Safety Competencies Across the Learning Continuum*. AAMC New and Emerging Areas in Medicine Series Washington, DC: AAMC; 2019; 2019. Available at <https://store.aamc.org/quality-improvement-and-patient-safety-competencies-across-the-learning-continuum.html> (Accessed December 7, 2019).
- Barr et al., 2005 Barr H, Koppel I, Reeves S, Hammick M, Freeth DS. *Effective interprofessional education: argument, assumption and evidence* Oxford, UK: Blackwell Publishing; 2005.
- Bodenheimer et al., 2019 Bodenheimer T, Dickinson WP, Kong M. Quality improvement models in residency programs. *Journal of Graduate Medical Education*. 2019;11(1):15–17.
- Co et al., 2018 Co JT, Weiss KB, Koh NJ, Wagner R. *CLER Program. CLER National Report of Findings 2018: Executive Summary* Chicago, IL: Accreditation Council for Graduate Medical Education; 2018.
- Edgar et al., 2018 Edgar L, Roberts S, Holmboe E. Milestones 2.0: A step forward. *Journal of Graduate Medical Education*. 2018;10(3):367–369.
- Edmondson, 2012 Edmondson AC. *Teaming How organizations learn, innovate, and compete in the knowledge economy* San Francisco, CA: Jossey-Bass; 2012.
- Guise et al., 2008 Guise JM, Deering SH, Kanki BG, et al. Validation of a tool to measure and promote clinical teamwork. *Sim Healthcare*. 2008;3:217–223.

- Gupta and Varkey, 2009 Gupta P, Varkey P. Developing a tool for assessing Competency in root cause analysis. *The Joint Commission Journal on Quality and Patient Safety*. 2009;35(1):36–42.
- Headrick et al., 2012 Headrick LA, Barton AJ, Ogrinc G, et al. Results of an effort to integrate quality and safety into medical and nursing school curricula and foster joint learning. *Health Affairs (Millwood)*. 2012;31:2669–2680.
- Hess et al., 2013 Hess BJ, Johnston MM, Lynn LA, Conforti LN, Holmboe ES. Development of an instrument to evaluate residents' confidence in quality improvement. *Joint Commission Journal on Quality & Patient Safety*. 2013;39(11):502–510.
- Hignett et al., 2015 Hignett S, Jones EL, Miller D, et al. Human factors and ergonomics and quality improvement science: Integrating approaches for safety in healthcare. *BMJ Quality and Safety*. 2015;24:250–254.
- Irby et al., 2010 Irby DM, Cooke M, O'Brien BC. *Calls for reform of medical education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010*. *Academic Medicine*. 85 2010;220–227.
- Jamal et al., 2019 Jamal N, Bowe SN, Brenner MJ, Balakrishnan K, Bent JP. Impact of a formal patient safety and quality improvement curriculum: a prospective, controlled trial. *Laryngoscope*. 2019;129(5):1100–1106.
- Johnson Johnson J.K. Clinical Microsystem Assessment Tool. Revised 2/21/03. Available at http://clinicalmicrosystem.org/uploads/documents/microsystem_assessment_tool.pdf Accessed December 8, 2019.
- Langley et al., 2009 Langley GJ, Moen R, Nolan KM, Nolan TW, Norman CL, Provost LP. *The improvement guide: a practical approach to enhancing organizational performance* 2nd ed. San Francisco: Jossey-Bass Publishers; 2009.
- Nagy et al., 2015 Nagy CJ, Zernzach RC, Jones WS, Higgs JB, Bowe SN, Bossg RA. Common core curriculum for quality and safety: a novel instrument for cultivating trainee engagement in quality improvement and patient safety. *Journal of Graduate Medical Education*. 2015;7(2):272–274.
- Passiment et al., 2019 Passiment M, Wagner R, Newton RC, Weiss KB. The CLER pursuing excellence pathway leaders collaborative: enhancing resident and fellow engagement in patient safety. *Journal of Graduate Medical Education*. 2019;11:618–620.

- Reason, 2000 Reason J. Human error: models and management. *British Medical Journal*. 2000;320:768–770.
- Singh et al., 2011 Singh MK, Lawrence R, Headrick LA. Expanding educator's medical curriculum tool chest: Minute papers as an underutilized option for obtaining immediate feedback. *Journal of Graduate Medical Education*. 2011;3(2):239–242.
- Singh et al., 2014 Singh MK, Ogrinc G, Cox K, et al. Quality Improvement Knowledge Application Tool Revised (QIKAT-R). *Academic Medicine*. 2014;89(10):1386–1391.
- Van Schaik et al., 2019 Van Schaik SM, Reeves SA, Headrick LA. Exemplary learning environments for the health professions: a vision. *Academic Medicine*. 2019;94(7):975–982.
- Wong et al., 2020 Wong BM, Baum KD, Headrick LA, et al. Building the bridge to quality: an urgent call to integrate patient safety and quality improvement education with clinical care. *Academic Medicine*. 2020;95(1):59–68.
- World Health Organization, 2019 World Health Organization (2019). Patient safety. Retrieved from: <https://www.who.int/patientsafety/en/>.

Medical Humanities

Julie Y Chen and Harry Yi-Jui Wu

Trends

- Medical humanities curricula are increasingly global in scope, as well as in locality.
- Medical humanities have a role in professional identity formation and wellbeing.
- Technology and e-learning can enhance medical humanities education.

Definitions

- Resilience: students in the health professions are immersed in challenging environments and resilience, the capacity to adapt to adversity and rebound from setbacks, enables them to better handle stress.
- Professional identity formation: as students internalize the characteristics, values and norms of their profession during the course of their education, they develop a progressive representation of self, resulting in their thinking, acting, and feeling like a physician.
- Perspectivism: in healthcare, approaches and therapies that do not address patients' ideas and fears may not be successful and perspectivism, where individual points of view are explored and respected, allows for a more meaningful doctor-patient clinical encounter and outcome.

Introduction

The fundamental remit of medical schools is to nurture the development of future healthcare professionals who will provide safe, competent care. This includes proficiency in the biomedical realm with the requisite clinical skills, but must also comprise the attributes, attitudes and broad perspective drawn from humanistic fields of study to understand illness in patients' own personal contexts.

Understanding the patient as a person and the individuality of illness and suffering is the first step towards relieving suffering, arguably the primary goal of medicine (Cassell, 1999). Whatever illness a person has, the issues concerning the human condition are the ones that matter most, whether they be suffering, death, love or friendship. The medical humanities (MH) have been recognized and adopted in myriad ways in medical education as a means to emphasize, celebrate and critically explore the human aspect of medicine.

What are the medical humanities?

There is no universally agreed definition of the MH. Scholars in the field have suggested their conceptualizations from different perspectives. They encompass disciplines whose subject matter spans ethics to art to philosophy, provide a set of goals in medical education, leading to greater insight into the human experience in relation to health and illness, coalesce into a programme of moral development for acquiring the values of good doctoring, and serve as a supportive friend to whom we turn for enjoyment and wisdom ([Bleakley, 2015](#); [Gordon & Evans, 2013](#))

How do the medical humanities contribute to medical education?

In addition to bringing balance to the biomedical focus of the medical curriculum, MH are useful for their 'instrumental role' in preparing students for clinical practice and also for their intrinsic value in broadening perspective and in personal development (Macnaughton, 2000).

Preparation for medical practice



"You never really understand another person until you consider things from his point of view ... until you climb inside of his skin and walk around in it."

Harper Lee

MH provide vicarious life experience through stories told through various narrative forms. Encountering the loss of a parent, the darkness of depression, or the feelings about dissecting a cadaver through stories, and reflecting on personal responses in a safe environment can help reveal hidden fears and internal biases, and 'prepare' students before they encounter these situations in clinical setting. Through drama or visual arts, students can learn to interpret emotions and reflect on the communication between individuals and to practise verbal and nonverbal communication skills.

Perhaps importantly, the MH take a critical approach to stimulate deeper thinking and reflection as the nature and practice of medicine evolves. They ask us to examine: "What makes us human?"; "What gives our lives meaning?"; "What is the nature of suffering?" In tackling these questions, students generate new inquiries and reflections, which build awareness to equip them better to face the complexities and ambiguities of issues involved in medical care and practice.

Personal development, resilience and wellbeing

The MH provide a wider lens with which to view the world, beyond the concentrated focus of medical training. Through the MH, students can observe and uncover knowledge about patients, themselves and their own values and challenge preconceived beliefs (Macnaughton, 2000), thereby developing an increasing sense of self-awareness.



"As physicians we owe our patients two —only two things—our time and our skill. We do not owe our patients our lives."

Self-awareness is a prerequisite for self-care necessary in the prevailing climate of medical education and medical practice. This climate is characterized by unrelenting professional demands and expectations, leading to burnout and other psychologic distress. Beginning with self-awareness, students can learn to be humane to themselves and to their colleagues, to recognize the limits of their expertise and to accept that they are human. MH in their capacity for personal development can also provide guidance, opportunity and permission for medical students to better look after their health and build resilience with a body of literature supporting the positive effects of the arts, reflective writing, and arts-based therapies.

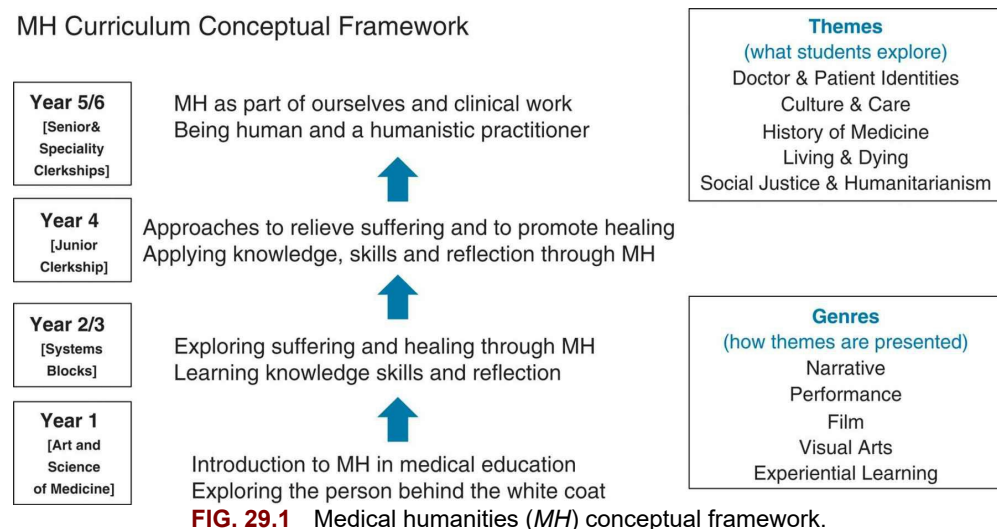
Professional identity formation

Medical students form their professional identities as they progress through medical school, learning to 'be' a doctor by absorbing and internalizing formal and informal experiences. MH have been increasingly recognized as fertile ground for building students' reflective capacity to process these experiences. Analysis of medical students' work, as guided reflective writing about challenging patient encounters ([Wald, White, Reis, Esquibel, & Anthony, 2018](#)) and mandalas (art created within or with reference to the form of a circle) drawn to express an emotional state ([Potash, Chen, & Tsang, 2016](#)), have both shown evidence of emerging professional identity formation.

Curriculum structure: Hong Kong University medical humanities programme case example

Framework

The MH programme at Hong Kong University (HKU) is underpinned by a conceptual framework that begins with knowledge and self-exploration, then progresses to skill development, and finally to embodiment of attitudes and behaviours nurtured through MH in clinical practice (Fig. 29.1). It is a 6-year, compulsory longitudinal curriculum built around five designated themes (doctor and patient identities; culture and care; history of medicine; living and dying; and social justice and humanitarianism), that are explored through five genres (narrative and literature, film, performance, visual art and experiential learning).



Outcomes-based approach to student learning

A MH activity or curriculum can be designed and structured in a pedagogically rigorous way. The outcomes-based approach to student learning (OBASL) is based on sound educational principles and also reflects the competency-based curriculum design already in place in many medical schools. In OBASL, the curriculum design is centred on clearly stated learning outcomes. The expected outcomes govern what kind of teaching and learning activities are constructed, and the assessment task is then designed to assure that the outcomes are met. It makes the planning of the activity, course or programme explicit, focused and accountable. The interdependence of outcomes, learning activities and assessment is shown in (Fig. 29.2), using one of the learning outcomes of the Year 1 MH curriculum at HKU to illustrate the curriculum

alignment.

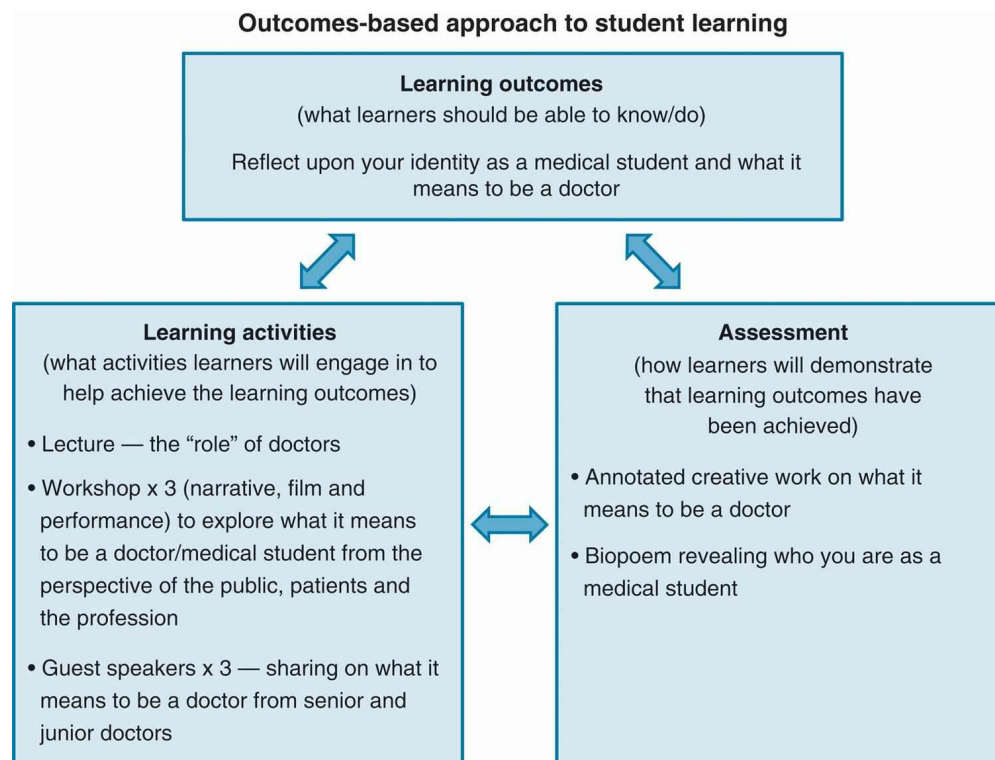


FIG. 29.2 Example of outcomes-based approach to student learning in medical humanities.

Assessment

The learning outcome desired for a particular MH initiative will determine the form of assessment. Skills-based outcomes, such as reflection or to critical appraisal can be assessed using conventional or creative means, such as essays, reflective logbooks or presentations based on desired rubrics. For example, a biopoem, a self-reflective poem based on a set structure was used for assessment in a narrative workshop aimed at exploring the question: “Who am I?” On the other hand, attitudinal and behavioural outcomes, such as empathy or compassion, are harder to measure through portfolios, reflective writing and artwork can be useful. In our compassion workshop, a body mapping exercise is used for assessment. Students explore how emotions may affect the doctor-patient relationship in a given scenario (e.g., an unexpected death) by drawing and explaining their body map: two students adopt a posture that represents the doctor-patient relationship and the life-size outline of their bodies is traced onto a sheet of paper for participants to reflect on the emotions each may be feeling.

Integration

A structured MH programme engaging teachers across disciplines as part of the core

medical curriculum underscores the relevance and importance of the MH to medical study and practice. MH-aligned learning activities in other areas of the curriculum that complement the structured programme can be curated into an overarching MH initiative (Peterkin, 2016). In the preclinical years, this may include a cadaver respect ceremony as part of the anatomy course or using a patient's narrative as a trigger scenario for a problem-based learning case in the preclerkship years. In clinical years, MH can be embedded in the clinical teaching and learned experientially. For instance, encounters with suffering during a clinical clerkship (whether it be an unexpected diagnosis or an elderly woman's depression) can be debriefed and discussed with reference to Eric Cassell's article on the nature of suffering (Cassell, 1999). Among clerkship preparatory readings at the University of Washington is a poem about a patient who appeals to his doctors to be seen as a person (*When you come into my room* by Stephen A Schmidt) and a story about the most uninteresting patient on the ward who turns out to be not so uninteresting (*Curiosity* by Faith T Fitzgerald), and in residency programmes, shared stories are incorporated into hospital rounds (http://www.nytimes.com/2008/10/24/health/chen10-23.html?_r=0), all of which bring the MH to the clinical realm.

Compulsory or elective

How the MH are positioned in the curriculum is dependent on the educational philosophy of the institution and on practical considerations like curriculum time and resourcing. More often, programmes in undergraduate medical education offer the MH as course electives or special study modules allowing students to pursue new areas of interest. In contrast, MH can also be a compulsory discipline as part of their core medical education subject to summative assessment. A hybrid approach adopted at HKU, maintains mandatory core components but incorporates a suite of complementary options (including self-initiated options) aligned with the learning outcomes of the programme, and combines the benefits of both options.

Content and delivery



"I listen not only for the content of his narrative, but for its form — its temporal course, its images, its associated subplots, its silences, where he chooses to begin in telling of himself, how he sequences symptoms with other life events."

Rita Charon

Narrative based

Narrative medicine is about developing the textual, creative and affective skills through close reading of text to be able to recognize, absorb, interpret and be moved by the stories of illness (Charon, 2004) in a therapeutic alliance with patients to make meaning

of illness and move towards healing. The study of narratives exposes students to different explanatory models of suffering and healing from different perspectives and can be revealed through various written narrative forms as short stories, novels, poetry, or visual forms like painting, photographs or film. Students are compelled to see and experience life from different angles by writing, sharing, reading or actively listening to stories, either factual or fictional.

In addition to guided close reading and analysis of text and responding verbally or in writing, students can create alternative forms to respond to the narrative. Students can, for instance, make comic strips or a micromovie to explore the significance of 'perspectivism' (Kleinman, 1988) triggered by watching a video in which various perspectives of disease causation or treatment contest each other. The scene between the doctor and patient about his diagnosis in the film *Angels in America*, is a powerful juxtaposition of explanatory models of illness from the perspectives of healthcare provider, public health planner, patient and activists of marginalized community. By exploring the intersubjectivity of these narratives, students use their moral imagination ("What would I do if I were in the same situation?"), examine their affective reactions ("How does this interaction make me feel?") and realize the complexity and challenges in their clinical and social roles. Useful narrative-based material for teaching can be found in Narrative Matters in *Health Affairs* and A Piece of My Mind in the *Journal of the American Medical Association* as well the online NYU Literature Arts Medicine Database (<http://medhum.med.nyu.edu>).

Arts based

Aesthetic education is concerned with the process of perceptually engaging with something new, of being introduced to media that are originally unfamiliar to learners and nurtures an intensified awareness for various aspects of humanity (Beardsley, 1982). Regarding medical training, it helps students to sharpen their perception and gaze into body structure and the image of disease/disability. It also helps discover new ways of looking at, listening to, moving in and speaking of illness or healing experiences. Because aesthetic quality is inherent in art, various arts-based approaches can all be useful media to develop aesthetic awareness. Visual analysis of portraits can help students observe and reflect on the state of mind and emotional state of a person. If time allows, the iconography of disease can introduce how stereotypical images of disease are created to reflect social values (Gilman, 1987) and how stigma is shaped in a highly racialized society.

Technology and e-learning

In the digital era, e-based modalities can be harnessed to learn MH, especially for large classes or in distant attachments. For example, digitizing a live verbatim play in undergraduate medical education (D'Allesandro & Frager, 2017) or the exploration of illness narratives through written and multimedia applications supplemented with interactive online discussion forums or using e-portfolios are all possibilities. However, the opportunities created for face-to-face debates and the conflicting values generated

through the dynamics of direct discussion in conventional humanities classes are difficult to replicate in the e-learning environment. A blended learning approach might be useful to incorporate the best of both worlds.

Experiential learning

Mindful practice

The themes of self-care, spirituality and healing are common in MH curricula and may take the form of mindful practice. Mindfulness is the quality of having moment-to-moment nonjudgemental awareness. Through guided workshops and immersing themselves in the practice, medical students can acquire techniques to develop self-awareness, reduce psychologic distress and improve clinical interpersonal skills, such as attention, awareness and compassion. In addition, mindful practice is also useful to examine the dynamics between oppression and suffering, hence enhancing students' capacity to approach problems with principles of social justice ([Hick & Furlotte, 2009](#)).

Historical visits

Through history of medicine, students gain a sense of why contemporary medicine is practised the way it is, which contributes to the development of their collective professional identity. Reading, hearing about and discussing significant historical events, such as the plague outbreak in Hong Kong in 1894, help students see parallels in how crises are handled in comparison with the SARS outbreak in 2003 and COVID-19 in 2020, how cultural beliefs and racialized thinking affected medical care and the public health changes that came about as a result. Visiting places where events took place add a new dimension. Places make connections across time, giving them a unique ability to create an empathetic understanding of what happened and why, considering various social, cultural, economic and political determinants.

Service learning

Service learning is an educational approach to enable students to serve and to encourage the desire to serve. As part of MH curricula, service learning provides pragmatic opportunities to explore social justice and humanitarianism in settings where narratives of illness and pressing concerns in disease management are real and confronted directly. Such 'experiential narrative' not only helps students to further refine the reflective skills they learn in protected settings while also contributing to the community.

What are some practical considerations and challenges?

Teachers

It is difficult to define an expert MH teacher and identify who should teach MH. Teachers in such programmes bring expertise from their respective academic and professional fields or from the community and collectively enrich the curriculum. However, faculty development to standardize understanding of the intent and goals of a particular MH activity or programme is crucial. For example, teachers who are clinician-scientists may benefit from the revisiting the concepts of health and diseases from a humanities and social sciences viewpoint looking at basic historiographies of medicine, narrative representation of illness, social and cultural factors on health and diseases. (See [Box 29.1](#))

Box 29.1

Tips for developing medical humanities in the curriculum

- Draw on the expertise of the medical humanities and medical education communities, and the many resources available online and in print.
- Develop a solid conceptual framework and structure based on sound educational principles, such as outcomes-based approach to student learning.
- Base content on the needs, goals and desired outcomes of the medical curriculum in the given context of the medical school.
- Integrate with existing teaching and try to have coteaching by medical/clinical and nonmedical/clinical teachers to visibly reinforce the relevance of the medical humanities (MH) as core learning.
- Make it count so that there is explicit and tangible acknowledgement of the value of the MH learning.
- Engage students in the planning process and encourage peer-to-peer teaching to develop a sense of ownership of the programme and sustainability.
- Take a concurrent bottom-up and top-down approach as it is essential to have the Dean's support, as well as that of front-line teachers who can commit to supporting the activity/programme.
- Invest in professional development for skill-development among interested teachers, and to promote MH among those who may not know they are interested, which will help broaden the base of teachers, sustain interest and build a community of practice.
- Importantly, have a passionate champion who will drive the initiative as the process will be time and energy intensive and will undoubtedly face as many

deterrents as rewards.

Sustainability

Students often do not appreciate the relevance of the MH until they engage with patients in their senior years or in real practice. Sustainability of the curriculum is related to buy-in from the students and faculty members which is directly related to the perceived relevance of MH to clinical practice. Integrating MH in the core medical curriculum and clinical teaching normalizes it as a part of the curriculum that is not 'finished' once a course is completed. A cocreated curriculum with student participation in curriculum development and peer teaching can help develop a sense of ownership in the programme. Innovative research approaches and longitudinal follow-up to investigate the impact of MH on student and patient outcomes beyond the pre-/postcourse evaluations can provide evidence of the value of MH and support its continuation. Moreover, maintaining a critical mass of manpower to support teaching is important and can be achieved through faculty development and partnerships with nonmedical faculties, museums and art galleries, as well as alumni and retired doctors.

Changing role of doctors

Patient expectations and the scope of issues that impact practice have grown and are reflected in the evolving objectives of medical education. These now address global health issues and a wider range of social and cultural determinants of health and disease, such as the increasing costs on healthcare, inequality, health literacy in different cultures. They reflect a medical learner's role as a world citizen and responsibilities as a future doctor. In parallel with such change, the teaching and learning of MH is also evolving with the emergence specialized areas of MH. Public health humanities helps medical learners to understand, in a more nuanced way, the influence of social, cultural and financial contexts on health behaviours and to empathize with people in difficult circumstances ([Saffran, 2014](#)). Interprofessional MH introduces the model of teamwork, enhance cross-disciplinary communication and grow mutual understanding of the role different professions plays in healthcare ([Gowda, Curran, & Khedagi, 2019](#)).

Cultural and linguistic issues

All medical schools are set in communities with their own sociocultural norms and disease patterns, and the MH curriculum, like the medical curriculum, needs to reflect the community in which their graduates will practise. Employing works created by local authors, artists and filmmakers and presented in the local language may better suit the local context and resonate more strongly with students, stimulating more interest and enthusiasm.

In addition, MH can bring a focus to cultural competency that is more rigorous in explaining intricate health and disease problems. Structural competency focuses on the forces that influence health outcomes beyond individual clinical interactions to broader issues of poverty and inequality that might be shielded by presumed cultural

representations. With such an approach, students gain critical awareness of the complexity regarding realistic goals of medical treatment and care ([Metzl & Hansen, 2014](#)). For example, in Anne Fadiman's *The Spirit Catches You and You Fall Down*, it is the politics and international relations that are as critical in determining the family's resistance to modern medicine beyond their culturally-grounded help-seeking behaviour.

Summary

MH are primarily critical endeavours that explore the human condition through which the patient and doctor make meaning of health and illness through the broader perspective of the humanities, arts and social sciences but also contribute to wellbeing and personal development.

A large number of medical schools have adopted the MH in some form into their curricula, and there is great diversity in the way they are conceptualized, structured, taught and assessed.

Robust educational principles should underpin the teaching and learning, which should also be tailored to suit the context, and a variety of educational approaches can be used including narrative, arts based, experiential and e-learning.

Conceptual and practical issues include the definition and redefinition of MH, who should teach them, sustainability, evaluation of impact or effectiveness of MH teaching, and sensitivity to cultural, linguistic and realities of practice.

Acknowledgement

With immense gratitude to Professor LC Chan (1951–2015), a passionate medical educator and tireless champion of the medical humanities in the medical school curriculum at HKU and beyond.

References

- Beardsley, 1982 Beardsley M. *The aesthetic point of view* Cornell University Press 1982.
- Bleakley, 2015 Bleakley A. *Medical humanities and medical education: how the medical humanities can shape better doctors* Routledge: Milton Park; 2015.
- Cassell, 1999 Cassell EJ. Diagnosing suffering: a perspective. *Annals of Internal Medicine*. 1999;131(7):531–534.
- Charon, 2004 Charon R. Narrative and medicine. *New England Journal of Medicine*. 2004;350(9):862–864.
- D’Allesandro and Frager, 2017 D’Allesandro P, Frager G. Digital medical humanities: stage-to-screen lessons from a five year initiative. *Medical Humanities*. 2017;43:269–270.
- Gilman, 1987 Gilman S. *AIDS and syphilis: the iconography of disease*. JSTOR. 43 1987;87–107.
- Gordon and Evans, 2013 Gordon J, Evans M. Learning medicine from the humanities. In: Swanwick T, ed. *Understanding Medical Education: evidence, theory and practice*. second ed. John Wiley and Sons 2013;213–226.
- Gowda et al., 2019 Gowda D, Curran T, Khedagi A, et al. Implementing an interprofessional narrative medicine program in academic clinics: feasibility and program evaluation. *Perspectives on Medical Education*. 2019;8(1):52–59.
- Hick and Furlotte, 2009 Hick S, Furlotte C. Mindfulness and social justice approaches: bridging the mind and society in social work practice. *Canadian Social Work Review/Revue Canadienne De Service Social*. 2009;26(1):5–24.
- Kleinman, 1988 Kleinman A. *The illness narratives: suffering, healing and the human condition* New York: Basic Books; 1988.
- Macnaughton, 2000 Macnaughton J. The humanities in medical education: context, outcomes and structures. *Medical Humanities*. 2000;26(1):23–30.
- Metzl and Hansen, 2014 Metzl JM, Hansen H. Structural competency: theorizing a new medical engagement with stigma and inequality. *Social Sciences and Medicine*. 2014;103:126–133.
- Peterkin, 2016 Peterkin A. Curating the medical humanities: twelve tips. *Medical Humanities*. 2016;42(3):147–148.

- [Potash et al., 2016](#) Potash JS, Chen JY, Tsang JP. Medical student mandala making for holistic wellbeing. *Medical Humanities*. 2016;42:17–25.
- [Saffran, 2014](#) Saffran L. 'Only connect': the case for public health humanities. *Medical Humanities*. 2014;40(2):105–110.
- [Wald et al., 2018](#) Wald HS, White J, Reis SP, Esquibel AY, Anthony D. Grappling with complexity: Medical students' reflective writings about challenging patient encounters as a window into professional identity formation. *Medical Teacher*. 2018;41(2):152–160.

Integrative Medicine in the Training of Physicians

Aviad Haramati, SR Adler, R Teets and B Kligler

Trends

- Graduating physicians need to be knowledgeable about complementary and integrative medical (CIM) practices so they can advise their patients about the judicious use of these therapies to improve health and healing.
- Most medical schools include aspects of CIM in the curriculum to achieve learning outcomes in knowledge acquisition and clinical skills building about CIM, and innovative institutions are including experiential mind-body medicine sessions to foster self-awareness and self-care of the students and faculty.
- The incorporation of integrative medicine in clinical training can be synergized with other elements, such as interprofessional education and cultural competency to create robust clinical skills examinations.
- Integrative medicine is becoming an important component of the curriculum in residency training programmes focusing on primary care, and fellowship training is evolving the field into a subspecialty designation.

Key concepts

- Complementary and integrative medicine (CIM): therapies from healing traditions that are being used in conjunction of conventional care to optimize health and healing.
- Mind-body therapies: practices, such as meditation, guided imagery, breathing exercises, used to reduce stress and promote resilience and wellbeing.
- Body-based therapies: practices, such as chiropractic and osteopathic manipulation, massage, used to alleviate pain.
- Biologically based therapies: practices that are taken by mouth, such as nutritional supplements, herbs and botanicals, and the incorporation of various diets.
- Movement-based therapies: practices involving movement, such as tai chi, qi gong and yoga, used in a variety of conditions.
- Integrative medicine in residency (IMR) programme: developed at the University of Arizona, the IMR programme is a 200-hour online curriculum on various areas of and integrative medicine designed to be incorporated into any primary care residency programme.

Introduction

In virtually all developed countries that practice conventional Western medicine, a significant percentage of the public seeks complementary and integrative medicinal practices (CIM) to enhance health and healing. These include mind-body therapies, such as meditation, imagery, and spirituality; body-based therapies, such as chiropractic and osteopathic manipulation and massage; nutritional supplements, herbs and botanicals; energy healing interventions, such as Reiki and acupuncture; and systemic approaches, such as Traditional Chinese Medicine (TCM), Ayurvedic Medicine, and many other traditional and indigenous healing rituals.

The past 30 years has seen the emergence of integrative medicine in which the physician, working usually with a team of practitioners, seeks to combine the best approaches from both conventional and complementary therapies to treat illness and foster wellbeing. Integrative medicine, as defined by the Academic Consortium for Integrative Medicine and Health, reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing. In this chapter, we will explore the rationale for teaching future physicians about integrative medicine in medical school, and the strategies that have been used to incorporate integrative medicine into undergraduate and graduate medical education.



"Integrative medicine reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing."

Academic Consortium for Integrative Medicine and Health (2004)

Integrative medicine in undergraduate medical education

The rationale for incorporating integrative medicine into the medical school curriculum is that graduating physicians should be able to understand advances in the CIM field and provide guidance to their patients on what works, what is dangerous and what seems to be of no use. Thus in most academic institutions around the world, there is at least a mention of CIM within the curriculum, although the amount of time and degree of depth with which these elements are taught varies widely. In 1999 the National Center for Complementary and Alternative Medicine (now the National Center for Complementary and Integrative Health) at the National Institutes of Health in the United States provided significant funding to 14 conventional medical and nursing schools to develop curricula and exemplars for incorporating CIM into the training of health professionals. The lessons learned were summarized in a series of articles published in *Academic Medicine* in 2007 and disseminated at international conferences, especially those focusing on medical education. The significance of that initiative, along with others published in a number of countries, is that many more institutions were willing to bring CIM into their classrooms and clinics.



"Graduating physicians should be able to understand advances in the CIM field and provide guidance to their patients on what works, what is dangerous and what seems to be of no use"

Preclinical years

Kligler et al. published a recommended set of competencies in integrative medicine for medical school curricula, and delineated knowledge, skills, attitudes and values that educators from 23 academic health centres felt were fundamental to the field (Kligler et al., 2004). Most schools focus on teaching students about CIM, and how to work interprofessionally with CIM practitioners. In the preclinical years, several institutions have been able to create a seamless integration of content into the required course structure. Thus lectures on acupuncture and other nonpharmacologic approaches to management of pain appear in neuroscience and in physiology; manipulation and massage might be added to an anatomy course, and mindfulness meditation becomes part of the discussion on the physiology of stress—with the focus on how to reduce stress. Virtually all pharmacology courses now include material on herbs and botanicals. This information serves not only to educate students on the most common nonvitamin, nonmineral supplements that their patients may be taking, but also to caution on potentially serious herb-drug interactions that might ensue, especially if the patients are not inclined to inform their healthcare provider of what they are taking.

Including CIM in the medical curriculum can also help achieve educational goals

regarding understanding patient preferences and cultural competence. In this regard, many schools have included CIM in their 'doctoring' courses on the practice of medicine, and in courses that address patient, physician, and society. Some have gone on to include CIM in their clinical skills training and add attentiveness to these dimensions and considerations to the assessment component as part of an objective structured clinical examination.

Experiential learning

Perhaps the most effective instructional strategy is to provide opportunities to experience CIM first-hand: either by offering integrative clinics as part of the student's ambulatory rotation in the community or by creating immersion experiences as electives. In both instances, students get to experience some of the therapies first-hand, and also observe the practice of integrative medicine and relationship-centred principles in action. For many students, this experience also provided an important opportunity to research the state of the evidence for many modalities and to engage in directed self-learning.



"Teaching students meditation, imagery, and tools for self-reflection as a way to reduce stress and build resilience has become increasingly prevalent."

Another way in which CIM has been incorporated into the preclinical curriculum has been through elective courses that emphasize mind-body skills to foster self-awareness and self-care. Teaching students meditation, imagery, and tools for self-reflection as a way to reduce stress and build resilience has become increasingly prevalent, with prominent medical schools, such as Monash University in Australia, Charité University in Germany, Utrecht in the Netherlands, and Georgetown University in Washington, DC, leading the way. Outcomes from these initiatives suggest that the programmes are effective in achieving multiple competencies, ranging from knowledge and skills to attitudes ([Lee et al., 2007](#); [Staffaroni et al., 2017](#)).

Clinical years

In addition to ensuring that all students achieve core competencies through required foundational content, the goal of teaching integrative medicine in the preclinical years is to provide skills training in clerkships, as well as advanced electives for students interested in pursuing a higher level of proficiency. One challenge of teaching integrative medicine, however, persists in the form of the disproportionate need to justify the inclusion of content, particularly where there is a pervasive sense that existing curricula are overly full.

Thus it is important to take a strategic and context-aware approach to the selection of material and teaching methods in the clinical years. Designing curricula for the clinical years of medical school requires the same systematic, evidenced-based approach to

content selection (e.g., reviewing and mapping a school's existing integrative medicine content, designing an 'ideal' curriculum, and then developing strategies to address the gaps between the existing and ideal forms). Over the last two decades of designing curricula, most medical schools have developed a set of strategies for maximizing the quality, integration, and impact of integrative medicine content.



"As medical students transition from the classroom to clerkships, however, they face the challenge of applying integrative medicine knowledge and skills to real patient encounters."

Clerkships

Clinical pearls toolkit

Increasingly, medical educators are acknowledging the imperative for tomorrow's physicians to be educated regarding CIM issues. This growing awareness is often expressed as the need for students to be able to interact appropriately with patients and advise them in a manner that contributes to high-quality, comprehensive care. As medical students transition from the classroom to clerkships, however, they face the challenge of applying integrative medicine knowledge and skills (often learned out of context) to real patient encounters.

One tool that has been developed at the University of California San Francisco (UCSF) to help students distil the key elements to review and reinforce on the wards is a collection of 'clinical pearls,' that is, an annotated collection of small bits of free standing, clinically relevant information (Saba et al., 2010). As part of a larger effort to design a social and behavioural sciences curriculum, faculty at UCSF worked with clerkship directors and medical students to review the preclinical integrative medicine content and identify key concepts that students would find most useful throughout all clerkships. These 'pearls' take the form of summaries (1–2 pages) to remind students of what to focus on in clinical encounters. (They also help further efforts at curriculum integration by informing clerkship directors, faculty preceptors, and house staff of the integrative medicine content students have been taught before the third year.) For example, one pearl is *"Communicating with Patients about Integrative Medicine: Suggestions for Talking with Patients about [complementary and alternative medicine] CAM."* The one-page summary includes definitions of key terms, questions and prompts for discussions with patients, and significant references. This curricular resource has proven extremely effective in aiding students' recall of important integrative medicine information and guiding their application of the content during their clerkship experience.



"With the evolution from the solo clinician to team-based care, it is important to include integrative medicine in the systematic interprofessional education that is necessary for true collaboration."

Interprofessional standardized patient examination

An increasingly recognized challenge for health professions students is moving from education in silos to adapting to a team environment. With the evolution from the solo clinician to team-based care, it is important to include integrative medicine in the systematic interprofessional education that is necessary for true collaboration: the curriculum must reflect the real-life experience of clinical teams, to prepare students for the diverse scenarios and dynamic environments they will encounter in practice.

The fields of integrative medicine and interprofessional education share many goals, including effective communication among practitioners, shared problem solving and decision-making, and integration of different knowledge structures into comprehensive action plans. The synergy between the two fields was foundational in designing an assessment to promote the common goals of team-based, community-focused, and patient-centred care. Effective interprofessional education engages participants in authentic tasks, settings and roles. Using these guiding principles, faculty at UCSF developed an Interprofessional Standardized Patient Exam (ISPE) that is required of all UCSF medical, dental, nurse practitioner, pharmacy, and physical therapy students (Rivera et al., 2018). In collaboration with a multidisciplinary team of educators, including colleagues from geriatrics and palliative care, an integrative medicine case was developed in which the patient presents to establish care and discuss therapeutic options for chronic low back pain and depressive symptoms, including acupuncture and mindfulness meditation. The learning objectives include effective communication regarding integrative medicine and respecting and negotiating the patient's preferences. This required ISPE not only assesses students' integrative medicine knowledge, skills, and attitudes, but, because of the 'capital' of the high-stakes examination, provides an opportunity to validate the importance of integrative medicine and endorse its role in interprofessional education.

Advanced electives

Despite the tremendous gains evident in some medical school curricula, the scope of required content in integrative medicine for many medical students remains limited. Students are frequently merely introduced to integrative medicine, without the necessary depth of exposure. Given the structural limitations of many medical school curricula, including insufficient time, the best form of advanced experience may be an elective in the later years.

Many medical schools have developed electives that permit a deeper exploration for students interested in advanced study. Typically, these 2- to 4-week blocks include a contextualizing overview of the historical and sociocultural context of integrative medicine, followed by didactic sessions (e.g., patterns of CAM use in the United States, TCM, Ayurveda, CIM for medically underserved populations), experiential sessions (Tai Chi, mindfulness meditation, guided imagery, acupuncture), joint sessions with interprofessional students (group discussions and activities with students from a local TCM college), and community preceptorships (shadowing local acupuncturists, naturopaths, chiropractors). This model of advanced exploration has been used successfully in the design of other long-standing integrative medicine electives and has proven ideal for providing greater breadth and depth of instruction in the field; offering real-world experiences in integrative, team-based care; and proposing practical options for pursuing additional clinical or research study in integrative medicine.



"Faculty and students can suggest integrative-medicine-themed solutions to

existing curricular challenges."

Although some of the difficulties faced by educators in teaching integrative medicine are unique, such as historical scepticism on the part of the biomedical field, many of the curricular challenges have already been faced by other medical school faculty endeavouring to incorporate content outside of the existing canon (e.g., the social and behavioural sciences). As is the case with other previously nontraditional topics, it is important to find ways to institutionalize integrative medicine content. It is always helpful to have a high-level champion within a school to promote integrative medicine education, but a great deal can also be accomplished through a deliberate, strategic approach to curricular integration.



"The sobering reality of the opiate crisis, in the US and beyond, has led to a sense of urgency by various academic medical organizations to explore and teach about non-pharmacological approaches to treating chronic pain."

As curricular reform and renewal takes place in many medical schools, there is opportunity to engage and collaborate with students, who are widely recognized as particularly effective curricular change agents. Specifically, while keeping the goals of the broader medical school curriculum in mind, faculty and students can suggest integrative-medicine-themed solutions to existing curricular challenges. For example, there are opportunities to apply cultural competence concepts through communication with standardized patients about CIM use. Another area is in the teaching of evidence-based medicine where the rigors and limitations of trial designs can be examined by reviewing recent acupuncture studies and trying to understand the impact of the clinical encounter and the power of placebo. The sobering reality of the opiate crisis, in the United States and beyond, has led to a sense of urgency by various academic medical organizations to explore and teach about nonpharmacologic approaches to treating chronic pain. This has led to a renewed examination of the body of evidence for various CIM therapies, such as acupuncture, massage, spinal manipulation and mind-body therapies, and their incorporation into clinical practice guidelines. Finally, with growing awareness of the imperative to address health and healthcare disparities, instruction in CIM can be dovetailed with the teaching of strategies to advance health equity, including practices, partnerships and policies ([Chao & Adler, 2018](#)).



"With growing awareness of the imperative to address health and healthcare disparities, instruction in CIM can be dovetailed with the teaching of strategies to advance health equity, including practices, partnerships, and policies."

Integrative medicine in graduate medical education

Residency

The first published set of curriculum goals and objectives for residency level training in complementary and integrative medicine was developed by the Society of Teachers of Family Medicine in 2000 (Kligler et al., 2000). Because of its explicit commitment to the biopsychosocial philosophy and to a whole person model of care, family medicine as a specialty was a natural fit for integrative medicine training. Although these were recommended rather than required guidelines, they helped set the stage for a rapid spread of curricular interventions in family medicine programmes around the United States. Most of these were offered as electives, but a number of programmes did begin at that point to require basic training in CIM as part of core family medicine training.

Those early curricular experiments, and a sense that a more uniform approach to delivering knowledge and skills in integrative medicine was needed, ultimately led to the development of the IMR programme in 2007 by the University of Arizona Center for Integrative Medicine (Lebensohn et al., 2012). The IMR programme is a 200-hour online curriculum designed to be imported into any primary care residency programme, supplemented with onsite activities led by a faculty mentor. The programme was originally piloted in eight family medicine programmes and is now being used in over 60 sites around the United States and Canada. The competencies outlined for the IMR project were deliberately keyed to existing Accreditation Council for Graduate Medical Education competencies as a strategy to facilitate widespread integration and acceptance of this curriculum by residency programme directors. The curriculum is modular and can be distributed through the course of residency in a variety of different ways depending on the needs and structure of a given residency programme.

The IMR programme has now expanded beyond family medicine residency and is being offered in a number of specialty training programmes including internal medicine, obstetrics and preventive medicine. A variation of the IMR curriculum aimed specifically at five paediatric integrative medicine in residency (PIMR) programmes was piloted starting in 2012, and now is being used at seven paediatric sites across the United States. Of the over 60 programmes currently offering the IMR, many do so as a track for residents specifically interested in integrative medicine, whereas others have it as a required curriculum element for the whole programme. Evaluation of the IMR programme has shown it to be effective in increasing knowledge of integrative medicine content and residents' confidence in their ability to effectively counsel patients in this area. There is also an explicit self-care component in the IMR curriculum to address issues of physician burnout and resilience.

The development of integrative medicine education at the graduate medical education (GME) level was significantly advanced through grants from the federal Health Resources and Systems Administration (HRSA). HRSA is an agency of the US Department of Health and Human Services, which over the past 6 years has funded

several significant projects to expand the scope of GME training in integrative medicine. The first of these was the integrative medicine in preventive medicine (IMPrime) programme, which supported the development of competencies in integrative medicine for preventive medicine as a specialty, as well as the development of curricular innovations to transmit those competencies (Jani et al., 2015). Following on this initiative, HRSA funded a number of preventive medicine residency programmes that are explicitly committed to including integrative medicine as a focus of their required curriculum.

In a bold move to take integrative medicine training beyond the boundaries of medical education and into the interprofessional arena, HRSA funded the National Center for Integrative Primary Healthcare (NCIPH), a national initiative in the United States aimed at developing uniform competencies and curriculum across the spectrum of health professions involved in primary care. This project—a collaboration between HRSA, the University of Arizona Center for Integrative Medicine, and the Academic Consortium for Integrative Health and Medicine—included in its scope not only the primary care medical specialties (family medicine, internal medicine, paediatrics and preventive medicine), but also nursing, pharmacy, behavioural health, chiropractic, acupuncture, naturopathy, public health, and dentistry. A consensus set of competencies for this project has been developed and published (Table 30.1).

Table 30.1 Competencies for integrative primary healthcare

| |
|---|
| <ol style="list-style-type: none"> 1. Practise patient-centred and relationship-based care. 2. Obtain a comprehensive health history that includes mind-body-spirit, nutrition, and the use of conventional, complementary and integrative therapies and disciplines. 3. Collaborate with individuals and families to develop a personalized plan of care to promote health and wellbeing which incorporates integrative approaches including lifestyle counseling and the use of mind-body strategies. 4. Demonstrate skills in utilizing the evidence as it pertains to integrative healthcare. 5. Demonstrate knowledge about the major conventional, complementary and integrative health professions. 6. Facilitate behaviour change in individuals, families and communities. 7. Work effectively as a member of an interprofessional team. 8. Engage in personal behaviours and self-care practices that promote optimal health and wellbeing. 9. Incorporate integrative healthcare into community settings and into the healthcare system at large. 10. Incorporate ethical standards of practice into all interactions with individuals, organizations and communities. |
|---|

From Kligler et al., 2015.



“Evaluation of the IMR programme has shown it to be effective in increasing knowledge of integrative medicine content and residents’ confidence in their ability to

effectively counsel patients in this area."

Subsequently, a 30-hour online core curriculum was developed to support these competencies titled 'Foundations in Integrative Health'. This course was piloted in 2016 to 2017 in a group of 982 trainees across multiple disciplines, including several medical specialties, nursing, pharmacy, public health, and several complementary health professions. Close to half of these trainees ($n=461/982$, 47%) completed the course, demonstrating pre-/postcourse improvements in integrative health knowledge and attitudes as well as self-care, wellness behaviours, and wellbeing (Brooks et al., 2019). The ultimate goal of this project was to create, test, and disseminate the set of educational resources needed to eventually support an experience in integrative healthcare as part of the required curriculum in every health profession participating in the primary care environment. These training resources remain available through the NCIPH ([NCIPH.org](https://www.nciph.org)) to support the development of effective teams ready to deliver integrative medicine in the primary care setting.



"The question of whether integrative medicine is primarily a subspecialty, requiring fellowship-level training programmes, or primarily an approach to the practice of medicine as a whole, which should be incorporated into training at all levels and for all specialties, has been hotly debated in the field."

The question of whether integrative medicine is primarily a subspecialty, requiring fellowship-level training programmes, or primarily an approach to the practice of medicine as a whole which should be incorporated into training at all levels and for all specialties, has been hotly debated in the field. The de facto outcome of this debate has been a two-pronged approach to training, including both the broad-based strategies described earlier and an evolving landscape of fellowship-level training programmes.

Fellowship

Fellowship-level training in integrative medicine dates to 1996 with the inception of the residential programme at University of Arizona. This was a 2-year residential fellowship with an emphasis on clinical training and leadership. This programme was later converted into a 2-year, 1000-hour distance-learning programme (which includes a total of 3 residential weeks). Over the past 10 years, over 1000 fellows have completed the fellowship, with almost every medical specialty represented. A set of core competencies for fellowship level training, developed by the Academic Consortium for Integrative Medicine and Health, was published in 2014 (Ring et al., 2014). These competencies have now been codified into use as part of integrative medicine board certification, offered by the American Board of Physician Specialties through the American Board of Integrative Medicine (ABOIM). The model of board certification follows the typical format, with eligibility contingent on matriculating at an accredited Integrative Medicine Fellowship. At present, 18 integrative medicine fellowships across

the United States are accredited; the models vary, with some offering integrative medicine education across medical specialties, and others in a specific specialty (e.g., integrative family medicine fellowships). The fellowships also vary in format, from entirely residential to hybrid forms with most content delivered online. Once matriculated, a medical provider is eligible to sit for the integrative medicine board examination.

Summary

The field of integrative medicine has emerged over the past 30 years, as the public sought therapeutic options for chronic conditions that were not being addressed adequately with conventional medical approaches. Researchers and clinical investigators followed with a renewed focus on studying the efficacy of nonpharmacologic approaches to management of pain, symptoms from cancer treatment, stress and other conditions. Given the high rate of patient use of CIM practices, physicians must be knowledgeable so they can advise their patients about the judicious use of these therapies to improve health and healing. Most medical schools and many residency programmes now include aspects of CIM in the undergraduate and graduate curriculum in ways that advance competencies in knowledge, skills, and attitudes. In addition, board certification in the field of integrative medicine represents a maturation of the field as a speciality. Moreover, integrative medicine in medical education can be synergized with other training elements, such as strategies to advance health equity to create a robust platform for development of skilled healthcare practitioners that can meet the public need.

References

- Brooks et al., 2019 Brooks AJ, Chen MK, Goldblatt E, et al. Introducing integrative primary health care to an interprofessional audience: feasibility and impact of an asynchronous online course. *Explore, the Journal of Science and Healing* 2019.
- Chao and Adler, 2018 Chao MT, Adler SR. Integrative medicine and the imperative for health justice. *The Journal of Alternative and Complementary Medicine*. 2018;24(2):101–103.
- Definition of Integrative Medicine, Academic Consortium for Integrative Medicine and Health, 2014 Definition of Integrative Medicine, Academic Consortium for Integrative Medicine and Health. (2014). Available at: <http://imconsortium.org/about/about-us.cfm> accessed 2015.
- Jani et al., 2015 Jani AA, Trask J, Ali A. Integrative medicine in preventive medicine education: competency and curriculum development for preventive medicine and other specialty residency programmes. *American Journal of Preventive Medicine*. 2015;49(5 Suppl 3):S222–229.
- Kligler et al., 2000 Kligler B, Gordon A, Stuart M, Sierpina V. Suggested curriculum guidelines on complementary and alternative medicine: recommendations of the Society of Teachers of Family Medicine Group on Alternative Medicine. *Family Medicine*. 2000;32(1):30–33.
- Kligler et al., 2004 Kligler B, Maizes V, Schachter S, et al. Core competencies in integrative medicine for medical school curricula: a proposal. *Academic Medicine*. 2004;79:521–531.
- Kligler et al., 2015 Kligler B, Brooks AJ, Maizes V, et al. Interprofessional competencies in integrative primary healthcare. *Global Adv Health Med*. 2015;4(5):33–39.
- Lebensohn et al., 2012 Lebensohn P, Kligler B, Dodds S, et al. Integrative medicine in residency education: developing competency through online curriculum training. *Journal of Graduate Medical Education*. 2012;4(1):76–82.
- Lee et al., 2007 Lee MY, Wimsatt L, Hedgecock J, et al. Integrating complementary and alternative medicine instruction into medical education: organizational and instructional strategies. *Academic Medicine*. 2007;82:939–945.
- Ring et al., 2014 Ring M, Brodsky M, Low Dog T, et al. Developing and implementing core competencies for integrative medicine

fellowships. *Academic Medicine*. 2014;89(3):421–428.

[Rivera et al., 2018](#) Rivera J, de Lisser R, Dhruva A, et al. Integrative health: an interprofessional standardized patient case for prelicensure learners. *MedEdPORTAL*. 2018;14:10715.

[Saba et al., 2010](#) Saba G, Satterfield J, Salazar R, et al. The SBS Toolbox: clinical pearls from the social and behavioral sciences. *MedEdPORTAL Publications*. 2010;6:7980.

[Staffaroni et al., 2017](#) Staffaroni A, Rush C, Graves K, Hendrix K, Haramati A, Harazduk N. Long-term follow-up of mind-body medicine practices among medical school graduates. *Medical Teacher*. 2017;39:1275–1283.

Clinical Reasoning

Ralph Pinnock and Steven Durning

Trends

- Clinical reasoning is dependent on the development of detailed content specific organized knowledge (content specific).
- It requires flexible use of multiple different strategies.
- To achieve expert performance requires prolonged and deliberate practice.
- Motivation and emotion affect clinical reasoning.
- Clinical reasoning is also context specific—the environment and other participants matter.

Key concepts

- Clinical reasoning: the cognitive process physicians use to analyse and synthesize information from history taking, physical examination and sometimes investigations to diagnose and treat the cause of a patient's presentation.
- Metacognitive monitoring: the mental process of reviewing one's experiences with the purpose of improving performance both on the task in hand and the future performance of similar tasks.
- Deliberate practice: in contrast to usual practice, this is purposeful, systematic, requires focused attention and is most effective when combined with feedback.
- Think aloud: the strategy of saying aloud what one is thinking when solving a problem.
- Context specificity: asserts that clinical reasoning is the product of multiple interactions between the physician, the patient and the environment that occur during an encounter.

Introduction

Clinical reasoning is the cognitive processes physicians use to analyse and synthesize information from history taking, physical examination and sometimes investigations to diagnose and treat the cause of a patient's presentation ([Eva, 2005](#)). It includes both diagnostic and therapeutic reasoning ([Trowbridge et al., 2015](#)). In the latter specific management is chosen based on the diagnosis and the patient's circumstances and preferences.

Teaching clinical reasoning in the workplace is a challenge. In the past clinical reasoning has been viewed as the exclusive domain of physicians. More recently, involving the patient and other professional healthcare staff in the diagnostic process have been proposed as ways to improve diagnostic accuracy. The role artificial intelligence has to play is still being debated. Currently, it has a role as a decision support tool but in the future, it is likely to also be used as an independent decision maker ([Buch et al., 2018](#)).

We will address the topic of teaching clinical reasoning by starting with the theories that inform its teaching. We then focus on five lessons from the literature. The lessons are not in order of importance. Each lesson includes a table to describe practical ways to teach some important aspects of clinical reasoning.

Theories underlying the teaching of clinical reasoning

A number of theories influence how we teach clinical reasoning. Dual process theory (fast and slow thinking) is perhaps the most common theory used in clinical reasoning. It argues that we use two general processes and describes these two specific complementary cognitive systems (processes) used in reasoning ([Sloman, 1996](#)). Nonanalytic reasoning refers to 'fast thinking' and is characterized as being fast, often subconscious and effortless. An example of fast thinking is recognizing the difference between a table and a chair. Although this seems intuitively obvious (we do not sit on tables), describing the difference to a colleague may be a little challenging as this recognition is subconscious. Nonanalytic reasoning strategies include pattern recognition and rules of thumb (heuristics). Analytic reasoning is slow and effortful, is used for complex presentations, and uses relevant information gathered about the patient's presentation, hypothesizing likely diagnoses and weighing the evidence to support or refute specific diagnoses. One uses analytic reasoning when trying to determine why a desk light is not working. In reality, both thinking processes (nonanalytic and analytic reasoning) are believed to be used simultaneously in diagnosing a patient's presentation. Analytic reasoning has been suggested as a technique that can be used to avoid the bias of premature closure (reaching a diagnosis before sufficient information is provided to do so) in nonanalytic reasoning by seeking other evidence to support the favoured diagnosis.

Script theory hypothesizes that knowledge of diseases and disorders is stored as illness scripts, which are mental representations of the signs and symptoms of specific diseases. As these scripts develop, they store detailed knowledge of diseases needed for diagnoses in a way that is readily accessible in memory (organized knowledge). Scripts are believed to form, in part, because of cognitive load theory. This refers to our limited human cognitive architecture, whereby we can only hold or process a limited number of information elements in our short-term or working memory, which is essential for learning and performance. With experience though, if information is grouped or chunked effectively, scripts develop that combine multiple aspects of diseases and disorders. Several of these scripts can then be used simultaneously in the limited capacity of the short-term working memory during reasoning. For experienced physicians these well-developed scripts reduce cognitive load and allow them to gather and analyse information simultaneously, 'thinking on their feet' ([Bowen, 2006](#)).

Metacognitive monitoring describes the mental process of reviewing one's experiences with the purpose of improving performance both on the task in hand and the future performance of similar tasks. When taking a history, it is useful to pause intermittently and check the accuracy of the data you have collected with the patient. These pauses are also useful opportunities to review what further data you need to make a diagnosis. There is some evidence that reflection during clinical reasoning improves diagnostic accuracy for complex presentations ([Mamede et al., 2012](#)).

Situated cognition theory highlights the importance of viewing clinical reasoning as more than a cognitive activity confined to the physician's mind but one that is heavily influenced by factors in the patient, the physician, and the environment (Durning & Artino, 2011). This theory may be useful when considering how different factors interact to contribute to learning and performance in clinical reasoning (Table 31.1).

Table 31.1 Contemporary theories that inform clinical reasoning

| Contemporary theories that inform the teaching of clinical reasoning | Implications for teaching |
|--|--|
| Dual process theory | Use 'think aloud' to model flexibility in using nonanalytic and analytic thinking during data collection. |
| Script theory | Encourage students to learn about diseases as they present in clinical practice. Practise comparing and contrasting different diseases with similar presentations. |
| Cognitive load theory | Use 'think aloud' to demonstrate how scripts can be used to compare and contrast diseases to help clarify a diagnosis. |
| Deliberate practice | It is purposeful and systematic. Students must be motivated, use preexisting knowledge, receive immediate formative feedback and practise repeatedly. Simulate decision making with virtual patients. Encourage peer group case presentations. |
| Situated cognition theory | Alert students to how the working environment, the patient and how they themselves all influence reasoning. |
| Metacognitive monitoring | Encourage students to monitor and analyse their thinking during data collection and as they formulate their diagnosis. |

Lesson 1. Teaching clinical reasoning must emphasize the development of detailed, content-specific, organized knowledge

One of the earliest features of clinical reasoning described is content specificity ([Elstein et al., 1978](#)). Clinical reasoning is not a generic problem-solving skill but is dependent on a large and broad knowledge base of diseases and disorders. Consequently, during their training, students need to assess a large number of different patients with the same diagnosis with a diverse range of presentations.

Knowledge organization refers to how information is believed to be intertwined (or interdigitated) in memory so that it can be rapidly and efficiently recalled and used in practice. Initially, networks are formed that explain the causes and consequences of disease in terms of pathophysiology. These networks are later encapsulated into a limited number of diagnostic labels, which contain the signs, and symptoms of diseases. With further knowledge organization and clinical experience on actual patients, these encapsulations develop into illness scripts (illness script theory) that are organized mental summaries of a particular disease. Organized knowledge allows for the development of effective illness scripts and can help reduce cognitive load. [Table 31.2](#) provides examples of how to promote the development of context specific organized knowledge ([Schmidt & Rikers, 2007](#))

Table 31.2 Promoting the development of detailed content-specific organized knowledge, illness scripts

| Knowledge | |
|---|---|
| A large and broad knowledge base | Learn pathophysiology and details of illnesses |
| Knowledge organization | |
| <ul style="list-style-type: none">– Strong mental representations of typical disease presentations– Interconnected and readily accessible knowledge base (illness scripts)– Multiple and varied clinical presentations of illness, including atypical presentations | <p>Structure the curriculum on clinical presentations rather than on the aetiology of diseases or organ systems to assist students to develop illness scripts (Pinnock & Jones, 2008).</p> <p>Clinical case discussions</p> <ul style="list-style-type: none">– Small-group activities or readings <p>Comparing/contrasting a wide range of diseases with typical and atypical presentations</p> <ul style="list-style-type: none">– Case-based learning (using whole case format or serial cue approach) (Pinnock et al., 2019a)– Work place-based learning—role-modelling by senior physicians using think aloud (Gee et al., 2017; Pinnock et al., 2016)– Virtual patients (Pinnock et al., 2012)– Simulated patients |

Illness scripts reduce cognitive load by ‘chunking’ together details of diseases. This makes it possible to use the relatively limited capacity of the short-term working

memory more efficiently. With well-developed illness scripts, physicians can collect and analyse data simultaneously (Bowen, 2006). This in turn enables physicians whilst taking a history to ask focussed questions relevant to possible diagnoses and also to compare and contrast possible diagnoses. In contrast, without developed illness scripts students early in their training are vulnerable to cognitive overload. This may be manifest as an being unable to remember which questions to ask during history taking or remember the patient's answers and formulate possible diagnoses simultaneously (Pinnock et al., 2019a).



"Final year student: I know much more about diseases now. If I compare myself to fourth-year (the first clinical year) to now (final clinical year) there is actually quite a big difference in terms of the questions you ask...you are you able to do it more smoothly and also be able to think of diagnosis while you're taking the history."

Pinnock et al. (2019b)

Lesson 2. Clinical reasoning requires multiple strategies and flexibility in strategy use



“Senior clinician: Think of a differential diagnosis right from the beginning and always tailor your history taking and physical examination to the patient’s problem.”

Pinnock et al. (2019a)

There are several reasons why clinical reasoning is a complex, cognitive process requiring multiple strategies and flexibility in their use. Both trivial and life-threatening diseases can present with similar signs and symptoms; distinguishing them can be challenging. Atypical presentations of diseases are not uncommon and often are at risk of misdiagnosis. Physicians have to think on their feet. During history taking and physical examination, information must be gathered to support a diagnosis, to refute other often-similar diagnoses and to inform further detailed questioning relevant to the specific diagnoses under consideration. Possible diagnoses need to be constantly reviewed in the light of further ongoing information collected from the patient, from investigations and the response to treatment. In addition, as with any decision process the physician is at risk of falling victim to cognitive biases, which are often unconscious (Croskerry, 2009).

Clinical reasoning strategies are the specific techniques that one may use when using nonanalytic or analytic reasoning. Nonanalytic reasoning strategies include pattern recognition and heuristics. Analytic reasoning strategies include ruling out the worst-case scenario, a key feature approach and a Bayesian approach.

There is increasing evidence to support the view that students require different methods of learning clinical reasoning at different stages of their training. The two common methods of teaching clinical reasoning are the ‘whole-case’ approach and the ‘serial-cue’ format. In the former, students are given all the information about the patient and then review this looking for evidence for a likely diagnosis. With the serial cue format which mimics clinical practice, students use information from their history taking to guide further questioning seeking specific features of possible diagnoses. Early in their training, before they have developed illness scripts the whole case method is more appropriate. Techniques that have been found to be helpful with this method are self-explanation in which students explain the reasons for their diagnosis and deliberate reflection where students compare alternative diagnoses and reflect upon evidence, which supports or refutes their diagnosis (Mamede et al., 2012). As students, develop their illness scripts, the serial cue method appropriate to use on clinical rotations (Pinnock et al., 2019a) (Table 31.3).

Table 31.3 Strategies used in clinical reasoning

| | |
|--|--|
| | |
|--|--|

| | |
|---|---|
| Analytic reasoning | <p>Hypothesize likely diagnoses.</p> <p>Consider the worst-case scenario. What diagnosis must not be missed?</p> <p>Do not ignore findings at variance with the favoured diagnosis.</p> <p>Are there any 'key features' that suggest a specific diagnosis?</p> <p>Compare and contrast possible diagnoses.</p> <p>Pause data gathering to summarize with the patient that the data collected so far is accurate. Check there is sufficient data to supporting the favoured diagnosis. What else could it be? Is it possible I am dealing with two diagnoses?</p> <p>If signs on physical examination are at variance with symptoms on history taking, further review the information gathered to consider diagnoses (Gee et al., 2017).</p> |
| Nonanalytic reasoning | <p>Pattern recognition and heuristics—rules of thumb (in intestinal obstruction the vomitus is usually bile-stained).</p> <p>Use cautiously. Always seek supporting data for favoured diagnosis to avoid premature closure.</p> |
| Be alert to situations, in the physician, the patient and the environment that are known to be associated with increased risk of errors | <p>Factors in the physician (fatigue, mood disorder, sleep deprivation), the patient (atypical presentation, stereotyping based on ethnicity, volatility) the environment (repeated interruptions, short appointment times).</p> |
| Promote metacognition (i.e., thinking about thinking) and use cognitive forcing strategies | <p>Encourage deliberate reflection—intentional pauses—during data gathering and reasoning to promote a heightened sense of vigilance, check for conflicting evidence and consider alternative diagnoses.</p> <p>Cognitive debiasing strategies:</p> <p>Decision support systems, e.g., Isabel (Graber & Mathew, 2008)</p> <p>Request a second opinion.</p> <p>How to identify situations (sleep deprivation, limited time to assess patients, distractions, e.g., having to attend to emergencies) that promote the use of heuristics and cause biases leading to decision errors</p> <p>(Chew et al., 2016; Mamede et al., 2012; Prakash et al., 2019)</p> |

Improving the quality of data collection during history taking and physical examination using analytic reasoning strategies have been proposed ([Gee et al., 2017](#)). Fewer strategies for nonanalytic reasoning have been proposed, however, the teacher should be aware that the learner will use fast thinking (nonanalytic reasoning) if prompted to do so or not ([Eva, 2005](#)).

Lesson 3. Clinical reasoning expert performance requires prolonged and deliberate practice



"Final year student: It takes a lot of experience to be good at clinical reasoning and the more you do it the better you get, so it takes many years."

Pinnock et al. (2019b)

In common with the development of expertise in other areas, learners need to engage in repeated deliberate practice to develop proficiency in clinical reasoning. Deliberate practice in contrast to usual practice is purposeful, systematic, requires focused attention and is most effective when combined with feedback ([Ericsson, 2004](#)). It is initially practised under the guidance of a coach or mentor and involves effortful focus on the component parts of the activity (e.g., forehand in tennis or cardiac auscultation in medicine) ([Table 31.4](#)).

Table 31.4 Strategies for practising clinical reasoning

Assess patients under supervision with feedback (direct observation).

Longitudinal mentoring.

Think aloud - to show flexibility in thinking and reflection.

Peer teaching.

Promoting progressive independence of learner (when ready).

Cognitive forcing strategies eg checklists

Ask 'what if' questions.

Emphasize big picture concepts, common vs atypical presentations of diseases and disorders.

Use **IDEA**: Interpretative summary, differential diagnosis, explain reasons for favoured diagnosis, alternative diagnoses with reasons ([Baker et al., 2015](#))

On clinical rotations, students assess patients under supervision initially under direct observation of a supervisor and then later independently followed by reporting of their findings and possible diagnoses to their supervisor. Think aloud can be very useful to explore how the student is thinking. This is particularly important for the students who may be struggling with clinical reasoning. Just as physicians diagnose their patient's ailments, they should also be able to diagnose the nature their students' difficulties ([Audétat et al., 2017](#)).

As their clinical reasoning abilities develop, students may benefit from practising some of the skills of self-regulated learning. Learning to set objectives, choosing which strategies to use to achieve these, monitoring their performance and reflecting on their

performance during and after the completion of their objective. Reflection during and after clinical assessments are associated with increased diagnostic accuracy ([Prakash et al., 2019](#)).

Students learn clinical reasoning in the workplace on ward rounds and in clinics with supervision by seniors. Small group teaching with peers may also be effective.

Lesson 4. Motivation and emotion impact on clinical reasoning

The students' motivation and emotions influence how they perceive, interpret and act on information ([McConnell & Eva, 2012](#)).

Motivation is the complex interaction between competing internal and external factors ([Sobral, 2004](#)). Intrinsic motivation is self-determined, whereas extrinsic motivation occurs because of pressure from others. It is generally assumed that medical students are motivated to learn and perhaps this is even more so for clinical reasoning because of its perceived importance ([Pinnock et al., 2019b](#)). The learning environment has a major influence on motivation and can be modified to enhance learning ([Sobral, 2004](#)). Self-determination theory describes how internal motivation drives human behaviour. To enhance internal motivation, three basic needs must be met. They are competence (facilitated by practice with feedback, freedom from demeaning evaluations), autonomy (having choice and opportunity for self-direction) and relatedness (a sense of belonging to others) ([Brissette & Howes, 2010](#)). Teachers can promote learning clinical reasoning by ensuring these needs are acknowledged and met in the workplace ([Box 31.1](#)).

Box 31.1

Enhancing motivation for learning clinical reasoning

- Optimizing the learning environment
- Encouraging progressive learner autonomy/independence
- Avoiding sleep deprivation and burnout
- Providing positive feedback and encouragement
- Avoiding demeaning comments and behaviours
- Promote self-direction with explicit goals.
- Make students feel part of the clinical team
- Encourage students to members of the clinical team
- Provide learning opportunities appropriate to level of training

Lesson 5. Clinical reasoning is context-specific



"Final year student: Every patient is different, every situation is different even if its something simple that you have seen many times before, the management of the condition might be completely different in that patient."

Pinnock et al. (2019b)

As already discussed, clinical reasoning is not a generic skill, rather it is content specific and heavily dependent on a large body of well-organized knowledge. Although content specificity has been recognized for some time, it is only more recently that clinical reasoning has also been recognized as being context specific (Durning & Artino, 2011; Elstein et al., 1978). It is also profoundly influenced by all aspects of the changing environment, variations in the patients not only in terms of their presentations but also in how they communicate. Countertransference, the sometimes-negative emotions experienced by the practitioner in response to a particular patient, has long been recognized in psychiatry, other areas of medicine have been slower to acknowledge its influence on patient assessment and outcomes. Our negative biases that may negatively affect our patients need to be acknowledged and discussed openly. Finally, as with any other skill practice accompanied by supervision will improve performance. During training virtual patients which simulate clinical reasoning can complement the learning in the workplace (Pinnock et al., 2012). The current interest in reducing burnout and improving physicians' quality of life is also likely to have beneficial effects on their clinical reasoning proficiency by facilitating more focussed attention during their consultations. No longer can we view clinical reasoning as an insulated cognitive process in the physician's mind, but more accurately as a cognitive process strongly influence by factors in the patient, the environment and physicians themselves.

Students usually start practising clinical reasoning in small groups with simulated patients in a classroom. This is very different from how they will practise in future, where diagnoses have to be formulated in a busy often-noisy atmosphere with its susceptibility to biases and containing a multitude of environmental factors that can potentially adversely influence clinical reasoning.

Summary

As students learn clinical reasoning, they become aware of the theories and practices we have discussed. They often start learning common diseases and disorders based on organ systems. This is unlikely to support the development of scripts that are established on the signs and symptom of clinical presentations. As their scripts develop, they are able to manage the cognitive load of information they gather to ask focussed questions during history taking and start to analyse the data as they are collecting it. Dual process theory becomes incorporated in their reasoning processes and with deliberate practice, they gradually become more proficient and flexible in their reasoning. Metacognitive monitoring should become an integral part of their reasoning process, so that they always consider a range of diagnoses and remain alert to cognitive biases. The implications of one important phenomenon that is difficult to learn outside the clinical environment is context specificity ([Durning & Artino, 2011](#)). This refers to the variation in a participant's performance from one case or situation to the next. It is only in the clinical environment that students can learn to become aware of and manage all that influences their reasoning ([Table 31.5](#)).

Table 31.5 Modify the learning environment to promote the development of clinical reasoning

| | |
|---|--|
| Teachers: expert clinicians with an understanding of educational principles | Staff development for clinicians to develop as teachers Physicians have assigned time to teach Physicians are role models using 'think aloud' |
| Patient factors | Be aware of stereotyping What patients do you find difficult to assess? For example, parasuicides Make sure you are addressing the patient's concerns |
| Environmental factors | Adequate appointment length Allocate time for teaching on ward rounds and in clinics Include allied health staff in diagnostic formulation |
| Diagnostic support systems | Seek second opinions Encourage diagnostic support tools, for example, Isabel |
| Students | Adequate sleep Time-out from study Facilities to manage student stress |

References

- [Audétat et al., 2017](#) Audétat MC, Laurin S, Dory V, Charlin B, Nendaz MR. Diagnosis and management of clinical reasoning difficulties: Part II Clinical reasoning difficulties: management and remediation strategies. *Medical Teacher*. 2017;39(8):797–807.
- [Baker et al., 2015](#) Baker EA, Ledford CH, Fogg L, et al. The IDEA Assessment Tool: Assessing the Reporting, Diagnostic Reasoning, and Decision-Making Skills Demonstrated in Medical Students' Hospital Admission Notes. *Teaching and Learning in Medicine*. 2015;27:163–173.
- Bowen, 2006 Bowen J. Educational strategies to promote clinical diagnostic reasoning. *New England Journal of Medicine*. 2006;355:2217–2225.
- [Brissette and Howes, 2010](#) Brissette A, Howes D. Motivation in medicine: a systematic review. *Webmed Central Medical Education*. 2010;1 WMC001261.
- [Buch et al., 2018](#) Buch VH, Ahmed I, Maruthappu M. Artificial intelligence in medicine: current trends and future possibilities. *British Journal of General Practice*. 2018;68(668):143–144.
- [Chew et al., 2016](#) Chew KS, Durning SJ, van Merriënboer J. Teaching metacognition in clinical decision-making using a novel mnemonic checklist: an exploratory study. *Singapore Medical Journal*. 2016;57(12):694–700.
- [Croskerry, 2009](#) Croskerry P. A universal model of diagnostic reasoning. *Academic Medicine*. 2009;84(8):1022–1028.
- Durning and Artino, 2011 Durning SJ, Artino A. Situativity theory: a perspective on how participants and the environment can interact: AMEE Guide no 52. *Medical Teacher*. 2011;33(3):188–199.
- Elstein et al., 1978 Elstein AS, Shulman LS, Spaka SA. *Medical problem solving: an analysis of clinical reasoning* Cambridge (MA): Harvard University Press; 1978.
- [Ericsson, 2004](#) Ericsson KA. Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains. *Academic Medicine*. 2004;79(10 Suppl.):S70–81.
- Eva, 2005 Eva K. What every teacher needs to know about clinical reasoning. *Medical Education*. 2005;39(1):98–106.
- Gee et al., 2017 Gee W, Anakin M, Pinnock R. Using theory to interpret how senior clinicians define, learn, and teach clinical reasoning.

- MedEdPublish*. 2017;6(4):13.
- [Graber and Mathew, 2008](#) Graber ML, Mathew A. Performance of a web-based clinical diagnosis support system for internists. *Journal of Internal Medicine*. 2008;23(1):37–40.
- Mamede et al., 2012 Mamede S, van Gog T, Moura AS, et al. Reflection as a strategy to foster medical students' acquisition of diagnostic competence. *Medical Education*. 2012;46(5):464–472.
- [McConnell and Eva, 2012](#) McConnell M, Eva K. The role of emotion in the learning and transfer of clinical skills and knowledge. *Academic Medicine*. 2012;87(10):1316–1322.
- Pinnock et al., 2019a Pinnock R, Anakin M, Lawrence J, Chignell H, Wilkinson T. Identifying developmental features in students' clinical reasoning to inform teaching. *Medical Teacher*. 2019a;41(3):297–302.
- Pinnock et al., 2019b Pinnock R, Anakin M, Jouart M. Clinical reasoning as a threshold skill. *Medical Teacher*. 2019b;41(6):683–689.
- [Pinnock et al., 2016](#) Pinnock R, Fisher TI, Astley J. Learning and assessing clinical reasoning in everyday clinical practice. *Medical Education*. 2016;50:564–591.
- [Pinnock and Jones, 2008](#) Pinnock R, Jones A. An undergraduate paediatric curriculum based on clinical presentations and 'key features'. *Journal of Paediatric Child Health*. 2008;44(11):661–664.
- Pinnock et al., 2012 Pinnock R, Spence F, Chung A, Booth R. evPaeds: virtual patients to assist undergraduates to develop clinical reasoning. *Clinical Teacher*. 2012;9:152–157.
- Prakash et al., 2019 Prakash S, Sladek RM, Schuwirth L. Interventions to improve diagnostic decision making: a systematic review and meta-analysis on reflective strategies. *Medical Teacher*. 2019;41(5):1–8.
- [Schmidt and Rikers, 2007](#) Schmidt HG, Rikers RM. How expertise develops in medicine: knowledge encapsulation and illness script formation. *Medical Education*. 2007;41(12):1133–1139.
- [Sloman, 1996](#) Sloman S. The empirical case for two systems of reasoning. *Psychology Bulletin*. 1996;119(1):3–22.
- Sobral, 2004 Sobral D. What kind of motivation drives medical students learning quests?. *Medical Education*. 2004;38:950–957.
- [Trowbridge et al., 2015](#) Trowbridge RL, Rencic JJ, Durning SJ. *Teaching clinical reasoning ACP Teaching Medicine Series* Philadelphia (PA): Versa Press; 2015.

Medical Education in an Era of Ubiquitous Information

Johmarx Patton and Chuck P Friedman

Trends

- Information is available more and more in digital form.
- Biomedical knowledge via the Internet is making point of care reference easier.
- Learning health systems are enabling healthcare to continuously improve, reducing quality improvement latency by years.
- Because new evidence is being generated in real time, clinicians need to be able to deal with uncertainty of evidence when making decisions.
- Comfort with clinical reasoning and decision aids must continue to increase.

Key concepts

- Digital learner: regardless of generation, digital native or digital immigrant, learners will use digital methods for information acquisition and knowledge supplementation that teachers need to be prepared for.
- Computable biomedical knowledge: in addition to human readable knowledge pertaining to health and healthcare, knowledge representations that can be consumed, interpreted and displayed by machines aid in knowledge acquisition and decision making by skilled users.
- Application Programming Interface (API): a computing interface that defines interaction between multiple software intermediaries.

Introduction

In the modern world, health information is everywhere. Increasingly, this information is in digital form, which makes it accessible not only to people but also to devices that can store it and add value to it through computation. Information is available to everyone who participates or has an interest in health and healthcare, including health professionals and their patients, organizations that pay for healthcare, educators, as well as researchers and quality improvement specialists.

Perhaps the greatest change in recent years is the availability of health-related information to the general public, including both their personal health data and general medical knowledge. Patients as recipients of healthcare have access to data about them generated by healthcare, and, increasingly, they are capturing their own data through sensors and mobile devices.

Information is a resource that can lead to better health and healthcare, but this does not happen automatically. All participants in healthcare must learn to be careful generators, skilled navigators and discriminating users of information. They must approach information with a healthy scepticism about its accuracy. They must know how to filter information to avoid what has been called 'drinking from a fire hose' (Friedman et al., 2016).

Data, information, and knowledge

Understanding the distinction between data, information and knowledge allows us to develop different strategies to teach learners to interact in the digital healthcare environment. 'Information' is typically used as an umbrella term for the continuum of data to knowledge, and we follow suit in this chapter. Anchoring the continuum on the data side are the strings of symbols that we are familiar with as raw data. Anchoring the continuum on the knowledge side are rules and hypotheses that help us analyse complex situations. In our current environment, it has all become ubiquitous as it is increasingly stored in a digital format.



"Perhaps more than any other recent advance, health information technology (HIT) is rapidly becoming a key foundation for all aspects of patient care. As the complexity of healthcare increases, so does the complexity of collaboration needed between different members of the healthcare team. To evaluate the effectiveness of new treatments and the quality of care in specific populations, individual providers or the team as a whole must be able to rapidly and efficiently collect, analyse, and select intervention and performance data. Regardless of their chosen field, all medical students will have to manage vastly increased amounts of biomedical and clinical data."

Triola et al. (2010)

When knowledge is in a computable form, it can also advise us as to what course of action to take. Knowledge has existed for decades in the form of journal articles and other tomes. Although available, it is not easily accessed and its ability to give on-demand advice is nonexistent. In the last decade, we have seen digital knowledge being leveraged in the form of risk prediction calculators and computable clinical guidelines. The ability to access this knowledge in the moment is a competency that will increasingly be necessary for clinicians.

The ability to access the right information, about the right patient, at the right time to deliver quality and effective care is a benefit that electronic health records (EHRs) give to healthcare providers across the globe. The generation of data by the patients themselves, in addition to all of the data generated by the healthcare system, and the continued explosion of medical knowledge at exponential rates has created a dynamic, fluctuating information environment in healthcare. As clinicians, the ability to recognize what medical knowledge needs to be intrinsic to one's self, what knowledge can be obtained when needed and where to obtain that knowledge becomes another waypoint that must be navigated. The partnership between people and technology is continuing to develop and can fulfill this need. As educators, we must ensure that our learners are able to maximize the partnership between themselves and digital information resources.

Healthcare in the digital age (and biomedical knowledge in the cloud)

In the digital world, information can easily be moved from where it is to where it is needed. The current healthcare environment is evolving to supply data and information from EHRs, emerging knowledge from the learning health system, and biomedical knowledge repositories in the cloud. As these technologies take a foothold, they have effects on medical education, and we will explain the impact of each of these in turn. Increasingly, in this digital environment, and with the explosion of biomedical knowledge, information technology will be required in addition to the decision-making done in clinical practice. This will require a shift on the part of the profession to recognize that best practice will begin to increasingly rely on aids to clinical reasoning and decision making, such as clinical decision support systems.

Electronic health records

A multitude of global sources predict that the movement of healthcare documentation from analogue to digital will continue to evolve, and at a rapid pace. EHRs have been abundant in the United Kingdom since the 1990s, and the continued adoption of digital documentation for acute care continues. Northern European nations, such as Denmark and the Netherlands, have converted to nearly digital systems. A nationwide implementation of the open source VistA EHR occurred in Jordan in 2009. In developing nations, such as Malawi, that are still implementing critical infrastructure, efforts to implement EHRs at the point of care have created networks of healthcare information that improve the quality of care for patients. This continued evolution from paper records to digital ones has several benefits, including increased access for authorized individuals and the ability to perform analyses with greater ease.

In addition to providers who benefit from increased access to their patients' digital information, there are two additional beneficiaries—other providers on a national or international infrastructure, and the health system itself. As the exchange of health information from one location to another becomes more seamless, having a fuller picture of a patient available to them, physicians on the other side of a country or on the other side of the world are able to provide the best possible care to a patient with increased precision.

Learning health systems

This same information is available to the health system at large, allowing it to study and improve itself. The concept of the 'learning health system' is continuing to grow in the United States and in Europe. This infrastructure affords simultaneous virtuous learning cycles on a variety of specific health problems. A learning cycle consists of three key phases: (1) the aggregation and analysis of data; (2) the creation of knowledge and its application to change clinical practice; and (3) recording the results of the application

and continuous improvement thereafter. The learning health system has a large number of uses, from public health tracking and managing epidemics to the surveillance of drugs newly released to market, to the discovery of new best practices for the treatment of common diseases such as asthma.



"A more efficient, effective, and safe healthcare system requires a more rapid progression of knowledge from the lab bench to the bedside."

Friedman et al. (2010)

Biomedical knowledge in the cloud

As this new knowledge is generated, it is often digitally available before it reaches print, if it ever reaches physical print at all. As both biomedical information (general information about the human body and health) and knowledge (in the form of checklists, best practice guidelines, models and algorithms) become available on the internet, it can be represented in both human readable and computable forms. Both formats will give rise to the 'knowledge cloud', available anytime and anywhere with a connection to the internet. Over the coming decade, the ability to pose biomedical questions to the knowledge cloud, or for the cloud to offer clinical decision support based on the best available evidence will emerge as the best clinical practice.

Aids to clinical reasoning and decision making

Even in the present day, clinical decision support from local systems serves as an aid for the brain capacity of physicians. This, however, is not a new concept. Handbooks are a common item found in the laboratory coats of physicians across the world. The amount of information that one is required to remember to deliver immediate care versus what can be referenced has long since been recognized. The dilemma we face at the present day, and will continue to face in the future, is that the volume of information that we will have to store external to our own brains will continue to increase. The medical profession will need to be ever more comfortable with relying on external sources to provide it with the information needed to deliver effective and safe care to patients. As educators, it is equally important that we are comfortable with this mode of patient care. We must recognize our own biases and current practices. This will aid us in helping our learners develop their own practices based on their innate abilities; understanding what they need to know and what they need to know how to retrieve. This changes the lens with which we examine our learners' performance and the expectations we have for them and that they have for themselves.



"It must be acknowledged, first, that the development of health information technology will require (or enable) cognitively-based physicians to delegate many tasks that

they previously held closely."

Blumenthal (2010)

The digital native learner

Many educators will assume that because our younger learners have grown up with Google and smartphones that they will instantly have proficiency with the digital tools that we supply to them. This is far from true and is a pitfall that many of our colleagues fall into when approaching the so-called digital native learner.

Research has yet to show that the generation that has grown up with digital tools is at large competent with those tools or that those competencies transfer to the academic environment ([Gallardo-Echenique et al., 2015](#)). Because these learners are not as competent as you may anticipate, it is important to at first ensure the baseline competencies necessary to engage with digital healthcare environment.

It is probably best to begin with understanding how comfortable your learners are with technology. From an experience of teaching a classroom of younger learners in the same age range, chapter author Patton found the learners' facility with the tools provided to them to be widely variable. Although a few of the learners could easily access a virtual private network and log on to the simulated EHR, other learners had difficulty just logging in to the computer itself. This was Patton's first indication that a section on this topic would be necessary. Before this, he had been quite presumptuous in the learners' collective ability to successfully navigate commonplace technology.

We recommend that, as a baseline, learners will need to be competent in computer and mobile hardware; have facility with accessing the Internet and other digital resources; and be capable of rudimentary searches. Developing the basic information retrieval competencies of our learners may not be so easy. [Thompson \(2013\)](#) found that although learners are facile with rapid communication technologies like text messaging, their ability to perform deep, meaningful searches was lacking. The first step then would be to build up the learners' ability to create search terms that will be appropriate to yield valuable information. This will be covered later in the chapter.

The generational differences that we assume between the 'digital native' learners and the 'digital immigrant' faculty are an artificial boundary created by our assumptions of the environment that our learners born after 1980 have grown up in, and reinforced by, the popular media ([Gallardo-Echenique et al., 2015](#)). As educators, we should instead focus on 'digital learners', regardless of the generation they belong to. This allows us to engage with physician learners across the spectrum of their career, and focus on what a digital learner needs at baseline to be successful in acquiring the competencies we will outline in the second half of this chapter.

Three key competencies at a time of ubiquitous information and educational strategies to support the digital learner

A medical education curriculum at a time of ubiquitous information requires changes or additions to current educational goals and strategies. We introduce three key competencies for physician learners, along with the accompanying strategies for curriculum design, delivery and assessment. These are our suggestions to effectively prepare physicians for the information-based future of clinical practice in 2020 and beyond.

Metacognition and sensing gaps in one's knowledge

In the age of ubiquitous information, it may be more important for a physician to know whether their approach to and knowledge about a clinical situation are correct or incorrect rather than it actually be correct. If their assessment of the situation is flawed, and the physician is able to recognize that it is flawed, their ability to access and interpret knowledge from sources external to themselves proves invaluable and they are able to course correct. Physicians who believe that they are correct will not routinely consult available resources. Their unaided actions could presumably put patients' health and wellbeing at risk. The first competency that we are recommending is that the competent physician must be aware of what they do and do not know, and have some insight into how they process information; they must know when to ask for help when making clinical decisions in real time because they have reached the limit of their knowledge about the situation. Collectively, these skills and attitudes fall into the realm of metacognition.

Metacognition

Metacognitive skills are the hallmark of a learner that will be capable of lifelong learning. Mark [Quirk \(2006\)](#) describes the five key metacognitive skills of the physician learner to be: (1) definition and prioritization of goals, (2) anticipation and assessment of their specific needs in relation to the goals, (3) organization of their experiences to meet their personal needs, (4) definition of their own and recognition of differences in others' perspectives, and (5) continuous monitoring of their knowledge and problem solving. The fifth skill, continuous monitoring of one's knowledge, plays a critical role in the day to day of clinical practice. Not discounting the other skills, which are necessary for professional development over one's lifetime, helping learners develop the ability to appraise their knowledge level in the moment could potentially prove to be lifesaving. By providing an environment that allows learners to acquire and utilize these skills, we allow these future physicians to develop the confidence that they will need to act decisively in difficult situations.

Confidence calibration

Described by [Friedman et al. \(2016\)](#), the Confidence Calibration Matrix ([Fig. 32.1](#)) displays what happens when a clinician is correct or incorrect when their appraisal about their knowledge is correct or incorrect. The physician is typically safe when they are properly calibrated and appropriately access information. There is the possibility, however, that suboptimal use of information resources results in the clinical assessment switching from correct to incorrect. Using the strategies outlined later we can guard against this.

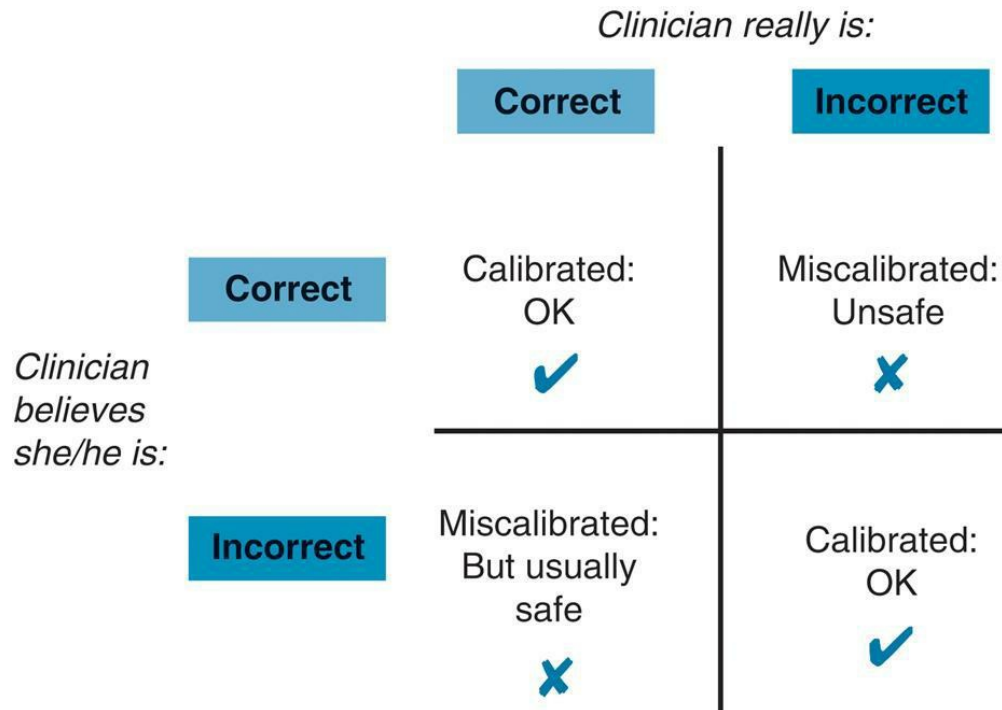


FIG. 32.1 The Confidence Calibration Matrix. (From Friedman et al., 2016.)

The first type of miscalibration occurs when a physician is correct but believes that they are incorrect. Although typically safe, this form of miscalibration results in slower clinical decision making, which could be hazardous in some clinical situations. The second type of miscalibration occurs when the physician is incorrect but believes that they are correct. This is the most dangerous situation because the physician will not seek assistance from the appropriate information resources. Even when decision support tools sense a problem, this physician will likely ignore the advice.

It is difficult to guard against this second type of miscalibration. Individuals in this state will not seek help, and others will only recognize their deficiency once a medical error is made. Preventing learners and physicians from entering this state by reinforcing the following point is the best cure for this ailment.

The salient identification for medical teachers is the learner that is incorrect and recognizes that they are incorrect. This requires a change in culture where not knowing the answer but recognizing one's knowledge gap and knowing how to bridge the gap in one's own knowledge is equal to or greater than having the right answer. The learners that meet this competency will be able to understand their own thought process and knowledge; access and retrieve available resources; and use those resources to make corrections to their thoughts and actions.

Demonstration and assessment of metacognition

A strategy to have learners demonstrate this behaviour could be used during rounds when learners are presenting on patients, or similarly in small groups discussing scientific principles. Preceptors should routinely ask the learners about their level of

confidence in the assessment they have made and what evidence brought them to that conclusion. This promotes the behaviour of consciously considering one's confidence level. With habituation this will be a routine inner dialogue for the learner—to evaluate their confidence about the assessment of a clinical situation.

To reinforce this approach, practicing physicians should model these same types of behaviours. As medical educators we will need to become more introspective about, aware of, and willing to discuss our own confidence and levels of calibration.



Tip

The value of reflection continues to be questioned by learners. Be certain to help them understand the value of such activities to create buy-in and allow them to do meaningful work.

Reflection of this type is a good way to assess this metacognition competency. Through carefully designed guided reflections, learners will be able to self-monitor and receive feedback from others ([Sandars, 2009](#)). Assessment of the reflection should include comments on the depth of reflection, examination of one's own perspective, and inclusion of the perspective of others.

Information retrieval and the ability to form an appropriate question

Whereas the first competency addresses the ability to recognize gaps in one's knowledge, the second competency ensures that the skills are in place for the learner to frame a good question and access available resources to improve their incomplete knowledge. However, to know where to look, there must be some basic understanding of the subject at hand.

To illustrate the point, consider three potential states of being for the learner or physician before interacting with digital resources ([Fig. 32.2](#)). In the first state, the individual has insufficient knowledge about the problem of interest to frame an appropriate question. The learner in this state will not be able to obtain assistance from any resources and will be unable to address their current situation. In the second state, the learner has partial knowledge about the problem of interest and will be able to frame a good question. In the third state, the learner's personal knowledge is already complete. In this final state consultation with information resources is not needed; however, as the volume of biomedical knowledge continues to explode, learners are unlikely to reach this state by the end of their careers.

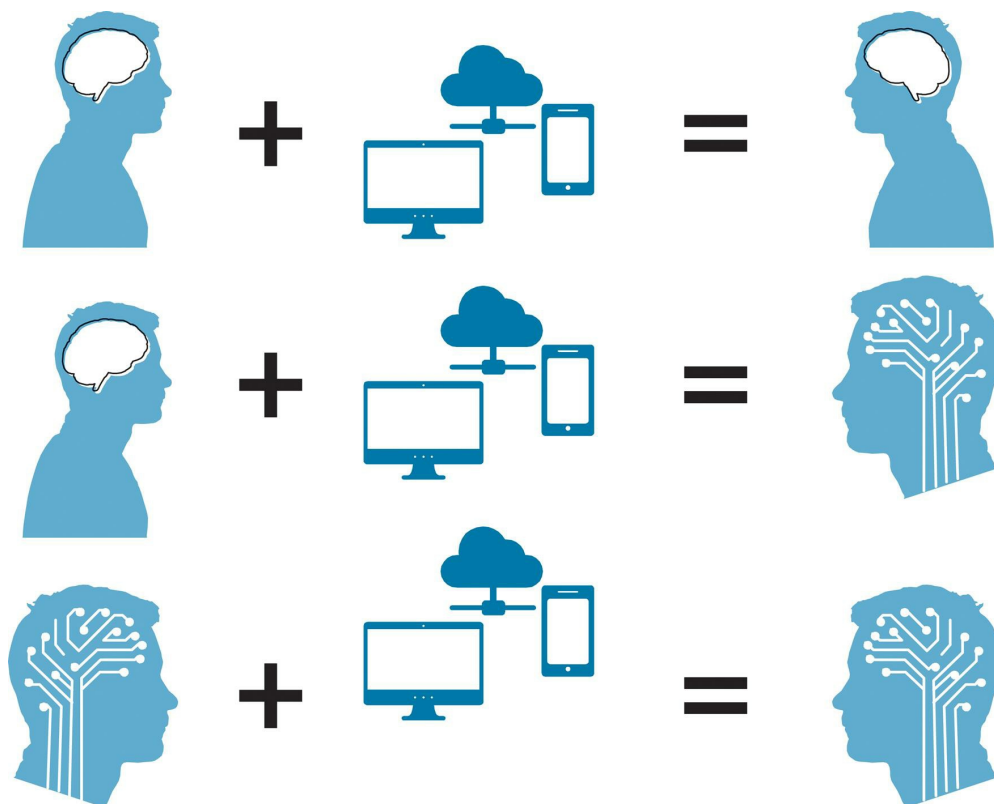


FIG. 32.2 Effects of ubiquitous information on different states of knowledge. *Top:* With insufficient knowledge, the person cannot frame a question and does not increase their

knowledge. *Middle*: With partial knowledge, the person can pose questions to the available resources and increase their knowledge. *Bottom*: With (nearly) perfect knowledge additional information is not needed. (Modified from Brain by Wes Breazell from the Noun Project; Cloud Server by Creative Stall from the Noun Project; Computer Icon by Creative Stall from the Noun Project; Mobile Phone by Cengiz SARI from the Noun Project.)

Foundational, advanced and specialized medical knowledge

Delivering this competency to learners requires a shift in focus from providing every possible piece of knowledge to learners before they exit our doors to one of learning what they need to know to frame an appropriate question. This educational approach places an emphasis on the organization of knowledge in curricula to adequately describe what is truly foundational knowledge for learners, compared with what would be advanced knowledge or even specialized knowledge. This is a departure from teaching a large volume of knowledge and a shift to teaching foundational knowledge that serves as a scaffold to prepare learners for advanced, and subsequently specialized, medical knowledge.



Tip

Curriculum inventory software, including several free to use packages, simplifies the task of compiling curriculum data. Sharing, making visualizations, and deriving meaning from the data become easier.

Cataloguing the existing curriculum is the first step in reorganizing it to effectively deliver the right knowledge to the learner at the right time. Many schools are beginning to inventory what they teach and where, documenting learning objectives for each session that they give to their learners (Dexter et al., 2012). To fully realize the potential of what has been collected, tagging content according to its level of abstraction from facts to high-level principles will help filter what must be taught from what can be sought by the learner. Once this inventory is available it becomes relatively easier to restructure the curriculum to deliver foundational scaffolding knowledge to early students, advanced knowledge to your more senior medical students, and supply specialized knowledge to those who will need it in their practice.

Framing an appropriate clinical question

Informationists and librarians play a key role in educating physician learners about framing an appropriate clinical question. Once an appropriate search has been devised, assessing which sources of information can best answer that question can be guided by the librarian. Librarians use heuristics like reputation of source, methodology of creation and date of publication to help them make recommendations. Learners and

medical teachers can also use these heuristics to evaluate sources of information.

Physician learners will require practice in formulating good questions to prepare them for the digital information supported practice of the future. To accomplish this, information retrieval sessions could use currently available versions of cloud knowledge resources that are mature enough to provide valid advice—even if these tools are not yet mature enough to be deployed in clinical practice. In doing this, we can take advantage of the fact that simulated clinical problems posed in the classroom mirror future practice. Even though this technology is still being developed, it can be used in these situations to help learners develop skills they will need in a future when that technology is more mature and widely deployed. In general, the curriculum should challenge learners with problems that require use of the digital information resources, whatever the state of those resources might be at that point in time.

Assessment of information retrieval and analysis

To assess the ability to frame an appropriate question and retrieve the appropriate information, examinations should allow learners to demonstrate this competency via ‘open book’ exams. This shift from ‘closed book’ exams aligns with the shift from learning a large fund of knowledge to knowing what you need to know to learn more. Given the ubiquitous nature of information in the digital age of healthcare, there is little justification to continue the custom of ‘closed book’ exams at the level we currently practice.

Enacting this assessment strategy can be accomplished using a modification of the triple jump exercise introduced at McMaster University ([Smith, 1993](#)) ([Fig. 32.3](#)). The first pass is a closed book examination based on the learner's personal knowledge only. This first pass provides a ‘scaffold score’, which assesses their foundational knowledge. In the second pass, the learner can access information resources to provide a refined answer to the problem at hand. This second exercise provides two scores: a ‘process score’ related to how well they were able to use the available information resources and an ‘examination score’ of how well the learner was able to perform assisted by the information in their environment. In the final jump of the assessment, the learner presents their findings from the second exercise to an assessor that can interrogate the learner's knowledge and process in the moment. The final jump verifies the learner's ability to access knowledge and understand their thought process in real time.

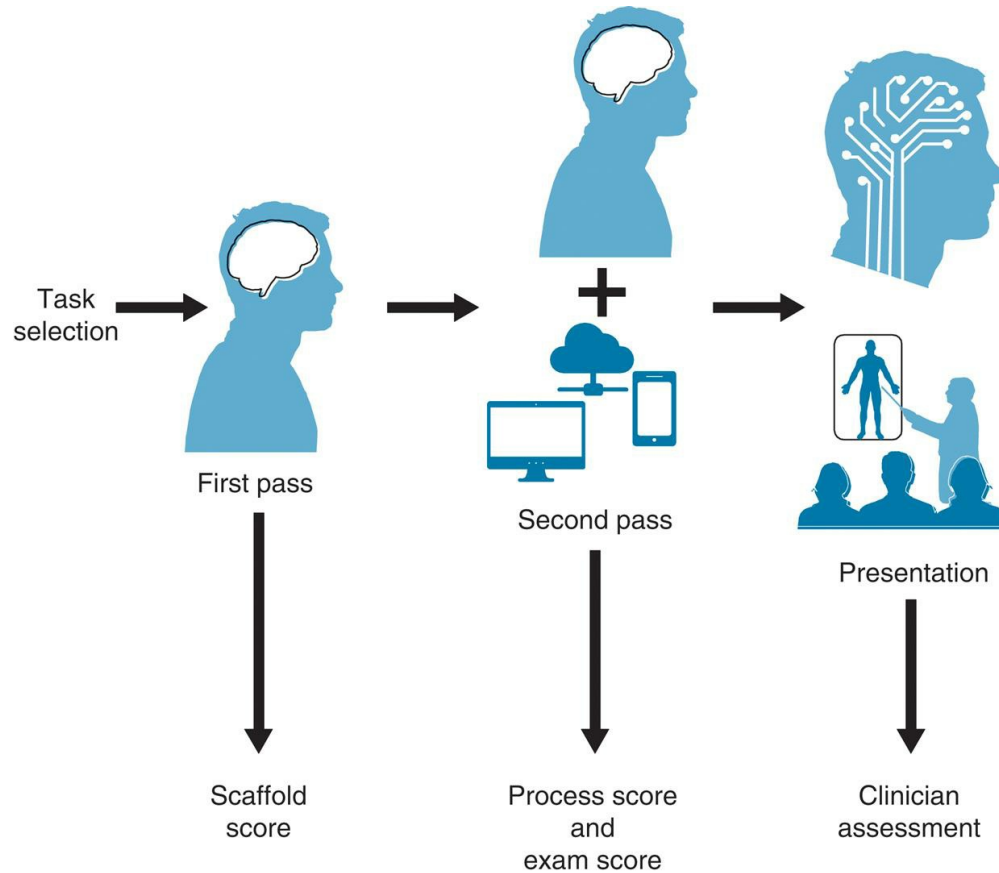


FIG. 32.3 The triple jump exercise in the era of ubiquitous information. (Modified from Brain by Wes Brezell from the Noun Project; Cloud Server by Creative Stall from the Noun Project; Computer Icon by Creative Stall from the Noun Project; Mobile Phone by Cengiz SARI from the Noun Project.)



Tip

Following the learner's digital trail, collection of experience data can be achieved via the Experience API (application programming interface [xAPI]) and a Learner Record Store. <http://experienceapi.com/overview>.

Evaluating and weighing evidence to make decisions; recognizing patients and interprofessional colleagues as additional sources of information

A discriminating user of all the information resources and knowledge repositories of our digital healthcare environment must be able to deal with and handle uncertainty. The third competency ensures that learners will have the knowledge and skills to evaluate, include/exclude and weigh all available evidence. Some of the evidence will come from clinical guidelines and e-textbooks. Real-time evidence will be generated from the learning health system, and the responses that the system generates will be accompanied by confidence measures for the results. In many scenarios, clinicians will be faced with incomplete and/or conflicting information. Therefore part of the knowledge scaffolding of the physician in the digital age must relate to decision making under uncertainty.



Tip

Rather than teaching evidence-based medicine as a block early or late in a programme, consider threading it through every year.

To achieve the delivery of this competency to learners, increased curricular attention must be given to topics like formal decision modelling and analysis; evidence-based decision making; critical evaluation of the literature; metaanalysis; and data mining and signal detection. In recent years, medical schools have begun to introduce to the topic of evidence-based medicine to our learners, and it has become more prevalent in clinical practice. It has been a struggle to make this appear relevant to learners and practising physicians alike. The need for this competency across the continuum of learners will become increasingly apparent as we continue to move into the era of ubiquitous information.

Assessment of uncertainty/shared decision making

Objective Structured Clinical Examinations (OSCEs) can be designed to assess for this competency. A complex clinical case, with a patient that has several social or cultural considerations involved as determinants of the decision, would serve as an excellent example. Learners would need to demonstrate their ability to gather the necessary information and incorporate statements about their confidence in the knowledge they have, or have obtained, into the explanation of their decision.

**Tip**

How learners weigh evidence and handle uncertainty can be incorporated into Mini-CEX (clinical evaluation exercise) assessments.

Summary

It is an exciting time in healthcare as more of the information about patients and medical knowledge become available digitally. Although there are baseline competencies required for practice in this new era of ubiquitous information, the three key competencies we have outlined will be critical to the success of physicians in clinical practice beyond the next decade. The ability to sense the gaps in one's knowledge will serve to reduce medical errors by improving the confidence of physicians in their medical knowledge. The ability to quickly form appropriate clinical questions and access relevant, reliable sources of information will prevent physicians from becoming overwhelmed by the large volume of information at hand. Finally, the ability to evaluate and weigh the available information will help physicians handle the uncertainty that exists in their environment.

References

- [Blumenthal, 2010](#) Blumenthal D. *Expecting the unexpected: health information technology and medical professionalism. Medical Professionalism in the New Information Age* New Brunswick, NJ: Rutgers University Press; 2010;8–22.
- [Dexter et al., 2012](#) Dexter J, Koshland G, Waer A, Anderson D. Mapping a curriculum database to the USMLE Step 1 content outline. *Medical Teacher*. 2012;34(10):e666–e675.
- Friedman et al., 2016 Friedman CP, Donaldson KM, Vantsevich AV. Educating medical students in the era of ubiquitous information. *Medical Teacher*. 2016;38(5):504–509.
- [Friedman et al., 2010](#) Friedman CP, Wong AK, Blumenthal D. Achieving a nationwide learning health system. *Science Translational Medicine*. 2010;2 57–29.
- Gallardo-Echenique et al., 2015 Gallardo-Echenique EE, Marques-Molias L, Bullen M, Strijbos JW. Let's talk about digital learners in the digital era. *International Review of Research in Open and Distributive Learning*. 2015;16(3):156–187.
- [Quirk, 2006](#) Quirk ME. *An emerging paradigm for medical education. Intuition and metacognition in medical education: keys to developing expertise* New York, NY: Springer Pub. Co; 2006;1–10.
- [Sandars, 2009](#) Sandars J. The use of reflection in medical education: AMEE Guide No 44. *Medical Teacher*. 2009;31(8):685–695.
- [Smith, 1993](#) Smith RM. The triple-jump examination as an assessment tool in the problem-based medical curriculum at the University of Hawaii. *Academic Medicine*. 1993;68(3):366–372.
- [Thompson, 2013](#) Thompson P. The digital natives as learners: technology use patterns and approaches to learning. *Computers and Education*. 2013;65:12–33.
- [Triola et al., 2010](#) Triola MM, Friedman E, Cimino C, et al. Health information technology and the medical school curriculum. *The American Journal of Managed Care*. 2010;16(12 Suppl. HIT):SP54–SP56.

SECTION 5

Assessment

OUTLINE

- 33 Concepts in Assessment Including Standard Setting
- 34 Written Assessments
- 35 Performance and Workplace Assessment
- 36 Portfolios, Projects and Theses
- 37 Feedback, Reflection and Coaching: Tools for Continuous Learning
- 38 The Assessment of Attitudes and Professionalism
- 39 Programmatic Assessment

Concepts in Assessment Including Standard Setting

John Norcini and Danette W McKinley

Trends

- Validity is not obtained or achieved. Instead, evidence is collected to support the interpretation of assessment results. These interpretations, or validity arguments, are supported through information that is collected over time. A framework to view assessments through this validity lens is provided in the chapter.
- As attention shifts to competency based, student-centred learning, more attention has been paid to formative assessment, with an emphasis on supporting and creating learning. Research has begun to identify the effectiveness of formative assessment that emphasizes feedback, particularly in workplace settings.
- Historically, there has been a focus on the quality of individual assessments with less attention paid to how multiple measures are combined to achieve a variety of purposes. There is a growing interest in 'systems thinking' which emphasizes the interconnections among assessments, how they work over time, how they operate within the broader educational context, and how they relate to various stakeholders.

Key concepts

- Blueprint: a table of specifications that provides validity evidence by creating an explicit link between test content and scores.
- Formative assessment: tests that are typically administered during training, with a focus on learning and feedback.
- Psychometrics: models that account for theories of what happens when someone takes a test. They provide information on optimal test length, evidence of the validity of score inferences, and confidence that can be placed in test results.
- Reliability: an estimate of the amount of error in test scores.
- Summative assessment: tests that produce scores that contribute to decisions of some type.
- Validity theory: A framework for collection of evidence to support the interpretations made based on test results.

Introduction

Even a cursory review of the assessment literature reveals a bewildering array of dichotomies and concepts. These are often overlapping, and authors sometimes use them with less precision than is desirable, especially for the clinical teacher attempting to make sense of assessment for the first time. The purpose of this chapter is to identify some of these concepts and provide background to their meaning, development, and use.

Measurement theories

Test theories or psychometric models seek to explain what happens when an individual takes a test ([Crocker & Algina, 1986](#)). They provide guidance about how to select items, how long tests need to be, the inferences that can be drawn from scores, and the confidence that can be placed in the final results. Each model makes different assumptions and based on those assumptions, different benefits accrue. There are many psychometric models, but three deserve attention here because they are used frequently in medical education.

Classical test theory (CTT) has been the dominate model in testing for decades, with roots in the late 19th and early 20th century ([Lord & Novick, 1968](#)). It assumes that an individual's score on a test has two parts: true score (or what is intended to be measured) and error. To apply CTT to practical testing situations, a series of very restrictive assumptions needs to be made. These assumptions are often violated in practice, but even when that happens, it seldom makes a practical difference.

A number of useful concepts and tools have been developed based on CTT, including reliability, which indicates the amount of error in observed scores, and item statistics which help with the process of test development.

Generalizability theory (GT) rose to prominence with the publication of a book by Cronbach and colleagues in 1972 ([Cronbach et al., 1972](#)). Like CTT (which is a special case of GT), it assumes that an individual's score on a test has two parts: true score and error. However, it makes relatively weak assumptions, so it applies to a very broad range of assessments.

GT offers a number of advantages over CTT ([Brennan, 2001](#)). For example, GT allows the error in a test to be divided among different sources and it supports a distinction between scores that are intended to rank individuals as opposed to scores that are intended to represent how much they know.

With considerable interest starting in the 1970s, the use of item response theory (IRT) has grown substantially, especially among national testing agencies ([Hambleton et al., 1991](#)). Unlike GT, IRT makes very strong assumptions about items, tests and individuals. These assumptions are difficult to meet so there are a number of different IRT models, each with assumptions that are suitable for particular assessment situations.

When the assumptions are met, many practical benefits accrue. For example, individual scores are independent of exactly which items are taken and item statistics are independent of the individuals who take the test.



Tip

Compared with CTT, GT and IRT provide different but powerful advantages. However, for most practical day-to-day work any of the test theories suffice.

Types of assessment

Assessments can be classified in a variety of different ways and many of them are reasonable. One useful classification of assessments is as formative, summative or diagnostic ([Hanauer et al., 2009](#)). Although some assessments are designed to simultaneously serve more than one purpose (e.g., be summative but also provide formative information), it is very difficult to do this well and one of the purposes usually dominates. In the end, it is better to develop a good system of assessment which incorporates different tests methods each of which serves a single purpose well. The assessment system can be designed to match a variety of purposes, including learning and decision making, using different assessment types ([van der Vleuten et al., 2015](#)).

Formative assessment. An assessment of trainees during an educational intervention is often referred to as formative. The purpose of these assessments is twofold. First, they provide feedback to students and their teachers which is intended to guide learning. Second, there is recent work indicating that the act of assessment itself creates learning, so formative assessment is integral to education.



“Over the past 50 years, considerable energy has been devoted to the development of summative assessment. Although much work remains, good summative assessments of medical knowledge, clinical skills, and other competencies are now readily available. More recently, the focus has shifted to formative assessment and its focus on supporting and creating learning. We need to develop a much better understanding of how to build and use these types of assessments. Research has identified the effectiveness of formative assessment that emphasizes feedback, particularly in workplace-settings.”

Lefroy et al. (2015)

There are many examples of these types of assessments, one class of which is workplace-based assessment (e.g., mini-Clinical Evaluation Exercise (mini-CEX), Direct Observation of Procedural Skills (DOPS)). These often require some form of direct observation followed by assessment and then immediate feedback. Despite the fact that formative assessment is central to learning, insufficient attention has been paid to the development and refinement of these types of instruments. Of particular relevance recently, has been research on the provision of feedback (e.g., [Watling & Ginsburg, 2019](#)).

Summative assessment. An assessment of trainees designed to decide about them is generally referred to as summative. The purpose of these assessments is to determine whether the trainee has learned what has been taught. They typically contribute to decisions of some type and indicate whether the trainee is competent to move on in training or practice.

Examples of summative assessments are the examinations that occur at the end of units, courses, semesters, and years. Also summative are tests for graduation, licensure,

certification, and so on. These tests are so pervasive, especially in medical school, that when most students are asked about it, they describe all assessment as summative.

Diagnostic assessment. An assessment of trainees relevant to an educational intervention, and usually before exposure to it is generally referred to as diagnostic. Analogous to medicine, the purpose of these assessments is to determine the trainees' educational needs with the goal of optimizing learning. Often, they produce a profile which identifies areas of strength and weakness.

These types of tests are common in continuing medical education, where participants select, or are assigned to, an educational experience based on their performance. In general, they are underused in formal training where the focus remains largely on educational process. With the movement to competency-based education, and the measurement of growth in ability, these types of assessments should increase in importance.

Qualities of good assessment

There are many ways to judge the quality of an assessment. Historically, there was emphasis on the measurement properties of the test (reliability and validity) but in 1996 van der Vleuten expanded the list of qualities, pushing beyond the traditional measurement characteristics to include issues related to the test's effect, acceptability and feasibility ([van der Vlueten, 1996](#)). These criteria were reaffirmed and expanded in a consensus statement of the 2010 Ottawa Conference which resulted in the following criteria for good assessment: validity or coherence, reproducibility or consistency, equivalence, feasibility, educational effect, catalytic effect and acceptability ([Norcini et al., 2011](#)).



"Over time, most of these criteria have been presented in detail by a variety of authors and their importance is clear. More recently, however, emphasis has been placed on the catalytic effect. This criterion refers to whether an assessment provides results and feedback in such a way that learning is created, enhanced and supported. It is central to the evolving view of assessment as means of generating learning, as well as deciding the degree to which it has occurred."

Norcini et al. (2011)

In 2018 the Ottawa conference group affirmed the importance of these criteria for individual assessments but added a focus on systems which integrate several individual measures to achieve one or more purposes ([Norcini et al., 2018](#)). In the health professions, multiple assessments are needed to capture the knowledge, skills and attitudes required for competence. These assessments are often conducted in isolation and without coordination. A system of assessment considers the interconnections between assessments, how the system works over time, how it operates within the context of the larger systems in which it is contained, and how it relates to the various stakeholders. The Consensus group proposed that a system of assessment be coherent, continuous, comprehensive, feasible, purposes driven, acceptable and transparent and free from bias.

Validity theory

Determining the purpose of an assessment and then ensuring that test development, test construction and scoring support that purpose is a concern in health professions education. Validity theory presents a useful framework for considering this concern and there is a long history of its development (e.g., [Cook and Beckman, 2006](#)). For purposes of this chapter, a framework outlined by [Kane \(2013\)](#) provides a useful introduction. The framework has four components and validation is a matter of accruing evidence around each of them.



"While adequate reliability of assessment instruments is important, validity is not a statistical property of an examination. Instead, it involves an iterative process of collection of evidence to support interpretations associated with intended uses of the results."

Hawkins et al. (2018)

The scoring component is concerned with developing evidence that the assessment is administered fairly, that students are assessed appropriately and that any criteria developed are applied consistently. When the assessment is given, evidence that conditions are the same for all students supports the argument that testing is fair and testing conditions are similar regardless of who administers the test. This is also referred to as standardization. The level of difficulty of the task should be well matched to the group being tested. Scoring criteria should be applied equally to all students taking the test. No one group should have an advantage over others. The evidence collected to support the scoring argument includes meeting the criteria for reproducibility (reliability).

The generalization component requires evidence that the content of the test adequately represents the domain from which it is drawn and that enough of it is sampled to produce scores and/or decisions that are reasonably precise. Evidence of generalizability is often supported by reliability coefficients based on classical test theory, or generalizability theory.

The extrapolation component requires evidence that the scores are relevant to the construct of interest and this includes demonstrating that they were not influenced by things that are unrelated to this construct. This evidence shows that the assessment is 'coherent,' and scores relate in a manner that is expected. Additional information about this component is presented in the next section, 'Score interpretation'.

The interpretation/decision component requires that evidence be collected that shows a link between test usage and assessment results. For example, if pass/fail decisions are being made, evidence should be gathered to support the process and usefulness of the classification of those being assessed. More information about this component of validity theory is provided in the section on standards.

Score interpretation

A score is a letter or number that reflects how well an individual performs on an assessment. When a test is being developed, one of the first decisions to be made is how the scores will be interpreted: norm-referenced or criterion-referenced (Glaser, 1963). This decision has implications for how the items or cases are chosen, what the scores mean when they are being used by students, teachers, and institutions, and how the reliability or reproducibility of scores is conceived (Popham & Husek, 1969).

Norm-referenced score interpretation. When scores are interpreted from a norm-referenced perspective they are intended to provide information about how individuals perform against a group of test takers. For example, saying that a student's performance was one standard deviation above the mean indicates that he/she did better than 84% of those who took the test. It says nothing about how many questions the student answered correctly.

Norm-referenced score interpretation is especially useful in situations where there are a limited number of positions and the need to select the best (or most appropriate) of the test takers. For example, in admissions decisions, there are often a limited number of seats and the goal is to pick the best of the applicants. Norm-referenced score interpretation aids in these types of decisions. However, it is not useful when the goal is to identify how much each individual knows or can do.

Criterion-referenced score interpretation. When scores are interpreted from a criterion-referenced perspective (sometimes called domain-referenced), they are intended to provide information about how much an individual knows or can do given the domain of the assessment. For example, saying that a student got 70% of the items right on a test means that she knows 70% of what is needed. It says nothing about how the student performed in comparison to others.

Criterion-referenced score interpretation is particularly useful in competency testing. For example, an assessment designed to provide feedback intended to improve performance should yield scores interpreted from a criterion-referenced perspective. Likewise, an end-of-course assessment should produce scores that indicate how much material students have learned. However, criterion-referenced score interpretation is not useful when the goal is to rank students. Scores from criterion-referenced assessments can be particularly useful in outcome or competency-based education programmes.

One common variation on criterion-referenced score interpretation is called a *mastery* test. In a mastery test, a binary score (usually pass or fail) connotes whether the individual's performance demonstrates sufficient command of the material for a particular purpose.

Score equivalence

When an assessment is given, there are many instances when it is desirable to compare scores among trainees, against a common pass-fail point, and/or over time. Clearly, if all the trainees take the same questions or encounter exactly the same patients, it is possible to compare scores and make equivalent pass-fail decisions. Some methods, like multiple-choice questions (MCQs) and standardized patients (SPs), were created in part to ensure that all trainees would face the same challenge and their scores would mean exactly the same thing.

There are also a variety of important assessment situations when scores are not equivalent but where adjustments can be made. For example, in an MCQ or SP examination, the test items or cases are often changed over time and, despite maintaining similar content, these versions or forms of the same assessment differ in difficulty. With these methods of assessment, the issue can be addressed through test equating (Kolen & Brennan, 1995). Equating is a set of procedures, designs, and statistics that are used to adjust scores, so it is as if everyone took the same test. Although desirable, methods to adjust scores are complicated, time intensive, and labour intensive. Consequently, they are used often in national assessments and less frequently for locally developed tests.

There are also a variety of important assessment situations where scores are not equivalent and where good adjustment is not possible. For example, virtually all methods of assessment based on observed trainees' encounters with real patients yield scores (or ratings) that are not equivalent because patients vary in the level of challenge they present, and observers differ in how hard they grade. Attempts to minimize these unwanted sources of influence on scores usually take the form of wide sampling of patients and faculty (to hopefully balance out the easy and difficult patients), training of observers, and certain IRT-based methods that statistically minimize some of the differences among observers (Linacre, 1989). None of these is wholly satisfactory however, and although these types of assessments are essential to the training and credentialing of doctors, the results must be interpreted with some caution when used for summative purposes. They are well suited to formative assessment.

Standards

Assessments can be given for many reasons, but there are times when decisions are associated with the use of these instruments; decisions regarding the competency or proficiency of individuals. In these instances, it is important to categorize performance on a test, usually as pass or fail (although there may be times when more than two categories are needed). The score that separates passers from failures is called the standard or pass-fail point. It is an answer to the question, "How much is enough?" A standard is the score that separates success from failure on these assessments. Standard setting is the process of translating a description of the characteristics denoting the desired level performance into a number that applies to a test. There are two types of standards: relative and absolute.



"Standard setting is the process of translating a description of the characteristics denoting the desired level of performance into a number that applies to a particular test. The credibility of standards depends to a large degree on the standard setters and the method they use. The standard setters must understand the purpose of the test and the reason for establishing the cut score, know the content, and be familiar with the examinees. The specific method chosen to set standards is not as important as whether it produces results that are fit for the purpose of the test, relies on informed expert judgement, demonstrates due diligence, is supported by a body of research, and is easy to explain and implement."

McKinley and Norcini (2014)

Relative standards. For relative standards, the pass-fail point is chosen to separate individuals based on how well they performed compared to each other. For example, a cutting score might be selected to pass the 80% of students with the best scores. Relative standards are typically used in the same circumstances as norm-referenced score interpretation.

Relative standards are most appropriate in settings where a group of a certain size needs to be selected. For instance, in an admissions setting where the number of seats is limited and the purpose is to pick the best students, relative standards make the most sense. Relative standards are much less appropriate for assessments where the intention is to determine competence.

Absolute standards. For absolute standards, the pass-fail point is chosen to separate individuals based on how much they know or how well they perform. For example, a cutting score might be selected to pass the students who correctly answer 80% of the questions.

Absolute standards are most appropriate in settings where there is a need to determine competence. This type of standard is useful with criterion-based (or domain-based) assessment. For instance, in an end-of-year assessment where the purpose is to decide which students learned enough to progress to the next year, absolute standards

are best. They are much less appropriate for assessments where the intention is to select a certain number of students for a particular purpose.

The characteristics of the process of selecting a pass-fail point contributes to its credibility. The method selected should be easy to explain to those participating in the process and should be supported by research. It should be consistent with the purpose of assessment and those participating should be engaged in thoughtful effort (due diligence). The process should show that considerable effort was made in conceptualization of the standard and determination of the score associated with that standard.

Blueprints

The content included in an assessment is essential to the quality of the results and to provide evidence of the validity and credibility of the scores and decisions emanating from it. A good assessment starts with a good blueprint (sometimes called a table of specifications), which specifies in appropriate detail what content needs to be covered (Downing & Haladyna, 2006). This blueprint should be shared with anyone being assessed well in advance of the examination.

For example, the American Board of Internal Medicine publishes its blueprint for the Certifying Examination in internal medicine (www.abim.org). It specifies 'patient task', using patient demographics (e.g., Women's Health is 6%) to determine examination content (American Board of Internal Medicine, 2016). More than 50% of the questions must require synthesis or judgement to reach the correct conclusion. The blueprint specifies in detail the percentage of the items devoted to each of the medical content categories (e.g., cardiovascular disease is 14%, infectious disease is 9%, psychiatry is 4%) and there is a cross-cutting classification for areas like geriatric medicine (10%) and prevention (6%). Each test contributes to a primary content category and may contribute to a cross-cutting category as well (e.g., a prevention question in cardiovascular disease). Because this is a national assessment and there is so much at stake, the blueprint is very detailed. For local assessments and/or those based on fewer items or cases (e.g., Objective Structured Clinical Examinations), this level of detail is unnecessary but a blueprint is still essential to provide evidence of validity and alignment of content with assessment purpose.



"For a credentialing examination, such as certification, the content and blueprint should be based on the nature of practice, not the nature of training. Consequently, the blueprints for such examinations are often based on a job analysis. This provides validity evidence of the scores by creating an explicit link between the test content and what is done in practice."

Colton et al. (1991)

The source of content for an assessment will depend on its purpose. For example, if it intended to determine what has been learned as part of a course then the content should

be drawn from the syllabus. However, if it is intended to indicate readiness for practice then it should be based on the patient problems that constitute that practice. There are a variety of sophisticated designs and statistical methods for supporting the development of a blueprint that are suitable for assessments where the stakes are high ([Downing & Haladyna, 2006](#)).

Self-assessment

Self-assessment has occupied a central role in medical education for some time. In general, it is assumed that the individual chooses what he/she believes is important to assess, selects how the assessment will be done, and then uses the results of the assessment to confirm strengths and address weaknesses. Within this context, virtually all methods of assessments can be used for self-assessment.



"Of the 20 comparisons between self- and external assessment, 13 demonstrated little, no, or an inverse relationship and seven demonstrated positive associations. A number of studies found the worst accuracy in self-assessment among physicians who were the least skilled and those who were the most confident. These results are consistent with those found in other professions."

Davis et al. (2006)

For society to grant doctors and other professionals the ability to self-regulate, it must assume that they are able to self-assess accurately. This ability has in turn been expected to drive day-to-day practice and lifelong learning. As important, accurate self-assessment is what allows doctors to limit their practices to areas of competence. Given this critical role, it is not surprising that medical education is expected to develop this ability in trainees and practitioners.

Despite its importance, there is good evidence that doctors and other professionals are not very good at self-assessment. A review of the literature by [Davis et al. \(2006\)](#) concluded that although the literature was flawed, doctors have a limited ability to self-assess accurately. [Eva and Regehr \(2005\)](#) added that self-assessment is a "is a complicated, multifaceted, multipurpose phenomenon that involves a number of interacting cognitive processes." Given its complexity, there is neither the research nor the educational strategies available at the moment to suggest that self-assessment in its purest form can be relied upon.

Three important suggestions have been offered to make self-assessment more effective by ensuring that it is guided ([Galbraith et al., 2008](#)). First, it is essential that the self-assessment be chosen to be relevant to the learning or practice experience of the student or doctor; it should not be completely self-selected. Second, the self-assessment should be directly linked to educational experiences that can remediate difficulties. Third, the results of self-assessment should be periodically validated by external assessments.

Objective versus subjective assessments

In the literature, it is not unusual for authors to refer to some forms of assessment as 'objective' and others as 'subjective'. Generally speaking, objective assessments have one or more clearly correct or incorrect responses or behaviours that can be readily observed. Examples of objective assessments include MCQs and checklists. In contrast, subjective assessments often require judgements about a response or set of behaviours. Examples of subjective assessments include essay questions and rating forms.



"There is much research comparing checklists (seen as objective) and global ratings (seen as subjective). In fact, scores from checklists are slightly more reliable and global ratings are slightly more valid. But, the differences are relatively small so that using either methodology can produce good results."

Norcini and Boulet (2003)

In many ways, this is not a useful dichotomy. MCQs are arguably the most objective of the assessment methods. Nonetheless, judgements are made through the test construction, scoring, and standard-setting process. Creation of the blueprint requires judgements about importance and frequency. When individual items are written, the author makes judgements about the patient's age, the site of care, which diagnostic tests and treatments are included among the potential responses, and so on. For scoring, judgements need to be made as to whether/how much to weight each response, how to aggregate those weights, what scale to report them on, and where the pass-fail point will be.

All assessment requires judgement. The only difference among the various methods is the way in which those judgements are gathered, and the number of experts involved. MCQs have an advantage because many experts can contribute to test creation so that items can be eliminated, different perspectives can be represented, and the product (i.e., the final test) can be endorsed by the group. In addition, many different clinical situations can be sampled efficiently. The exact same judgements are made in a bedside oral examination, but the method limits the number of experts and clinical situations that can be included. To the degree that the number of experts and patients can be increased, the 'objectivity' of the oral examination approaches that of MCQs.

Summary

The purpose of this chapter is to identify some of the concepts fundamental to assessment and to provide background to their meaning, development and use. The test theories underlying assessment have been briefly described as have the types of assessment to which they apply and the criteria against which to judge their success. The importance of test content, as highlighted by the blueprint, plays a central role in the quality of an assessment and more technical matters like score interpretation, equivalence, and standards must be aligned with the purpose of assessments, so they perform as intended. Finally, much is written about self-assessment and 'subjective' versus 'objective' measurement. The chapter has suggested some potential concerns and clarifications around these popular topics.

References

- American Board of Internal Medicine, 2016 American Board of Internal Medicine. Internal Medicine Certification Examination Blueprint. Available at: <http://www.abim.org/~media/ABIM%20Public/Files/pdf/exam-blueprints/certification/internal-medicine.pdf>. Accessed 2016.
- Brennan, 2001 Brennan RL. *Generalizability theory* New York: Springer-Verlag; 2001.
- Colton et al., 1991 Colton A, Kane MT, Kingsbury C, Estes CA. Strategies for examining the validity of job analysis data. *Journal of Educational Measurement*. 1991;28:283–294.
- Cook and Beckman, 2006 Cook DA, Beckman TJ. Current concepts in validity and reliability for psychometric instruments: theory and application. *The American Journal of Medicine*. 2006;119(2):166.e7–166.e16.
- Crocker and Algina, 1986 Crocker L, Algina J. *Introduction to classical and modern test theory* Fort Worth TX: Harcourt, Brace, & Jovanovich; 1986.
- Cronbach et al., 1972 Cronbach LJ, Gleser CG, Rajaratnam N, Nanda H. *The dependability of behavioral measurements* New York: Wiley; 1972.
- Davis et al., 2006 Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *Journal of the American Medical Association (JAMA)*. 2006;296(9):1094–1102.
- Downing and Haladyna, 2006 Downing SM, Haladyna TM, eds. *Handbook of test development*. Mahwah, NJ: Erlbaum; 2006.
- Eva and Regehr, 2005 Eva KW, Regehr G. Self-assessment in the health professions: a reformulation and research agenda. *Academic Medicine*. 2005;80(Suppl 10):s46–s54.
- Galbraith et al., 2008 Galbraith RM, Hawkins RE, Holmboe ES. Making self-assessment more effective. *Journal of Continuing Education in the Health Professions*. 2008;28:20–24.
- Glaser, 1963 Glaser R. Instructional technology and the measurement of learning outcomes: Some questions. *American Psychologist*. 1963;18:519–521.
- Hambleton et al., 1991 Hambleton RK, Swaminathan H, Rogers HJ.

Fundamentals of item response theory Newbury Park, CA: Sage Press; 1991.

- [Hanauer et al., 2009](#) Hanauer DI, Hatfull GF, Jacobs-Sera D. *Active assessment: assessing scientific inquiry* Springer 2009.
- [Hawkins et al., 2018](#) Hawkins M, Elsworth GR, Osborne RH. Application of validity theory and methodology to patient-reported outcome measures (PROMs): building an argument for validity *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment. Care and Rehabilitation*. 2018;27(7):1695–1710.
- [Kane, 2013](#) Kane MT. Validating the interpretations and uses of test scores. *Journal of Educational Measurement*. 2013;50(1):1–73.
- [Kolen and Brennan, 1995](#) Kolen MJ, Brennan RL. *Test equating: methods and practices* New York: Springer-Verlag; 1995.
- [Lefroy et al., 2015](#) Lefroy J, Watling C, Teunissen PW, Brand P. Guidelines: the do's, don'ts and don't knows of feedback for clinical education. *Perspectives on Medical Education*. 2015;4(6):284–299.
- [Linacre, 1989](#) Linacre JM. *Many-facet Rasch measurement* Chicago: MESA Press; 1989.
- [Lord and Novick, 1968](#) Lord FM, Novick MR. *Statistical theories of mental test scores* Reading MA: Addison-Wesley Publishing Company; 1968.
- [McKinley and Norcini, 2014](#) McKinley DW, Norcini JJ. How to set standards on performance-based examinations: AMEE Guide No 85. *Medical Teacher*. 2014;36:97–110.
- Norcini et al., 2011 Norcini J, Anderson B, Bollela V, et al. Criteria for good assessment: consensus statement and recommendations from the Ottawa 2010 Conference. *Medical Teacher*. 2011;33:206–214.
- [Norcini et al., 2018](#) Norcini J, Anderson MB, Bollela V, et al. Consensus framework for good assessment. *Medical Teacher*. 2018;40(11):1102–1109.
- [Norcini and Boulet, 2003](#) Norcini J, Boulet J. Methodological issues in the use of standardized patients for assessment. *Teaching and Learning in Medicine*. 2003;15(4):293–297.
- [Popham and Husek, 1969](#) Popham WJ, Husek TR. Implications of criterion-references measurement. *Journal of Educational Measurement*. 1969;6:1–9.
- [van der Vleuten, 1996](#) van der Vleuten C. The assessment of professional competence: developments, research and practical implications. *Advances in Health Sciences Education*. 1996;1:41–67.
- [van der Vleuten et al., 2015](#) van der Vleuten CPM, Schuwirth LWT,

Driessen EW, Govaerts MJB, Heeneman S. Twelve tips for programmatic assessment. *Medical Teacher*. 2015;37(7):641–646.

[Watling and Ginsburg, 2019](#) Watling CJ, Ginsburg S. Assessment, feedback and the alchemy of learning. *Medical Education*. 2019;53(1):76–85.

Written Assessments

Lambert W T Schuwirth and Cees van der Vleuten

Trends

- With respect to what an item tests, the content of the question is essential, and the question format is not; open-ended questions do not necessarily test higher-order cognitive skills and multiple-choice do not necessarily test only factual recall.
- The most important aspect of item writing is quality control. Staff development and peer review are indispensable in ensuring high-quality assessment.
- There are no question types that are inherently better than others; every method has its own advantages and disadvantages; put differently: its indications, contraindications and side-effects.

Key concepts

- Comprehensive assessment: the notion that because competence is multifaceted, no single assessment can capture it but a whole programme of assessment with various instruments is needed.
- Stimulus-response format: every item or assessment assignment consists of what is being required from the candidate and how the candidate is expected to respond to what is required. The former is the stimulus and the latter is the response format. Distinction between both is essential in thinking about validity of the assessment.
- Items as diagnostic tools: in item review processes, each item is seen as a diagnostic tool for competence, distinguishing between those candidates who have the knowledge or competence as true positives and those who do not as true negatives. Item review aims to eliminate sources for false-positive and false-negative responses.

Introduction

Despite the increasing popularity of workplace-based assessment, written assessments are still probably the most widely used assessment methods. Their logistical advantages and their cost-effectiveness probably contribute to their popularity. Compared with many other methods they are easier and more cost efficient to construct, while yielding reliable scores. They are not a panacea though, as no single assessment method is (Van der Vleuten, 1996). For comprehensive testing of competence, a variety of written and nonwritten methods is needed. Currently, programmatic assessment is gaining popularity rapidly (Van der Vleuten & Schuwirth, 2005). In this approach, different assessment methods are purposively combined to let strengths of one method compensate for the weaknesses of another. Of course, it is necessary to know these strengths and weaknesses; in this chapter, we will discuss the major strengths and weaknesses of written assessment methods.

Question format

Often, a distinction is made between open-ended and closed question formats, and multiple-choice questions are seen as closed formats.

Because of this, multiple-choice items are generally deemed unfit for testing of higher-order cognitive skills (e.g., medical problem-solving), because the correct answer can be provided by merely recognizing it from the options, the so-called cueing effect (Hurlburt, 1954; Schuwirth et al., 1996). From the literature comparing response formats, however, it has become clear that the response format (open-ended or closed) is not so important, but that the stimulus (what you ask) is essential (Norman et al., 1996; Ward, 1982).



Tip

The positive cueing effect is considered as a disadvantage of the MCQ, and has been documented consistently. However, MCQs apparently also cue in the opposite direction: they can lead the examinee to choose the wrong answer.

Consider, for example, the following two questions regarding the response format:

You are a general practitioner and you have made a house call on a 46-year-old patient. She appears to have a perforated appendix, and she shows signs of a local peritonitis. Which is the best next step in the management?

And

You are a general practitioner and you have made a house call on a 46-year-old patient. She

appears to have a perforated appendix and she shows signs of a local peritonitis. Which of the following is the most appropriate next step in the management?

1. Give pain medication and reassess her situation in 24 hours;
2. Give pain medication and let her drive to the hospital in her own car;
3. Give no pain medication and let her drive to the hospital in her own car;
4. Give pain medication and call an ambulance;
5. Give no pain medication and call an ambulance.

Between these two questions there is very little difference in what is asked, whereas the way the response is recorded differs.

Now consider these two questions regarding stimulus format:

What is the most prevalent symptom of meningitis?

And

Make a SWOT (strengths, weaknesses, opportunities and threats) analysis of the government's regulations to reduce the waiting list in the healthcare system.

In these questions, the response format is similar, but the content of the questions is completely different. The expected thought processes of the second question are very different to those of the first.



Tip

Stimulus formats: the content of question will determine the thought process required to answer it.

For the rest of this chapter, we will use the distinction between response and stimulus formats.

Quality control of items

No matter which assessment format is used, quality of the examination is always related to quality of the individual items. So, it is useless to discuss strengths, weaknesses and uses of different item types if optimal care was not taken to ensure their quality. One aspect of the quality of an item is its ability to discriminate between those candidates with sufficient knowledge and those without, as if items were 'diagnostic' tools for 'medical competence'. This implies that when a student with insufficient knowledge answers a question correctly, there is a false-positive result, and the opposite is a false-negative result. In quality-control procedures before test administration, the diagnosis and elimination of sources of false-positive and false-

negative results are essential ([Verhoeven et al., 1999](#)). Other aspects, for example, relevance of items, alignment with curricular goals, and item analysis and student feedback on individual items are also important quality control factors, but in this chapter, we will focus on the quality aspects of individual items.

Response formats

Short-answer open-ended questions

Description

This is an open-ended question type, requiring the candidate to generate a short answer of often one or a few words. For example:

The tendon of which muscle is most often affected in the condition 'tennis elbow'?

When to use and when not to use

Open-ended questions generally take time to answer and consequently, fewer items can be asked per hour of testing time. There is a relationship between the reliability of test scores and the number of items, and so open-ended questions can lead to less reliable scores per hour of testing time. Also, they need to be hand marked, making them logistically less efficient. When the number of realistic possible answers in real life is high or when spontaneous generation of the answer is essential, there are good reasons for using short-answer open-ended questions.

So, a question such as:

Which kidney is positioned superior to the other one?

is not efficient as an open-ended question; there are only two possible answers and spontaneous generation is not essential.

On the other hand, this question:

A 65-year old man consults you with vague complaints of fatigue, thirst and poor healing of wounds.

Which diagnosis should be thought of spontaneously?

would be not be asked in a multiple-choice format.

Therefore as a rule of thumb, it is best to restrict using short-answer open-ended questions to when the content of the question really requires it.

Tips for construction

Use clearly phrased questions to avoid students misreading the item. You may expect your students to be good readers but when reading ability is what is tested, it will be a source of measurement error ('construct-irrelevant variance'). Use short sentences and avoid double negatives. If in doubt as to whether to use more words for clarity or fewer words for brevity: opt for more clarity.

Construct well-defined answer keys in which both correct and incorrect answers are clarified but also possible alternative answers are listed. This is especially important if

more than one person marks the test papers.

Make sure candidates are clear about what kind of answer is expected. Candidates must easily understand what specific type of answer is expected, or what level of detail. For example, to a question on chest infection, the expected answer could be pneumonia, bacterial pneumonia or pneumococcal pneumonia. I may also be unclear what type of answer is expected as, for example, in:

What is the main difference between the left and the right lung?

Is the expected answer here that one is a mirror image of the other, the number of lobes, the angle of the main bronchus, the surface or the contribution to the gas exchange and so on? Questions may not become 'guess what I want you to know'-type of questions.

It is also useful to use a maximum word count for the answer, and more important: stick to it when marking. Students may apply a shot-gun approach, writing down as much as they can in the hope that part of their response will be correct. By limiting the length of the answer, this can be prevented.

Use multiple markers effectively. If more than one marker is involved in marking the test papers, it is better to have one marker score the same item(s) for all students and another marker score another set of items for all students than to have one marker mark the whole test for one group of students and another the whole test for another group of students. In the latter case, the student can be advantaged by a mild marker or disadvantaged by a harsh one; in the former, a group of markers will be used to produce the scores for individual students and marker differences will average out within the group of markers. This leads to a better reliability with the same effort.



Tip

For short-answer open-ended questions, it should be clear beforehand what would be incorrect answers.

Essay questions

Description

Essay questions are open-ended question types requiring a longer answer. Ideally, they ask the candidate to describe a reasoning process, evaluate a given situation or specifically, to apply concepts that were learned in one case to a new case. An example is:

John and Jim, both 15 years old, are going for a swim in the early spring. The water is very cold. John proposes a challenge: who can stay underwater the longest. They decide to give it a go. Before entering the water, John takes one deep breath of air, whereas Jim breathes deeply about 10 times and dives into the cold water. When John cannot hold his breath

anymore, he surfaces. Much to his shock, he sees Jim at the bottom of the swimming pool. He manages to get Jim out of the water, and a bystander starts resuscitation.

Explain at the pathophysiological level what has happened to Jim, why he became unconscious, and why this has not happened to John.

Of course, it is important that this situation of John and Jim is new to the students, and that it has not already been explained during the lectures or practicals.

A question such as:

Explain the Bohr effect and how it influences the O_2 saturation of the blood

is, therefore less suitable as an essay type of question. Although the knowledge asked for may be relevant, the question asks for reproduction of factual knowledge, which is more efficiently done with other formats.

When to use and when not to use

It is essential to use essay questions only for specific purposes. The main reason for this is the lower reliability and the need for (expert) hand scoring. Essay questions are best used when the answer requires spontaneous generation of information and when more than a short text is required. Examples are:

- evaluating a certain action or situation, for example:

Make a SWOT analysis of the government's new regulations to reduce waiting lists in the healthcare system

- application of learned concepts to a new situation or problem, for example:

During your course you have learned the essentials of the biofeedback mechanism of ACTH (adrenocorticotrophic hormone). Apply this mechanism to the control of diuresis.

- generating solutions, hypotheses, research questions
- predicting or estimating
- comparing, looking for similarities or discussing differences.

It can be difficult to mark essay answers without being influenced by the student's literary style, and some may argue it should count and others that it should not. There is no general rule about this, and it is best to be clear about the purpose of the examination. If the purpose of the test is merely to assess the knowledge and understanding of the student, their literary style is not important. However, when the purpose is to assess whether the student can explain a certain phenomenon or concept, the style is important.



Tip

It can be difficult to mark essay answers without being influenced by the student's literary style

Tips for item construction

For essay questions, the same item construction suggestions apply as for short-answer open-ended questions:

- The question must be phrased as clearly as possible; the candidate should understand what is expected.
- The answer key must be written and produced before the test.

The maximum length of the answer must be stipulated, to ensure a concise response and avoid a shot-gun approach.

A special type of essay questions is the modified essay question. This consists of a case followed by a number of questions. Often, these questions follow the case as it unfolds. This can lead to the problem of interdependency of the questions; candidates answering the first question incorrectly are more likely to answer all subsequent parts of the question incorrectly too. This is a psychometric problem that can only be avoided by test administrations in which candidates must confirm answers before they are allowed to proceed to the next question.

True-false questions

Description

True-false questions are statements for which the candidate has to indicate whether it is true or false. For example:

stem: For the treatment of Legionella pneumophila pneumonia, a certain antimicrobial agent is most indicated. This is:

item: Erythromycin True/False

The first part, the stem, in which information is given to the candidate, is always correct. The item is the part of which a candidate has to decide whether it is true or false.

When to use and when not to use

True-false questions can cover a broad domain of a discipline in a short period of time, allowing for broad sampling. They are often used for testing of factual knowledge, and this is probably what they are most suited for. However, they have some inherent disadvantages. First, they are difficult to construct flawlessly. Careful item construction is needed to ensure that the answer is defensively true or false, which can lead to artificial formulations. For example:

Stem: Certain disorders occur in conjunction with each other more often than is to be expected on the basis of pure coincidence. This is the case for:

item: diabetes and atherosclerosis True/False

The second disadvantage is that when candidates answer a false-keyed item correctly, one can only conclude that they knew that the statement was untrue, and not necessarily that they know what would have been the correct fact. For example, the following question:

Stem: For the treatment of an acute gout attack in elderly patients, certain drugs are indicated. Such a drug is:

item: allopurinol True/False

If a candidate answers 'False', one cannot conclude that he or she would have known which drugs are indicated.

Tips for item construction

Stems are almost always necessary or at least very helpful. When you place all information in the stem, which is not part of the question, it is immediately clear to the candidate what information must be considered for the answer and what not. Also this way, many of the most frequent item construction flaws can be avoided.

Avoid semiquantitative terminology at all costs. Words such as 'often' and 'seldom' are difficult to define because different people assign different meanings to them. In such cases, whether the answer is 'true' or 'false' becomes a matter of opinion rather than a fact. Typical solutions are questions with more unambiguous quantities; for instance:

Stem: In a certain percentage of patients with acute pancreatitis, the disease is self-limited.

Item: This percentage lies closer to 80% than to 50%.

Also avoid terms that are too open or too absolute. Words such as 'can', 'is possible', 'never' and 'always' lead test way students to the correct answer. The most probable answer to statements that are too open, is 'true', and the most probable answer to statements that are too absolute, is 'false'. The same applies to equality, synonymity, et cetera.

A further suggestion is to ensure the question is phrased such that the answer is defensively correct.

Stem: The cause of atherosclerosis is:

tem: hypercholesterolaemia.

In this case, one could argue that there are many causes or that there is a chain of

aetiological factors causing atherosclerosis. In such a case, for example, it would be better to ask for risk factors than causes.

Finally, it is important to avoid double negatives, especially in true/false questions, as the answer key 'false' is likely to act as a negative as well. Unfortunately, this cannot be avoided in all cases:

Stem: In patients with hypertension certain groups of drugs are contraindicated. Such a group of drugs is:

Item: corticosteroids. False.

This double negative 'contraindicated' and 'false' (answer key) cannot simply be removed by using a combination 'indicated' and 'true' because that would make the question incorrect.

Multiple-choice questions

Description

This is the most well-known item format. It is often also referred to as single-best option multiple-choice. These questions consist of a stem, a question (called the lead-in) and a number of options. The candidate has to select which of the options is the (most) correct one.

Stem: During resuscitation of an adult, compressions of the thorax have to be performed to produce circulation. For this, one hand has to be placed on the sternum and the other has to be placed on this hand to give correct compressions.

Lead in: Which of the following options indicates the most correct position of both hands?

Options:

1. the junction between manubrium and sternum
2. the superior half of the sternum
3. the middle of the sternum
4. the inferior half of the sternum
5. the xiphoid process of the sternum

When to use and not to use

Multiple-choice items may well be the most flexible question type. Although they may not always be simple to produce flawlessly, they are easy to administer. Answering and scoring are not time-consuming, and they are logistically efficient. They are best used if broad sampling of the domain is required and large numbers of candidates are to be tested. They produce fairly reliable scores per hour of testing time. The two main situations in which multiple-choice questions should not be used are:

- When spontaneous generation of the answer is essential (this is explained in the paragraph of short-answer open-ended questions)
- When the number of realistic options is too large.

In all other cases, multiple-choice questions are a good alternative to open-ended questions.

Tips for item construction

The general tips mentioned in the preceding sections, all pertain to multiple-choice questions as well (clear sentences, defensibly correct answer key, et cetera), but there are some tips that apply uniquely to multiple-choice questions. The first is to use equal alternatives.

Sydney is:

- A the capital of Australia
- B a dirty city
- C situated at the Pacific Ocean
- D the first city of Australia

In this case, the options all relate to different aspects. To produce the correct answer, the candidate has to compare apples with oranges. A better and more focused alternative would be:

Which of the following is the capital of Australia?

- A Sydney
- B Melbourne
- C Adelaide
- D Perth
- E Canberra

Also use options of equal length. Often, the longest option is the correct one, simply because generally more words are needed to make an option correct than to make it incorrect. Students know this and will be guided by this hint.

Avoid fillers. Unfortunately, often the number of options is prescribed (e.g., 4 or 5) and sometimes only fewer realistic ones can be found. Nonsense options or so-called fillers are then an attractive solution. There is much to be said against using a prescribed, standard number of options:

- candidates will recognize the fillers and discard them immediately
- it is more difficult to estimate the real probability of students answering the item correctly by a random guessing
- it will take much item writing time to find an extra option before the author decides to use a filler and this time would be better used for another question

- authors may use combination options ('all of the above' or 'none of the above') instead, which is ill-advised.

Use simple multiple-choice formats only.

The major symptoms associated with cardiovascular disease:

- 1 are chest pain, dyspnoea and palpitations
- 2 appear to worsen during exertion
- 3 are fatigue, dizziness and syncope
- 4 appear during rest

- A (1), (2) and (3) are correct
- B (1) and (3) are correct
- C (2) and (4) are correct
- D only (4) is correct
- E all the correct

In this case, the question is unnecessarily complicated. Not only can it lead to mistakes in choosing from all the combinations—which has nothing to do with medical competence—but the combinations could also give important clues as to which answer is correct simply by logic. The rule for these formats is straightforward: do *not* use them.

A final advice is always to attempt constructing the question such that, theoretically, the answer could also be given without reviewing the options. This ensures that there is a clear and well-defined lead-in and that all the alternatives are aimed at the same aspect. So, after a stem or case description, the lead-in: '*which of the following is true?*' is too vague but the lead-in: '*which of the following is the most probable diagnosis?*' is better defined and could theoretically be answered as if it were an open-ended question.

Multiple true-false questions

Description

In this question format, more than one option can be selected by the candidate. There are two varieties. In the first variety, candidates are told how many options they should select; in the second, this is left open. The former is used when there is no clear distinction between correct and incorrect, for example:

Select the two most probable diagnoses.

The latter version is used if there is a clear distinction, for example:

Select the drugs that are indicated in this case

Scoring of such items can be done in various ways. The standard approach is to treat all options as true/false items and then regard a selected option as 'true' and the others

as 'false'. The score on the item is the total of correctly selected and nonselected options, divided by the total number of options. An alternative scoring system is to indicate the minimum of correct answers for a score of 1 and to score all other responses patterns as 0.

When to use and not to use

This format is best used when the selection of correct answers from a limited number of options is needed, and when short-answer open-ended questions cannot be used.

Tips for item construction

There are no specific tips concerning this question type other than those applying to multiple-choice and short-answer open-ended questions.

Stimulus formats

Extended-matching questions

Description

Extended-matching items consist of a theme description, a series of options (≤ 26), a lead-in and a series of short cases or vignettes ([Case & Swanson, 1993](#)). For example:

Theme: diagnosis

Options:

- a hyperthyroidism
- b hypothyroidism
- c prolactinoma
- d hyperparathyroidism
- e pheochromocytoma
- f Addison disease
- g Et cetera

Lead in: For each of the following cases, select the most likely diagnosis

Vignettes: A 45-year-old man consults you because of periods of extensive sweating. One or two times per day he has short periods during which he starts sweating heavily. His wife tells him that his face is all red during such a period. He then feels very warm. He has had this now for over 3 weeks. At first, he thought the complaints would subside spontaneously, but now he is not sure anymore. Pulmonary and card examinations revealed no abnormality. His blood pressure is 130/80 mmHg, pulse 76 regular.

When to use and when not to use

Because the questions ask for decisions and the stimuli are cases or problem descriptions, extended-matching items assess decision-making or problem-solving. The large number of alternatives reduces the effect of cueing. Because the items are relatively short and can be answered quickly, extended-matching items can cover a large knowledge base per hour of testing time. They are best used in all situations where large groups of candidates have to be tested in a feasible way.

Tips for item construction

First, determine the theme. This is important because it helps to focus all the options on the same element. To minimize the influence of cueing, it is important that all the options could theoretically apply to all the vignettes, but also that some options may not relate to any of the vignettes. The options should be short. The shorter and clearer the options, the less likely it is that any hints as to the correct answer may be given. It is best to avoid using verbs in the options.

The lead-in should be clear and well-defined. A lead-in such as: 'For each of the

following vignettes select the most appropriate option.' is too open and often indicates that the options are not homogeneous or the vignettes are not appropriately related to the options.

In constructing extended matching questions:

- determine the themes first
- keep the individual option short
- ensure that the lead in is clear and well-defined.

Key-feature approach questions

Description

Another format is a key-feature approach. It consists of a short, clearly described case or problem with a limited number (preferably 2–3) of questions asking for essential decisions or key features (Page et al., 1995). Such tests typically consist of many different short cases, enabling broad sampling of the domain and thus fairly reliable test results per hour of testing time (Schuwirth, 1998). They have also been demonstrated to be valid for the assessment of medical decision making or problem solving. Some institutes prescribe certain response formats, but key-feature cases can be used with various response formats depending on the content of the question.

For key feature approach questions:

- all the important information must be presented in the case
- the question must be directly linked to the case
- to question must ask for essential decisions

Tips for item construction

Apart from all the tips concerning the other question types, some tips are specifically pertinent to key-feature approach tests (Farmer & Page, 2005; Schuwirth et al., 1999).

Make sure all the important information is presented in the case. This pertains not only to relevant medical information, but also to contextual information (where did you see the patient, what is your function, etc.).

After you have written the questions, it is a good idea to revisit the case and to check whether all the necessary information is provided.

Make sure the question is directly linked to the case. It should be impossible to answer the question correctly if the case has not been read fully. Ideally, all the information the case must be used to produce the answer and the correct answer is dependent on a careful triangulation and weighting of all this information.

The question must ask for essential decisions. An incorrect decision must typically lead to an incorrect management of the case. So, in certain instances, the diagnosis may not be the key feature; for example, if a different diagnosis would still lead to the same management of the case. Another way to check this is to see whether the answer key would change if certain elements of the case (such as location of the symptoms or age of the patient) were to be changed.



Tip

It is ill-advised to make up cases without consulting others.

Script concordance test questions

Description

Based on cognitive theory on development of clinical expertise, the script concordance test (SCT) was developed ([Charlin et al., 2000](#)). Such tests use so-called ill-defined problems as a stimulus. A clinical scenario is presented in which not all data for the solution of the problem are provided. Subsequently, a menu of options is presented from which a candidate may score the likelihood of each option in relation to the solution of the problem on a +2 to -2 scale. An example is:

A 25-year-old male patient is admitted to the emergency room after a fall from a motorcycle, with a direct impact to the pubis. Vital signs are normal. The x-ray reveals a fracture of the pelvis with the disjunction of the pubic symphysis.

If you are thinking of: urethral rupture

and then you find: urethral bleeding

this hypothesis becomes: -2, -1, zero, +1, +2

For scoring a method called aggregate scoring is used, which takes expert variability into account. SCT tests have good reliability per hour of testing time and there are numerous publications supporting the validity for the purpose. However, the format is not entirely undisputed, especially because some argue that a finding cannot make a diagnosis both more and less probable at the same time. Yet because SCT has been specifically designed to test clinical reasoning (and not clinical decision making) it could also be argued that clinical reasoning is such an individualized process opposing options can coexist. As such, the dilemma is more between the validity of the stimulus (for individualized and creative clinical reasoning) and the scoring method (one best answer or at least a majority vote). This dilemma epitomizes the current developments in the assessment of higher-order cognitive abilities and the increased understanding of what medical competence, clinical reasoning and best patient management outcomes really entail.

Tips for item construction

Many of the tips mentioned earlier are relevant to constructing SCT items. Clear wording of the vignettes is essential, as well as careful selection of the considered diagnoses and associated problems. The developers of this format recommend the use of an expert team to construct such items and a scoring team.

**Tip**

Look for the possibility for collaboration with other departments or schools because the production of high-quality test material can be tedious and expensive.

Summary

It must be stressed again that there is no single best question format; for a good and comprehensive assessment of medical competence, a variety of instruments is needed. This chapter has provided a brief overview of various written question formats with some of their strength and weaknesses and some hints for their use. Yet, there may be many more deliberations that may play a role in the choice for certain formats; university policies may be prescriptive, legal culture may require high reliability for defensibility, resource implications may play a role and, finally, expectations of stakeholders can have an impact. All these factors need to be taken into consideration, as well as the strengths and weakness described in this chapter.

References

- Case and Swanson, 1993 Case SM, Swanson DB. Extended-matching items: a practical alternative to free response questions. *Teaching and Learning in Medicine*. 1993;5(2):107–115.
- Charlin et al., 2000 Charlin B, Roy L, Brailovsky C, Goulet F, Van der Vleuten C. The script concordance test: a tool to assess the reflective clinician. *Teaching and Learning in Medicine*. 2000;12(4):185–191.
- Farmer and Gordon Page, 2005 Farmer EA, Gordon Page G. A practical guide to assessing clinical decision-making skills using the key features approach. *Medical Education*. 2005;39:1188–1194.
- Hurlburt, 1954 Hurlburt D. The relative value of recall and recognition techniques for measuring p knowledge of word meaning, nouns, verbs, adjectives. *Journal of Educational Research*. 1954;47(8):561–576.
- Norman et al., 1996 Norman G, Swanson D, Case S. Conceptual and methodology issues in studies comparing assessment formats, issues in comparing item formats. *Teaching and Learning in Medicine*. 1996;8(4):208–216.
- Page et al., 1995 Page G, Bordage G, Allen T. Developing key-feature problems and examinations to assess clinical decision-making skills. *Academic Medicine*. 1995;70(3):194–201.
- Schuwirth, 1998 Schuwirth LWT. *An approach to the assessment of medical problem solving: Computerised Case-based Testing* University of Maastricht, Maastricht: Datawyse University press; 1998.
- Schuwirth et al., 1999 Schuwirth LWT, Blackmore DB, Mom E, Van den Wildenberg F, Stoffers H, Van der Vleuten CPM. How to write short cases for assessing problem-solving skills. *Medical Teacher*. 1999;21(2):144–150.
- Schuwirth et al., 1996 Schuwirth LWT, Van der Vleuten CPM, Donkers HHLM. A closer look at cueing effects in multiple-choice questions. *Medical Education*. 1996;30:44–49.
- Van der Vleuten, 1996 Van der Vleuten CPM. The assessment of professional competence: developments, research and practical implications. *Advances in Health Science Education*. 1996;1(1):41–67.
- Van der Vleuten and Schuwirth, 2005 Van der Vleuten CPM, Schuwirth LWT. Assessing professional competence: from methods to programmes. *Medical Education*. 2005;39(3):309–317.
- Verhoeven et al., 1999 Verhoeven BH, Verwijnen GM, Scherpbier AJJA,

Schuwirth LWT, Van der Vleuten CPM. Quality assurance in test construction: the approach of a multidisciplinary central test committee. *Education for Health*. 1999;12(1):49–60.

[Ward, 1982](#) Ward WC. A comparison of free-response and multiple-choice forms of verbal aptitude tests. *Applied Psychological Measurement*. 1982;6(1):1–11.

Performance and Workplace Assessment

Katharine Boursicot

Trends

- A focus on feedback is a critical element
- Learning through 'supervised learning events' rather than 'workplace-based assessments': assessment FOR learning
- Increased emphasis on qualitative written feedback rather than quantitative scoring
- Development of tools to explore performance in different settings, for example, clinical handover, leadership

Key concepts

- Observation of performance is critical.
- Multiple sampling enhances the validity of decisions.
- OSCE: Objective Structured Clinical Examination.
- WBA: workplace-based assessment.
- Validity: gathering the sources of evidence to justify the decisions made based on the test results.

Introduction

The apprenticeship model of medical training has existed for thousands of years: the apprentice learns from watching the master, and the master, in turn, observes the apprentice's performance and helps them improve. Performance assessment is not therefore a new concept. However, in the modern healthcare environment, with its discourse of accountability, performance assessment has an increasing role in ensuring that professionals maintain the knowledge and skills required for practice. A number of international academic and professional bodies have incorporated performance assessment into their overall assessment frameworks for licensing, training and continued professional development. In the United States, the US Medical Licensing Examination (USMLE) makes use of a structured test of clinical skills in the second stage of the licensing assessment. In the United Kingdom and Australasia, the main Royal Colleges have assessment frameworks for trainees that include a portfolio of workplace-based assessment (WPBA) tools.



"Competence describes what an individual is able to do... while performance should describe what an individual actually does in clinical practice."

Boursicot et al. (2011)

The terms performance and competence are often used interchangeably. Clinical competence is the term being used most frequently by many of the professional regulatory bodies and in the educational literature. There are several dimensions to competence, and a wide range of well-validated assessments have been developed examining these. Traditional methods focus on the assessment of competence in artificial settings built to resemble the clinical environment. However, more novel methods of performance assessment concentrate on building up a structured picture of how the individual practitioner acts in his or her everyday working life, in interactions with patients and other practitioners, using technical, professional and interpersonal skills. Miller's model [Miller \(1990\)](#), shown in [Fig. 35.1](#), provides a framework for understanding the different facets of clinical competence and the assessment methods that test these.

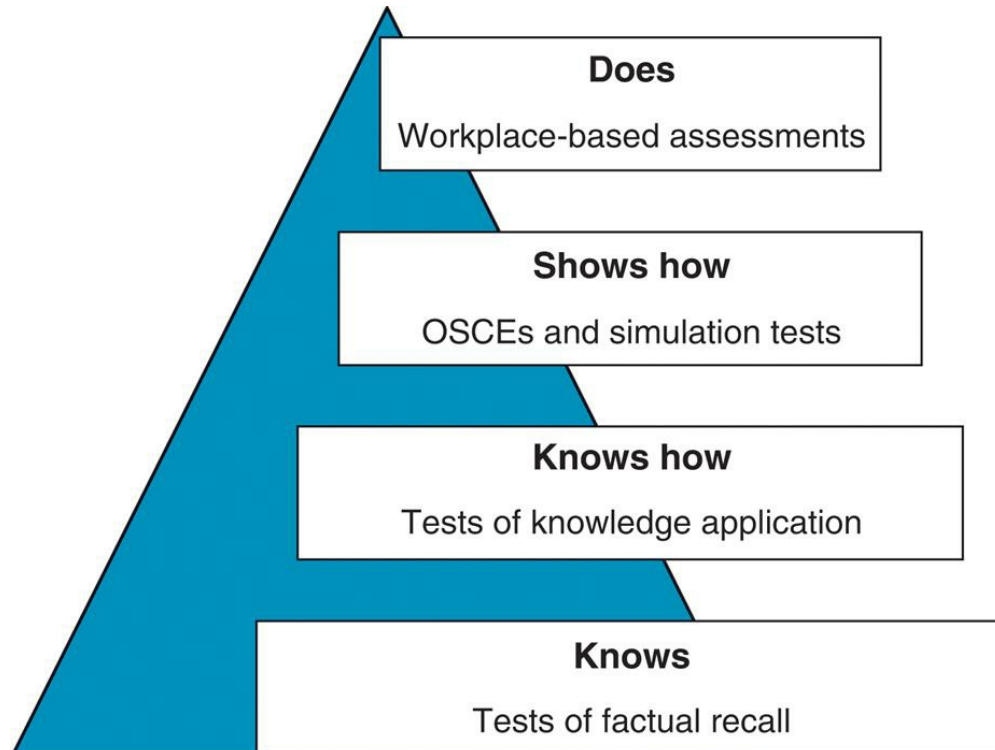


FIG. 35.1 Miller's model of competence. OSCE, Objective Structured Clinical Examination. (Modified from [Miller, 1990](#).)

In this chapter, we will look at the different methods used to assess clinical performance, which we will define as the assessment of clinical skills and behaviours in both academic and workplace settings. These methods fall in the top two layers of Miller's pyramid. We will discuss how and why they are used and some of the practical aspects to be considered for educators wishing to make use of them. We will also explore the strengths and weaknesses of the various tools and consider some of the outstanding issues concerning their use.

Choosing the right assessment

When planning assessments, it is important to consider the purpose of the assessment and where it fits into the wider educational programme: a tool is only as useful as the system within which it resides. Considerations would include how to, or indeed whether to, make pass/fail decisions; whether the assessment is 'high-stakes'; how to give feedback to candidates; and effects on the learning of candidates. For example, assessments for the purpose of certification may require different criteria than some medical school assessments, where the primary purpose is to encourage and direct the learning of students ([Downing, 2003](#)). In considering the best tools for a particular assessment system, educators should gather information from multiple sources to enable a robust evaluation, as outlined in [Box 35.1](#).

Box 35.1

Evaluating assessment tools

Validity: does this assessment tool measure what it is intended to measure?

- Assessment content relates meaningfully to learning outcomes: blueprinting
- Quality of the items has been rigorously appraised
- Results (scores) accurately reflect the candidates' performance
- Statistical (psychometric) properties of the assessment are acceptable; reproducibility and item analyses
- Pass/fail decisions are made fairly and defensibly
- Consequences of the test are considered equitably

Reliability: a measure of reproducibility of the scores, so the outcome would be the same if repeated over time

- Mathematical models calculate a reliability coefficient, the commonest being Cronbach's alpha

Generalizability: a form of reliability measure taking into account different circumstances within the same test form, for example, in different OSCE circuits. This allows better scrutiny of sources of variation

Acceptability: do all stakeholders believe in the assessment outcomes?

- Internal, e.g., teachers and learners
- External, e.g., regulatory bodies, employers, public

Cost-effectiveness: does it offer 'value for money'?

- High quality (robust and fair) balanced against cost

OSCE, Objective structured clinical examination

Educational impact is vital to consider, as inevitably assessments will influence students' learning strategies. Factors such as timing, outcomes (e.g., pass/fail) and format of the assessment will influence student behaviours. Many of the tools previously used for summative assessment are now used instead to structure supervised learning events (SLEs); interactions between learners and supervisors that lead to immediate feedback and reflective learning. The aim of SLEs is to promote engagement, feedback and development of skills while removing the emphasis on 'passing' or 'failing'.

**Tip**

Aligning the content of any assessment to the desired learning objectives is a useful way to encourage students to attend to the most important outcomes.

Assessments of clinical competence

Assessments of what a student or doctor is *able to do* can take place in artificial settings and have the advantage of being able to examine a number of individuals at the same time. The best known of these types of assessment is the Objective Structured Clinical Examination (OSCE).

Objective Structured Clinical Examination

What is it? An OSCE consists of a series of structured stations around which a candidate moves in sequence. At each station specific tasks have to be performed, usually involving clinical skills, such as history taking, clinical examination or practical skills. Different degrees of simulation may be used to test a wide range of psychomotor and communication skills, using simulated patients, part-task trainers, charts and results, resuscitation manikins or computer-based simulations. There is a time limit for each station, and the marking scheme is structured and determined in advance.



Tip

When designing an OSCE, the fundamental principle is that every candidate completes the same task in the same amount of time and is marked using the same schedule.

How is it used? The OSCE is typically used in high-stakes summative assessments at both the undergraduate and postgraduate level. The main advantages are that large numbers of candidates can be assessed in the same way across a range of clinical skills. High levels of reliability and validity can be achieved in the OSCE because of four main features (Newble, 2004):

- Structured marking schedules, which allow for more consistent scoring by assessors.
- Multiple independent observations collected by different assessors at different stations, so individual assessor bias is lessened.
- Wider sampling across different cases and skills, resulting in a more reliable picture of overall competence.
- Completion of a large number of stations, allowing the assessment to become more generalizable.

Overall, candidate scores are less dependent on who is examining, and which patient is selected than in traditional long case or *viva voce* examinations.



Tip

The key to reliability of the OSCE is the number of stations; the more stations marked by different examiners there are, the more reliable the OSCE will be. However, this has to be balanced with practicality, as clearly the longer an OSCE, the more onerous it will be for all involved.

Organization: OSCEs can be complex to organize. Planning should begin well in advance of the examination date, and it is essential to ensure that there are enough patients, simulated patients, examiners, staff, refreshments and equipment to run the complete circuit for all candidates on the day of the exam. Careful calculations of the numbers of candidates, the length of each complete circuit and how many circuits have to be run need to be made. The mix of stations is chosen in advance and depends on the curriculum and the purpose of the assessment.



Tip

Two of the simplest ways to plan a successful OSCE are to draw up a blueprint well in advance, outlining how the assessment is going to meet its goals, and to follow a standard operating procedure (SOP), describing the activities necessary to achieve these goals.

Development of a blueprint ensures adequate content validity, the level to which the sampling of skills in the OSCE matches the learning objectives of the whole curriculum. An example of a simple blueprint, detailing the different areas of a curriculum and how the stations chosen will cover these, can be seen in [Fig. 35.2](#). It is also necessary to think about the timing of the stations. The length of the station should fit the task requested as closely as possible. Ideally, stations should be practised in advance to clarify this and anticipate potential problems with the setup or the mark sheet. Thought also has to be given to the training of assessors and standardized or simulated patients.

| | History | Examination | Health promotion | Practical skills |
|----------------|---------------------------|-----------------------|--------------------------|----------------------------|
| Cardiovascular | History of palpitations | | | ECG interpretation |
| Respiratory | History of breathlessness | | Smoking cessation advice | |
| Gastro | | Abdominal examination | Explain high-fibre diet | |
| Neuro | | Gait examination | | Lumbar puncture on manikin |

FIG. 35.2 Example of an Objective Structured Clinical Examination (OSCE) blueprint. ECG,

Electrocardiogram.



"To allow insufficient time for the preparation of an OSCE is to court disaster and if the examination is to be successful advanced planning is essential."

Harden and Gleeson (1979)

Outstanding issues: The OSCE has been developed and adapted since it was originally described. The last 10 years has seen an increase in the development of high-fidelity simulation technology for use in medical education. This permits reproduction of complex conditions at any time and allows individuals and teams to practise their skills and management and gain formative feedback. The original description of OSCE marking schemes advocated checklist style mark sheets, where assessors ticked off the various elements of the task as they were performed. The advantage of this method is the reduction of assessor bias and improvement of interrater reliability. However, recent debate has questioned the suitability of this for expert practitioners, who are more likely to have moved away from strictly prescribed and regimented practice (Hodges et al., 1999). Global rating scales are increasingly being developed, which take a more holistic approach to scoring and allow for variation in practice and style.



Tip

The consensus currently is that checklists are more suited to the early, novice, stage of practice and that global ratings are better at capturing increasing levels of clinical expertise.

Thought is also being given to who is best placed to do the scoring. In most parts of the world, clinician assessors will complete the mark sheets. However, in some countries, such as the United States, scoring by standardized patients is common practice. As with all elements of assessment, consideration needs to be given to the purpose of the test and what is being assessed. If the main goal of the station is to test communication skills with patients, then a patient assessor may be the most appropriate person to judge this. However, if a complex practical task is being assessed, then a clinician with knowledge of the procedure will be better placed. Some institutions will combine clinician and patient assessments in their scoring method.

Other assessments of clinical competence

A disadvantage of the OSCE is that candidates only spend short amounts of time at each station and undertake part tasks rather than complete clinical encounters. The Objective Structured Long Case Examination Record (OSLER) attempts to address this

by holistic appraisal of the candidate's ability to interact, assess and manage a real patient without the bias and variability associated with the traditional long case (Gleeson, 1997). In the OSLER, candidates are assessed throughout history, examination and communication with a standardized patient. Two examiners review the case in advance and use a structured marking schedule. The OSLER is more reliable than the traditional long case, but a large number of different cases are needed to achieve the sort of reliability required for a high-stakes summative assessment.

Assessing performance in the workplace

Assessment of what a doctor does in practice requires assessment within the workplace. This raises a number of issues, as clearly traditional tests of competence cannot be transplanted easily into busy clinical environments. It is vital that these assessments are feasibly carried out without too much disruption to clinical work or patient care.



Tip

Using a wide range of WPBA tools helps identify strengths and weaknesses in different areas of practice, such as technical skills, professional behaviour and team working.

The main tools described in the literature and in use in medical education are outlined here, although individual institutions have developed a variety of other tools to fit their own specific needs.



“There has been concern that trainees are seldom observed, assessed, and given feedback during their workplace-based education. This has led to an increasing interest in a variety of formative assessment methods that require observation and offer the opportunity for feedback.”

Norcini and Burch (2007)

Mini-clinical evaluation exercise

What is it? The Mini-clinical evaluation exercise (Mini-CEX) was developed by the American Board of Internal Medicine to assess the clinical skills of residents, particularly focused history taking and physical examination. An assessor directly observes the practitioner's performance in 'real' clinical encounters with patients in the workplace. He or she then discusses diagnosis and management with the practitioner and gives them feedback on the encounter. The practitioner is judged in a number of clinical domains and on his or her overall clinical care. The average Mini-CEX encounter takes around 15 to 25 minutes. Immediate feedback is then given, which helps identify strengths and weaknesses and improve skills (Norcini, 2003).

How is it used? As part of a programme of WPBA, the Mini-CEX should be performed on multiple occasions with different patients and different assessors. There have been several studies in different clinical specialties looking at the optimum number of Mini-CEX encounters to reliably assess performance. Although there is good evidence of its reliability, most studies have looked at use of the Mini-CEX in experimental rather than real-life settings. This makes it possible for one performance to

be assessed by multiple assessors, something that is not practical in real clinical settings. In general, between 10 and 14 encounters over time are needed to show good reliability, if assessed by different assessors and on multiple patients (Boursicot et al., 2011). However, the number of encounters possible in real clinical practice settings needs to be balanced against the need for reliability.

Strengths and weaknesses: High satisfaction rates have been reported by both assessors and assesses. The perceived educational impact of the Mini-CEX is high because of its ability to provide opportunities for structured feedback, giving practitioners the potential to correct their weaknesses and develop as professionals (Weller et al., 2009). Increasing the interaction between junior and senior doctors may also enable monitoring of progress and identification of educational needs.



"Feedback can change physicians' clinical performance when provided systematically over multiple years by an authoritative, credible source."

Veloski et al. (2006)

The Mini-CEX appears able to discriminate effectively between junior and senior trainees, with more senior doctors attaining higher clinical and global competence scores (Norcini et al., 1995). In addition, it is relatively feasible within the workplace, being centred on real patients and clinical encounters. However, scheduling a Mini-CEX does require commitment by both the trainee and the senior doctor. Time constraints and lack of motivation in busy clinical settings may make completing assessments difficult and stressful. The reported interrater reliability of the Mini-CEX is variable, even among same assessor groups. There is also variation in scoring across different grades of assessor, with studies showing that trainees tend to score Mini-CEX encounters more leniently than consultants (Kogan et al., 2003). Interrater variations can be reduced, with more assessors rating fewer encounters, rather than few assessors rating multiple encounters. Formal assessor training may also help, but the evidence for this is variable, with some studies showing that training makes very little difference to scoring consistency and others reporting more stringent marking and greater confidence following assessor training (Boursicot et al., 2011). Finally, the purpose of the Mini-CEX within a programme of WPBA needs to be clarified. If the goal of the programme is to demonstrate satisfactory progress only, then fewer encounters will be needed. However, if the goal is to discriminate sufficiently between trainees to allow ranking, then a greater number of encounters is required, limiting feasibility.

Case-based discussion or chart-stimulated recall

What is it? The case-based discussion (CBD) in the United Kingdom and Australasia, or chart-stimulated recall (CSR) in North America, is a structured interview in which practitioners discuss aspects of a case in which they have been involved to explore their underlying reasoning, decision making and ethical understanding. It can be used in a variety of settings, such as clinics, wards or assessment units, and different clinical

problems can be discussed. The practitioner selects suitable cases and gives his or her written records of these to the assessor in advance. It is expected that the practitioner will select cases of varying complexity. He or she then presents the case to the assessor, who asks questions to probe his or her clinical reasoning and professional judgement. The practitioner is scored in a number of domains, mapped to the competencies expected within the programme of training. A CBD will usually take around 15 to 20 minutes for presentation and discussion with 5 to 10 minutes afterwards for feedback ([Davies et al., 2009](#)).

How is it used? As with other WPBA tools, repeated encounters are required to obtain a valid picture of a practitioner's level of development. Again, though, this has to be balanced with the practicalities of a busy clinical setting. The Royal College of General Practitioners in the United Kingdom asks trainees to complete a minimum of six CBDs in each of the first 2 years of training and 12 in the final year, but other Royal Colleges require different numbers. There are data available for the CSR which show good reliability. A comparison with different assessment methods has shown that assessment carried out using the CSR is able to differentiate between doctors in good standing and those identified as poorly performing ([Boursicot et al., 2011](#)).

Strengths and weaknesses: As with all WPBAs, the evidence regarding the true costs of the CBD is scarce. Direct costs include training of all assessors and central administration of WPBA records, but there are also costs associated with assessor and practitioner time in theatres, clinics and wards. There is also little published research on the educational impact of the CBD. However, as with other WPBAs, the opportunity for specific and timely feedback is thought to be valuable in helping learners progress.

Direct observation of procedural skills

What is it? Direct observation of procedural skills (DOPS) is a method of assessment developed by the Royal College of Physicians in the United Kingdom specifically for assessing practical skills. The practitioner is directly observed by an assessor while undertaking a procedure on a real patient. Specific components of the procedure are judged and then feedback is given after the event. The mean observation time for DOPS varies according to the procedure assessed and, on average, feedback time takes an additional third of the procedure observation time ([Wilkinson et al., 1998](#)).

How is it used? Many of the UK Royal Colleges now incorporate DOPS into their programmes of WPBA. Some use a generic score sheet, looking at overall aspects of procedural skill, while others have developed specific score sheets related to the procedure under assessment. There is a wide variety of skills that can be assessed with DOPS, from simple procedures, such as venepuncture to more complex procedures, such as endoscopy. Again, organizations vary in their expectations of trainees and which type of procedures should be assessed and how often.

Strengths and weaknesses: Scores have been shown to increase between the first and second half of a training year, indicating validity ([Davies et al., 2009](#)). In surveys, the majority of practitioners feel that DOPS is a fair method of assessing procedural skills and that it is practical and feasible ([Wilkinson et al., 1998](#)). There is little current research on the educational impact of DOPS, but again the opportunity for feedback

gives it important potential as an educational tool.



Tip

As with the Mini-CEX and CBD/CSR, DOPS needs to be repeated on several occasions for it to be a reliable measure of performance.

Multisource feedback

What is it? The goal of multisource feedback (MSF), or 360-degree assessment, is to collect the structured judgements of those who work with, or have experience of, the practitioner and feed these back in a systematic way, building up a picture of individual practice. Judges can include both senior and junior colleagues, nurses, administrative staff, medical students and patients, depending on the tool used. All judges remain anonymous, and their scores and comments are fed back to the trainee. Comparable assessment tools have been used in industry for nearly 50 years.

How is it used? Two similar instruments have been used in the United Kingdom to evaluate doctors in training. The Sheffield Peer Review Assessment Tool (SPRAT) was validated in paediatric trainees ([Archer et al., 2005](#)). The mini peer assessment tool (mini-PAT) was developed for more junior doctors based on the SPRAT and has been used by the UK Foundation School. The aim of the mini-PAT is to assess behaviours and attitudes, such as communication, leadership, team working and reliability ([Archer et al., 2008](#)). It is these sorts of attributes that are often best judged by multisource feedback tools. The mini-PAT is primarily meant as a formative form of assessment, allowing the doctor to reflect on the feedback received to improve his or her clinical performance.

Strengths and weaknesses: One of the main advantages of MSF is its anonymity, encouraging honest opinions. The main criticisms are that feedback is delayed and lacking specificity because of the anonymous nature. Interrater variance has been reported, with consultants tending to give lower scores. However, the longer the consultants have known the doctor, the more likely they are to score them higher. Senior doctors achieve a small but statistically significant higher overall mean score compared with more junior doctors, demonstrating construct validity ([Locke et al., 2003](#)). There are potential disadvantages to MSF tools as well, including risk of discrimination and potentially damaging feedback, which may need to be managed. However, MSF can be used as part of a programme of WPBA to inform personal development, especially regarding professional and interpersonal skills.



Tip

To be of the most value, assessments within the workplace should capitalize on the rich

diversity of clinical practice and build up an authentic picture of the practitioner over time.

Outstanding issues in performance assessment



“Workplace-based assessment brings a unique set of challenges to medical education and requires fresh thinking about how we consider and construct assessment programmes.”

Swanwick and Chana (2009)

WBA tools are now well described in many different areas of medicine, and a number of institutions make use of these in their programmes of assessment. However, a number of issues remain poorly resolved, and there continues to be some resistance amongst practicing clinicians to their use. Although the goal of WBA is to assess what a clinician does in practice, formalizing practitioner observation in a structured way does have the effect of reducing practice to the ‘shows how’ level of Miller’s pyramid and may not reflect real life. This, to some extent, seems unavoidable, but as WBA becomes more integrated into clinical life this effect may be diminished. However, there is still work to be done on how to incorporate the practice of WBA into busy clinical environments with minimal disruption and maximum benefit and ensure its acceptability to all stakeholders. While most of the research on reliability and validity of WBA has been done in experimental settings, it remains difficult to determine how it is best used in real-life settings, in different grades and different clinical specialties.



Tip

Institutions need to be clear about the purpose of their programmes of WBA: are they purely for formative purposes, or will the results be used to guide progression? Is their goal to ensure the ‘bare minimum’ level of performance, or are they being used to rank trainees? Without clarity from institutions, both trainees and trainers will feel confusion.

Research so far has been focused on the use of WBA as formative rather than summative tools, although it is not always clear that this is how they are being used in practice. There is some evidence that trainees are finding the culture shift in assessment hard to adapt to. There is an expectation that all WBAs should be clearly ‘passed’ from the start, rather than using them to demonstrate competency progression over time. This can lead to trainees fitting all their assessments into the end of a placement rather than using the assessment and its accompanying feedback as a tool to facilitate improvement over the course of a placement. What is clear is that different institutions have taken the basic frameworks described in the literature and adapted them significantly, using WPBAs summatively rather than formatively, as they were

originally intended. There is a growing movement in the medical education world to use WBAs without numerical or grading scales so the main focus is on performance and feedback rather than any summative or other purpose ([Ginsburg et al., 2015](#); [Govaerts & van der Vleuten, 2013](#); [Kirby et al., 2016](#)).

Although all the tools described earlier are widely used in postgraduate assessment around the world, their use is becoming more widespread in the undergraduate arena. The issues here remain largely the same, with a need for clarity of purpose and use of a battery of tools over time to build up a holistic picture of the student's strengths, weaknesses and progression.

Summary

The valid and reliable assessment of performance requires the use of a number of different assessment methods, each with its own strengths and weaknesses, which enable a complete picture of the practitioner to be developed. This is becoming increasingly important in a world where professionals are required to demonstrate competence. In undergraduate and postgraduate academic settings, the OSCE is a well-validated method that is widely used in high-stakes, summative assessments for licensing and progression. In the workplace, a number of instruments have been developed which offer insight into different aspects of clinical performance. To maximize the educational potential of these tools for learners and guide professional development, the focus should remain on supervised learning and timely, specific and constructive formative feedback, rather than summative scoring. Institutions need to consider their assessment strategies and goals and make the best use of the different methods available, in order that educators can be trained and guided in their use.

References

- Archer et al., 2005 Archer J, Norcini J, Davies H. Use of SPRAT for peer review of paediatricians in training. *British Medical Journal*. 2005;330(7502):1251–1253.
- Archer et al., 2008 Archer J, Norcini J, Southgate L, et al. Mini PAT: A valid component of a national assessment programme in the UK?. *Advances in Health Sciences Education*. 2008;13(2):181–192.
- Boursicot et al., 2011 Boursicot K, Etheridge L, Setna Z, et al. Performance in assessment: consensus statement and recommendations from the Ottawa conference. *Medical Teacher*. 2011;33:370–383.
- Davies et al., 2009 Davies H, Archer J, Southgate L, Norcini J. Initial evaluation of the first year of the Foundation Assessment Programme. *Medical Education*. 2009;43:74–81.
- Downing, 2003 Downing S. Validity: on the meaningful interpretation of assessment data. *Medical Education*. 2003;37(9):830–837.
- Ginsburg et al., 2015 Ginsburg S, Regehr G, Lingard L, Eva KW. Reading between the lines: faculty interpretations of narrative evaluation comments. *Medical Education*. 2015;49:3.
- Gleeson, 1997 Gleeson F. Assessment of clinical competence using the objective structured long examination record (OSLER). *Medical Teacher*. 1997;19:7–14.
- Govaerts and van der Vleuten, 2013 Govaerts M, van der Vleuten C. Validity in work-based assessment: expanding our horizons. *Medical Education*. 2013;47:1164–1174.
- Harden and Gleeson, 1979 Harden R, Gleeson F. Assessment of clinical competence using an objective structured clinical examination (OSCE). *Medical Education*. 1979;13(1):39–54.
- Hodges et al., 1999 Hodges B, Regehr G, McNaughton N, et al. OSCE checklists do not capture increasing levels of expertise. *Academic Medicine*. 1999;74(10):1129–1134.
- Kirby et al., 2016 Kirby J, Archibeque L, Confer L, Baird D. Workplace formative assessment: faculty members' beliefs. *The Clinical Teacher*. 2016;13:1.
- Kogan et al., 2003 Kogan J, Bellini L, Shea J. Feasibility, reliability, and validity of the mini-clinical evaluation exercise (mCEX) in a medicine core clerkship. *Academic Medicine*. 2003;78(10):33–35.
- Lockyer, 2003 Lockyer J. Multisource feedback in the assessment of

- physician competencies. *Continuing Education in the Health Professions*. 2003;23(1):4–12.
- Miller, 1990 Miller GE. The assessment of clinical skills/competence/performance. *Academic Medicine*. 1990;65(suppl 9):S63–S67.
- Newble, 2004 Newble D. Techniques for measuring clinical competence: objective structured clinical examinations. *Medical Education*. 2004;38(2):199–203.
- Norcini, 2003 Norcini J. Work based assessment. *British Medical Journal*. 2003;326(5):753–755.
- Norcini et al., 1995 Norcini J, Blank L, Arnold G, Kimball H. The mini-CEX (clinical evaluation exercise): a preliminary investigation. *Annals of Internal Medicine*. 1995;123(10):795–799.
- Norcini and Burch, 2007 Norcini J, Burch V. Workplace-based assessment as an educational tool: AMEE Guide No 31. *Medical Teacher*. 2007;29:855–871.
- Swanwick and Chana, 2009 Swanwick T, Chana N. Workplace based assessment. *British journal of Hospital Medicine*. 2009;70(5):290–293.
- Veloski et al., 2006 Veloski J, Boex J, Grasberger M, et al. Systematic review of the literature on assessment, feedback and physicians clinical performance: BEME Guide No 7. *Medical Teacher*. 2006;28(2):117–128.
- Weller et al., 2009 Weller J, Jolly B, Misur M, et al. Mini-clinical evaluation exercise in anaesthesia training. *British Journal of Anaesthesia*. 2009;102(5):633–641.
- Wilkinson et al., 1998 Wilkinson J, Crossley J, Wragg A, et al. Implementing workplace-based assessment across the medical specialties in the United Kingdom. *Medical Education*. 1998;42(4):364–373.

Portfolios, Projects and Theses

Erik W Driessen, Sylvia Heeneman and Cees van der Vleuten

Trends

- Electronic portfolios are used to aggregate assessment information
- Portfolios are essential in programmatic assessment
- A qualitative approach works well for the assessment of complex constructs (portfolios, thesis, projects)

Key concepts

- Portfolios: instruments to promote or assesses learning. Compiled by learners themselves, containing evidence of how (learning) goals were met and competence progressed. Often they include students' self-assessments and plans for improving competence ([Driessen et al., 2008](#))
- A qualitative assessment approach: a holistic approach for assessment based on the methodology of qualitative research in which different kinds of assessment, feedback and other information are aggregated and judged by one or more assessors.
- Mentoring: a form of one on one teaching in which one person (mentor) provides support to the learning and development to the other person (mentee)

Thesis circle: a thesis circle is composed of a number of students and one or two supervising teachers. During a period of time, students and teachers discuss and give feedback on the thesis. The thesis circle is jointly responsible for the supervision and assessment of the theses of the students participating in the circle.

Introduction

The assessment principles and strategies we will describe in this chapter not only apply to portfolios but have broader applications. They can also be used for other complex assessments, such as assessment of projects or papers, or a master's thesis.

The objectives and contents of portfolios

Portfolios have gained a prominent position in medical education. The portfolio owes its popularity to its suitability for attaining goals that are difficult to achieve with other educational methods: monitoring and assessing competency development and nontechnical skills, such as reflection. In this way, the portfolio is in keeping with recent developments in education, such as competency-based learning. Learners, residents, doctors and teachers are regularly asked to compose a portfolio. The objective of the portfolio, and consequently its format and content, can vary markedly. We distinguish the following main objectives for portfolios:

- Guiding the development of competencies. The learner is asked to include in the portfolio a critical reflection on his or her learning and performance. The minimal requirement for this type of portfolio is the inclusion of reflective texts and self-analyses.
- Monitoring progress. The minimum requirement for this type of portfolio is that it must contain overviews of what the learner has done or learned. This may be the numbers of different types of patients seen during a clerkship or the competencies achieved during a defined period.
- Assessment of competency development. The portfolio provides evidence of how certain competencies are developing and which level of competency has been achieved. Learners often also include an analysis of essential aspects of their competency development and indicate in which areas more work is required. This type of portfolio contains evidential materials to substantiate the level that is achieved.

Most portfolios are aimed at a combination of goals and therefore comprise a variety of evidence, overviews and reflections (Fig. 36.1). Portfolios thus differ in objectives, and the objectives determine which component of the portfolio content is emphasized. Portfolios can also differ in scope and structure. Portfolios can be wide or narrow in scope. A limited scope is appropriate for portfolios aimed at illustrating the learner's development in a single skill or competency domain or in one curricular component. An example is a portfolio for communication skills of undergraduate students. A portfolio with a broad scope is aimed at demonstrating the learner's development across all skills and competency domains over a prolonged period of education. Portfolios also differ in the degree of structuring or guidance that is provided to the learner in composing the portfolio. This dimension is characterized by the contrast between an open and a closed portfolio. A closed portfolio has to comply with detailed guidelines and regulations and offers relatively little freedom to learners with respect to the format and content of the portfolio. As a consequence, portfolios of different learners are highly comparable, and the portfolios are easy to navigate.

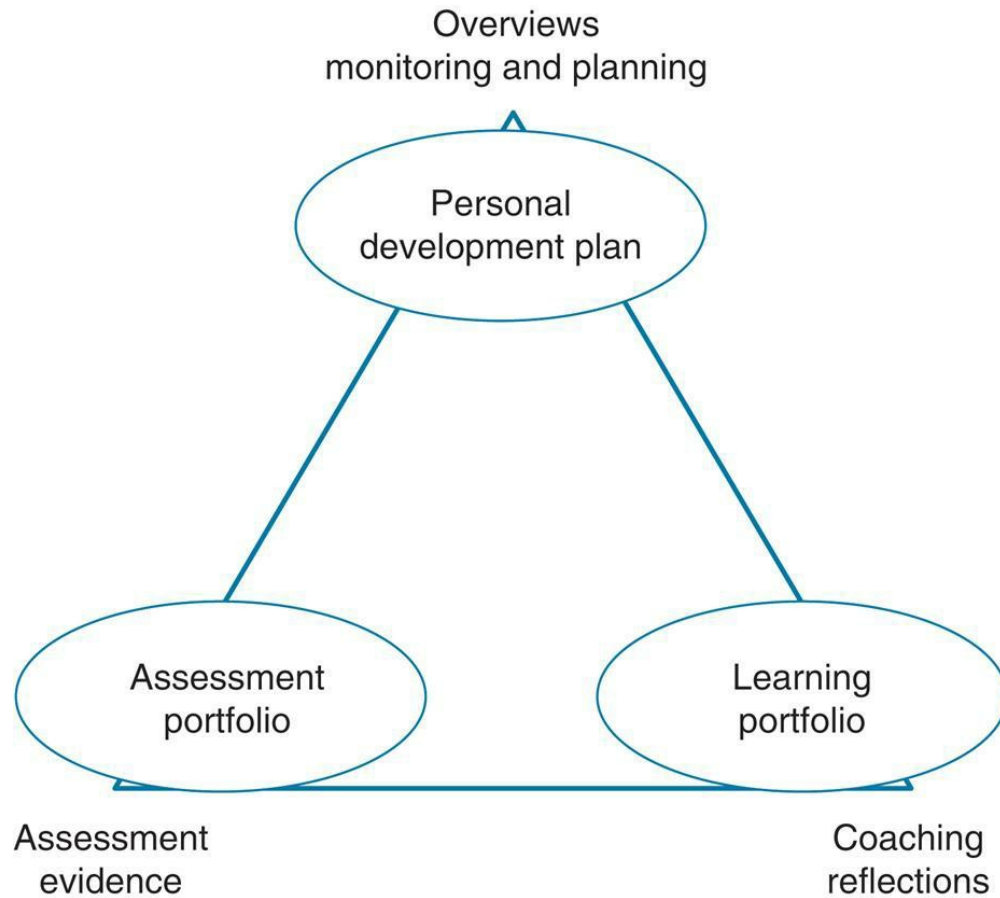


FIG. 36.1 Purpose and content of portfolios.

Portfolios with an open structure allow learners the opportunity to display their individual learning trajectories and competencies.

A more open portfolio gives general directions but allows the learners freedom with respect to the actual contents and format of the portfolio. The framework is described in such a way that learners are given a choice about how they present their individual learning process and learning results. A uniform basic structure is nevertheless important because teachers and peers who have to view several portfolios should be able to easily follow the general structure of the materials. An advantage of an open portfolio is that it offers learners the opportunity to reveal their individual learning trajectories and competency development.



Tip

Portfolios with a closed structure are highly comparable while portfolios with an open structure allow learners the opportunity to display their individual learning trajectories and competencies.

We have explained that portfolios can contain overviews, evidential materials and reflection. We have located these elements on the corners of a triangle (see [Fig. 36.1](#)). Portfolios can contain a variety of materials:

- Products, such as reports, papers, patient management plans, letter of discharge, critical appraisals of a topic
- Impressions, such as photographs, videos, observation reports
- Evaluations, such as test scores, feedback forms (e.g., mini-clinical evaluation exercise (mini-CEX)), feedback from peers and tutors, letters from patients expressing appreciation, certificates.

The nature and diversity of the materials determine the richness of the picture learners present of their learning and progress. It can be tempting for learners to include a vast amount of materials, leaving it up to the assessor to determine their value. This not only increases the mentors' and assessors' workload, but also can mean that mentor and assessors are unable to see the wood for the trees. It is therefore important for learners to be selective. A good selection criterion is that materials should provide insight into the student's learning and progress. We will discuss the size and feasibility of portfolios later in this chapter.



Tip

Learners can use captions to indicate the context in which the material was collected or produced, its relevance and why it was included.

Reflections

Many portfolios contain reflections. These are often organized around the competency framework. Learners can use these reflections as a long-term agenda. Learners support their reflections by referring to materials and overviews in the portfolio. This is important not only to convince others of the validity of the reflections, but also to focus the reflections, because learners are likely to aim for consistency of reflections and evidential materials. This makes the reflections less noncommittal. It is, for instance, not acceptable for learners to simply state that they have learned how to give a clinical presentation. They will have to substantiate this statement by evidential materials and overviews demonstrating why and how they have done this.

Electronic portfolios

Most schools use an electronic portfolio (e-portfolio). The e-portfolio can serve three functions: (1) provide a repository for all the materials (dossier); (2) facilitate the administrative and logistical aspects of the assessment process (i.e., direct online loading of assessment and feedback forms via multiple platforms, regulation of who has

access to which information and by connecting information pieces to the overarching framework); and (3) enable a quick overview of aggregated information (such as overall feedback reports). User friendliness is vital. The (e-)portfolio should be easily accessible to whatever stakeholder has access to it.

Success factors for portfolios



Tip

Mentoring is of the essence for portfolio use.

Despite the simplicity of the portfolio concept – a learner documents the process and results of his or her learning activities – the portfolio has proved to be not invariably and automatically effective. The literature on portfolios shows mixed results. The key question here is what makes a portfolio successful in one situation and less successful in another situation? A number of reviews have shed light on some key factors ([Buckley et al., 2009](#); [Driessen et al., 2007](#); [Tochel et al., 2009](#)).

Mentoring

Mentoring is of the essence for portfolio use. The mentor gives feedback on the portfolio, ensures depth of learning and helps the learner to identify learning needs and formulate learning objectives. Learners tend to stop working on their portfolio when they receive no feedback or when they are not questioned about their analyses. The mentor will be in most cases a teacher but can also be a peer. Mentoring can take place in one-on-one meetings or in mentor groups. It is important that mentors are prepared for their task. Mentoring requires a coaching approach, which is different from the approach customarily taken by teachers when they are teaching and/or supervising patient contacts.

Feasibility

Feasibility should also be considered. Learners and teachers can easily come to see work on the portfolio as burdensome paperwork. Portfolios can be sizeable, and the work for portfolios often comes on top of other tasks. Excessive workload can be prevented by a number of simple precautions. Firstly, learners should be stimulated to be selective in including materials in their portfolio. Portfolio content is only informative if it is relevant to learning and competency development. This requires that it is clearly explained to learners what is expected from them. The competencies to be achieved, the criteria, the content and purpose of the portfolio must be clearly communicated to both learners and teachers. Modern electronic portfolios sometimes aggregate information from the portfolio to the different competencies, giving users a quick overview of competency development. One mouse click suffices to view the original materials.

Perceived usefulness

The learner must experience direct benefit from working on the portfolio. When self-direction is required in a programme, the usefulness of the portfolio will be self-evident to learners. Residents, for instance, are largely responsible for their own learning in the clinical workplace. Using the portfolio as a starting point for discussing their work and progress can support that learning. Residents can ask for feedback and arrange for more time to be scheduled for matters that are relevant to their learning. This will motivate them to work on their portfolio. If little self-direction is required, for instance, when the programme consists of lectures and working groups, learners can only too easily come to the conclusion that the portfolio is of little real use to them.

Perceived usefulness also depends on how well the portfolio is embedded in the overall programme. If the portfolio is an integral part of the curriculum and is purposefully used for learning, it will have more value in the eyes of the learners than when it is just another educational activity. A final factor that can contribute to the educational value of the portfolio is the degree to which it accommodates differences between learners. When learners can present their individual profiles in the portfolio, they are more likely to value its usefulness.



Tip

Learners must experience direct benefit from working on their portfolio.

Portfolio assessment

If there is one area in which the portfolio has shown remarkable development in the past years, it is in the way it is assessed. The traditional, psychometric approach to assessment, characterized by standardization and analytical assessment criteria to achieve objective judgements, has proved incompatible with the nonstandardized nature of portfolios. Content and format of portfolios vary with the learners, and this runs counter to standardization.

In addition to numerical information (scores), portfolios also contain a variety of qualitative information. Besides technical skills, portfolios are used to assess the softer skills. Weighing the information in a portfolio to assess a competency, such as professionalism, demands of assessors that they use their own judgement to interpret the information. This kind of judgement task is difficult to translate to an analytical assessment procedure using a standardized checklist with numerous strictly defined criteria.

To match assessment with the characteristics of the portfolio, we advocate an approach based on the methodology of qualitative research ([Driessen et al., 2005](#)). Qualitative research also requires interpretation of different kinds of qualitative information to arrive at meaningful statements about ill-defined problems.

The concept of trustworthiness is at the centre of qualitative research: various procedural measures can ensure that the research is sufficiently rigorous to justify confidence that the conclusions are supported by the data. The principles and methods for evaluating the quality of qualitative research can be translated to principles and procedures for assessing portfolios ([Driessen et al., 2005](#)). The following assessment strategies can be used with portfolios.

Incorporate feedback cycles

Incorporate in the procedure intermittent feedback cycles to ensure that the final judgement does not come as a surprise to the learners. Because the contents of a portfolio are usually collected over a longer period of time, it is inadvisable to wait until the end of the period to make pronouncements about the quality of the portfolio. Intermediate formative assessments, such as feedback from a mentor, allow learners to adapt and improve their portfolio. Not only from an assessment perspective but also from a mentoring perspective, is it advisable to give feedback at various stages of the portfolio. As we remarked earlier, users will be tempted to stop working on their portfolio if they do not receive feedback.



Tip

Incorporate intermittent feedback cycles to ensure that the final judgement does not

come as a surprise to the learners.

Obtain multiple sources of feedback

Information for the assessment should be obtained from different people who are involved in the portfolio process one way or another. In addition to the assessors who judge the portfolio at the end of the period, others can be involved in the assessment as well. This enables triangulation of different judgements for the final assessment. We already mentioned that a portfolio is usually the result of work done over a longer period of time. In fact, the portfolio is not just a finished product (a file or web page containing materials) but it is first and foremost a process during which learners document their development over a (prolonged) period of time.

Different people who are involved in the portfolio process can also contribute to the assessment. It is the mentor who first advises about the quality of the portfolio. He or she often knows the learner best, is able to determine the authenticity of the materials and is familiar with the learner's work habits. Peers are another group that can be involved in the assessment. The advantage of peer assessment is that peers know from experience what it means to produce a portfolio, and by engaging in peer assessment they can familiarize themselves with the assessment standards for the portfolio.

Learners can also be asked to judge the quality of their own portfolios. They could, for instance, be asked for their reaction to the mentor's recommendation and/or to self-assess their different competencies. Self-assessment by learners supported by recommendations from the mentor can lead to better validated self-assessments. From the self-assessment literature, we know that self-assessments tend to be biased. Eva and Regehr therefore recommended that learners should be encouraged to actively seek information about their performance to arrive at well-validated self-assessments ([Eva & Regehr, 2008](#)).

Separate the role of the mentor and assessor

Separate the multiple roles of assessors by removing the summative assessment decisions from the coaching task. In relation to the previous item, we argued the wisdom of involving the mentors in portfolio assessment, because they possess relevant information. However, learners should also have a safe learning climate in which they feel free to discuss the weaknesses of their portfolio with their mentor. It is therefore advisable that mentors should not be required to make the final summative decisions. Such decisions should be the responsibility of a separate assessment committee. In an earlier publication, we described four scenarios for the role of the mentor in assessment ([van Tartwijk & Driessen, 2009](#)). This role can range from full responsibility for assessment to a role that is strictly limited to coaching.

- The teacher is the most common assessment scenario in education. Just like most teachers in primary, secondary and higher education, mentors discuss their learners' performance and progress and assess their level of competence at the end of a course.

- **PhD supervisor.** In some scenarios the role of the mentors in the assessment procedure of portfolios is comparable to the role of the supervisors of PhD students. In many countries, formal assessment of theses/portfolios is the responsibility of a committee. Supervisors invite their peers to sit on the committee, of which they themselves are not a member. A negative assessment of the thesis/portfolio would harm their reputation among their peers. For this reason they are highly unlikely to invite their peers to sit on the committee unless they are convinced the portfolio meets the criteria. As a consequence, mentors and learners have a shared interest: to produce a thesis or portfolio that merits a positive judgement.
- **Driving instructor.** In this model the roles of the mentor and the assessor are strictly separated. The mentor/driving instructor coaches the learner in achieving the required competencies, which are shown in the portfolio. If the mentor thinks the learner is sufficiently competent, he or she invites an assessor from a professional body (e.g., the examiner from the Driver and Vehicle Licensing Agency) to assess the competencies of the learner. It is also possible for learners to take the initiative to approach the licensing agency themselves.
- **Coach.** In this model, the learners take the initiative. They can, for instance, ask a senior colleague to coach them until they have achieved the required level of competence. This scenario is appropriate, for instance, when a professional wants to obtain an additional qualification. The assessor would be someone from an external body.



Tip

Separate the multiple roles of assessors by removing the summative assessment decisions from the coaching task.

Train the assessors

Organize a meeting of the assessors (before the assessment round and at an intermediate stage of the portfolio period) in which they can calibrate their assessments and discuss the assessment procedure and its results. Assessing the vast amounts of very diverse information in portfolios hinges on professional judgement. Assessors use assessment criteria idiosyncratically. Judgement depends, for instance, on prior experience with assessment and individual notions and beliefs about education and the competencies to be judged. Organizing discussions between assessors can reduce differences between assessors. As a result of discussing a benchmark portfolio, assessors' interpretations of assessment criteria will tend to converge, and a joint understanding of the procedure to be followed can emerge. It is advisable to organize such discussions not only immediately before an assessment round but also at an intermediate stage of the portfolio period when assessors can compare their own portfolio judgements with those of their colleagues and discuss differences of

interpretation. After the final assessment the assessors can be given information about all the assessments to gain a better understanding of the entire process.

Use a sequential procedure

Organize a sequential assessment procedure in which conflicting information necessitates the gathering of more information. At Maastricht Medical School, a procedure has been developed to optimize efficient use of the time available for assessment ([Driessen et al., 2005](#)). The mentor makes a recommendation for the assessment of the portfolios of his or her students. The learner and an assessor decide whether they agree with this recommendation. If they agree, the assessment procedure is completed. If they do not agree, the portfolio is submitted to a larger group of assessors. In this way, when there is doubt about the assessment of a portfolio, the portfolio is judged more carefully than portfolios whose assessment is straightforward. This gives stronger guarantees of trustworthy assessment, because, in cases of doubt, more judges are consulted. The discussions between the assessors will also promote clarity with respect to the application of the criteria (see also under the heading training of assessors).

Request narrative information

Incorporate in the portfolio requests to provide qualitative, narrative feedback and give this information substantial weight in the assessment procedure. Narrative comments offer learners and judges much richer information than quantitative, numerical feedback. A score of 7 on a 10-point scale, for instance, gives little insight into what a learner has done well and what he or she has not done well. Only when strengths and weaknesses of performance are supported by narrative feedback does assessment become truly informative. An additional problem with workplace assessment is rater leniency. There are various reasons why low scores are rarely given in practice. As a result, scores do not discriminate well, and narrative feedback will often provide better information about the learner's competency development. Narrative feedback can be facilitated by providing a blank space at the top of the assessment form to insert descriptions of strengths and weaknesses.

Provide quality assurance

Quality assurance must be built into the procedure:

- Offer learners the possibility to appeal against assessment decisions.
- Carefully document the different steps of the assessment procedure (a formal assessment plan approved by an examination board, overviews of results).
- Organize quality assessment procedures with an external auditor.

Use milestones

Education institutions often put a great deal of energy into formulating competency profiles. The important thing is to strike a balance between long lists of concrete criteria detailing all the things a learner must be able to do (can-do statements) on the one hand, and global descriptions offering a general outline but little practical guidance on the other hand. In other words, the trick is to find the right balance between analytical and global criteria. This can be done by giving learners and assessors an idea of the expected level for each global competency. Milestones or rubrics are very useful in this respect (an example is given in [Table 36.1](#)). They typically contain descriptions of each competency at different levels, such as the level to be expected from a novice, from a competent professional and from an expert.

Table 36.1 Milestones used for the assessment of final-year medical students

| | Below expectation | As expected | Above expectation |
|--|--|--|--|
| Clinical performance (for instance as judged by Mini-CEX [clinical evaluation exercise]) | <p>Slow in taking a history and performing a physical examination. Considers irrelevant aspects.</p> <p>Slow in making a diagnosis. Misses important conclusions.</p> <p>Frequently unable to formulate management plan and needs considerable guidance.</p> | <p>Adequate speed in taking a history and performing a physical examination.</p> <p>Relevant aspects are considered.</p> <p>Adequate speed in making a diagnosis. Diagnosis contains important conclusions.</p> <p>Formulates an adequate management plan for simple clinical presentations.</p> <p>Needs some guidance.</p> <p>Achieves these goals in the second half of the internship.</p> | <p>Conducts an adequate and efficient history and physical examination.</p> <p>Arrives at an accurate diagnosis within adequate time.</p> <p>Formulates an adequate management plan for simple clinical presentations.</p> <p>Needs little guidance.</p> <p>Has achieved these goals at the start of the internship.</p> |
| Professionalism (for instance, as judged by 360-degree feedback) | <p>Does not keep appointments.</p> <p>Occasionally fails to ask for supervision when this is necessary. Reacts defensively to feedback.</p> <p>Is unable to cope with stress.</p> <p>Does not pay attention to his or her personal appearance.</p> <p>Frequently shows</p> | <p>Keeps appointments.</p> <p>Asks for supervision when this is necessary.</p> <p>Needs help in reflecting and considering alternatives and responds adequately to feedback.</p> <p>Occasionally needs help in coping with stress.</p> <p>Appropriate personal</p> | <p>Keeps appointments.</p> <p>Asks for supervision when this is necessary.</p> <p>Is able to reflect critically; responds adequately to feedback and is prepared to acknowledge errors.</p> <p>Is able to cope with stress adequately.</p> <p>Looks well cared for and behaves respectfully.</p> |

| | | | |
|--|---|--------------------------------------|--|
| | inappropriate behaviour or behaves disrespectfully. | appearance; behaves respectfully. | |
|--|---|--------------------------------------|--|

(From Maastricht University.)

We will also pay attention to a method for organizing theses and project assessments named thesis circle.

Thesis and project circle

Writing a final thesis or dissertation, or a project report is in most cases an individual effort, supervised and assessed by one or two teachers. In most cases the student's learning is limited to his own work and the teacher's feedback. For curricula with a large number of students, teachers are faced each year with a large number of thesis writers, requiring considerable supervision time. In addition, the assessment of a thesis or dissertation is often related to a graduation decision and is used by the student to present oneself with future employees or subsequent education. The criteria for assessment need to be very explicit and the decision itself valid. More and more, an independent second assessor is used in the assessment procedure. To overcome the need for large teacher input and time, and to enable students to learn from each other, 'thesis circles' have been set up. A thesis circle is composed of a number of students and one or two supervising teachers. They are jointly responsible for the supervision and assessment of the theses of the students participating in the circle (Romme, 2003; Van der Vleuten & Driessen, 2000). Thesis circles get together on a regular basis. Their meetings are conducted according to a fixed pattern: an opening round, setting the agenda, discussion of the content of the theses and a final round. The circle is presided over by an elected chair and a secretary is responsible for minute taking.

The advantage for teachers is greater efficiency through an economy of scale with less reading time needed, because in the conceptual phase reading is divided among several participants, and with less supervision time, because the teacher meets with several students at the same time. Furthermore, the thesis circle aims to stimulate cooperative learning and reinforce the feedback function of assessment by stimulating reflection, cooperation and shared responsibility between students, on the one hand, and between students and teachers, on the other. As to content, discussion of the start and progress of the theses is paramount. The feedback by the members of the circle serves to support the thesis writers. Decisions are taken by consent: upon a grade proposal by the chairman, a decision is taken if none of the members (either students or teachers) has a reasoned objection. In this way, for instance, the chair is elected and the final assessment is given: the graduation circle uses therefore a method of assessment, which combines teacher assessment and peer assessment with self-assessment. A condition for ensuring a candid climate is a strict procedure on the basis of formal rules. Each graduation circle is therefore governed by a set of rules and regulations.

The role of supervisor and assessor requires the student to be independent. Experience with other forms of cooperative learning shows that students who are used to strong direction by the teacher, have trouble studying on their own. They may quickly get the feeling that they are thrown in at the deep end. It is advisable to prepare students by training them in skills needed for the thesis circle. Students who already have experience with self-direction, for example, in problem-based learning or other student-centred forms of education will feel more at home in a thesis circle.

Another condition for the proper functioning of a circle is that the teacher effectively shares responsibility for monitoring and assessment.

Summary

Portfolios serve different purposes in medical education. These purposes can be summarized as guiding, monitoring and assessing the development of students' competencies. Portfolios often combine several objectives. Apart from differences in objectives, portfolios also differ in scope: a brief versus a long education period, a limited competency domain versus a comprehensive competency profile and an open versus a closed structure. A portfolio is not automatically effective. A number of conditions must be met to ensure that a portfolio makes a meaningful contribution to the learning of students. Mentoring, feasibility and immediate benefits to learners are key factors for portfolio success. Assessing portfolios requires a different approach than is customarily used by most teachers. An approach based on principles from qualitative research is more appropriate than a psychometric one. A number of strategies to ensure rigour of assessment are described: incorporate feedback cycles in the procedure, involve mentor and learners in the assessment, separate the role of the mentor and the assessor, train assessors, use a sequential procedure, use narrative information, provide quality assurance and make use of rubrics. These strategies are also suited to other complex assessment situations, such as the assessment of projects and theses.

References

- [Buckley et al., 2009](#) Buckley S, Coleman J, Davison I, et al. The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review BEME Guide No 11. *Medical Teacher*. 2009;31:282–298.
- Driessen et al., 2005 Driessen E, van der Vleuten C, Schuwirth L, et al. The use of qualitative research criteria for portfolio assessment as an alternative to reliability evaluation: a case study. *Medical Education*. 2005;39:214–220.
- [Driessen et al., 2008](#) Driessen EW, van Tartwijk J, Dornan T. The self-critical doctor: helping students become more reflective. *British Medical Journal*. 2008;336(7648):827–830.
- [Driessen et al., 2007](#) Driessen E, van Tartwijk J, van der Vleuten C, Wass V. Portfolios in medical education: why do they meet with mixed success? A systematic review. *Medical Education*. 2007;41:1224–1233.
- [Eva and Regehr, 2008](#) Eva KW, Regehr G. “I’ll never play professional football” and other fallacies of self-assessment. *Journal of Continuing Education for Health Professionals*. 2008;28:14–19.
- [Romme, 2003](#) Romme S. Organizing education by drawing on organization studies. *Organization Studies*. 2003;24:697–720.
- [Tochel et al., 2009](#) Tochel C, Haig A, Hesketh A, et al. The effectiveness of portfolios for post-graduate assessment and education: BEME Guide No 12. *Medical Teacher*. 2009;31:299–318.
- [Van der Vleuten and Driessen, 2000](#) Van der Vleuten CPM, Driessen EW. *Assessment in problem-based learning (Toetsing in probleemgestuurd onderwijs)* Groningen: Wolters-Noordhoff; 2000.
- [van Tartwijk and Driessen 2009](#) van Tartwijk J, Driessen EW. Portfolios for assessment and learning: AMEE Guide no 45. *Medical Teacher*. 2009;31:790–801.

Feedback, Reflection and Coaching: Tools for Continuous Learning

Sharon K Krackov, Antoinette S Peters, Henry S Pohl and Joan M Sargeant

Trends

- Feedback, reflection and coaching are interconnected components of the learning process, embedded within complex cultures and environments.
- The four different levels of feedback are: task, process, self-regulation and self. Each should be used appropriately.
- Reflection fosters deeper understanding of the feedback
- Coaching enables learners to use feedback effectively by setting goals and developing action plans.

Key concepts

- Culture: comprised of behaviours, beliefs, characteristics, values, and common practices shared among members of a group or society.
- Feedback: a process, an ongoing bidirectional discussion contextually situated within a safe environment to examine and understand past performance and to plan means of growth.
- Reflection: 'the process of analysing, questioning, and reframing an experience to make an assessment of it for the purposes of learning and/or to improve practice.' ([Aronson, 2011](#)).
- Coaching: 'a one-to-one conversation focused on the enhancement of learning and development through increasing self-awareness and a sense of personal responsibility, where the coach facilitates the self-directed learning of the coachee through questioning, active listening, and appropriate challenge in a supportive and encouraging climate.' ([van Nieuwerburgh, 2012](#)).
- Mindset: a perspective on one's own learning. Learners attribute their success or failure based on native ability (fixed mindset) versus effort (growth mindset) ([Dweck, 2006](#)).

Introduction

In this chapter, we describe the pivotal and interconnected roles of feedback, reflection and coaching in promoting learning in medical education. Used together, they become powerful and impactful tools that can systematically enable learners to continually develop their knowledge, skills and behaviours and to grow as they strive to become competent healthcare providers. The process we outline for feedback, reflection and coaching is useful for brief formative teacher-learner interactions, as well as for reviewing learners' overall performance based on accumulated data from sources, such as a portfolio or other summative measures.

Just as learning in medical education is influenced by multiple factors, so too are feedback, reflection and coaching. These factors fall into three broad categories: (1) overall culture and environment; (2) educational programmes and curriculum, and (3) learner/teacher characteristics and experiences ([Fig. 37.1](#)). Importantly, organizational culture serves as the key contextual factor that impacts all phases of the learning process. An organization's culture is comprised of its norms, shared values and common practices ([Tierney, 2008](#)). The unique culture of both medical schools and hospitals is derived from the confluence of interdependent influences, relationships and practices among each of several component parts: hospitals and academic healthcare centres, departments and specialty units, specific curricular modules, and the values and experiences that faculty, learners and patients bring to the organization.

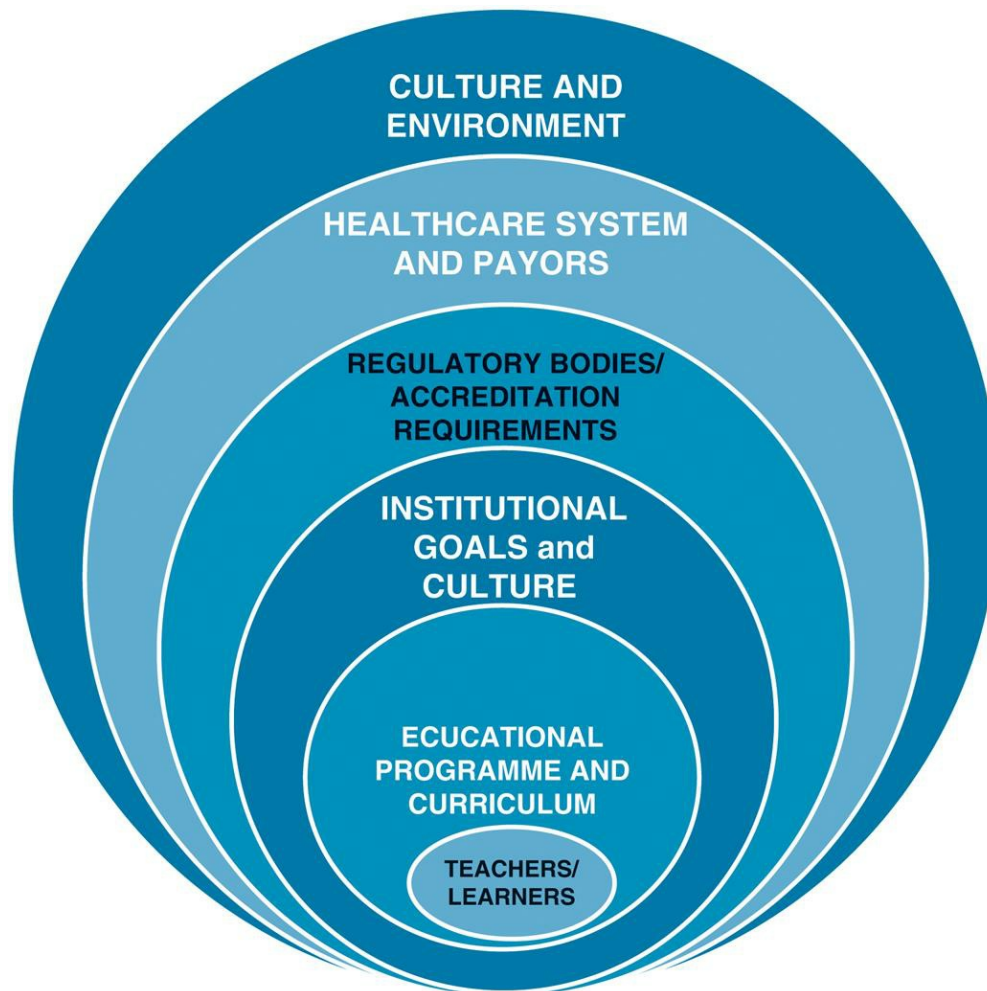


FIG. 37.1 The context of learning.

Currently, the culture in most clinical healthcare institutions, as well as academic affiliated schools and colleges, may still inhibit learning because of a focus on excellence which brings with it the implicit threat of the stigma of failure or being less than perfect. A positive learning culture features communication, openness, inquiry and feedback, plus adequate time to achieve specific outcomes, coupled with mutual respect and support amongst faculty and learners ([Senge, 1999](#)). Current researchers emphasize the importance of establishing a learning environment that emphasizes learning goals instead of performance, and that provides training in feedback, reflection and coaching, including strategies for giving, seeking, receiving and incorporating feedback ([Ramani et al., 2019](#); [Telio et al., 2016](#)). Such cultural practices and values enable learners to acquire the ability to identify their own learning goals and use feedback, reflection and coaching for continuous learning.

Changing characteristics of the healthcare system also impact the learning culture. Systems and structural changes (e.g., team-based care, a focus on quality improvement) are being implemented to enhance care, lower costs, and reduce errors. At the same time, incorporating these elements into the contextual framework in which experiential learning occurs has led many medical educators to establish competency-based

educational curricula within which learners can build proficiency. In this framework, learners can develop their skills to use feedback, reflection and coaching as the underpinnings for their professional growth, while achieving specific programme outcomes ([Krackov et al., 2017](#)).

Learners' development is dependent upon ongoing formative assessment, which includes observation of their knowledge, skills or performance and a feedback conversation based upon those observations to guide progress. The data gathered by the teacher (e.g., from portfolio assessment, stimulated chart review, examination results, or by observing learners performing clinical procedures or interacting with patients) provide the content for the feedback conversation and hence for learner development. In this light, being observed and assessed encourages more purposeful use of feedback from assessments to promote learning. By creating a safe environment in which errors are analysed openly and feedback is sought and welcomed amongst all (i.e., teachers, learners, staff), learning becomes an active, reflective and life-long activity supported by conversations that recognize the power and influence of the teacher-learner relationship ([Telio et al, 2016](#); [Watling et al., 2013](#)).

Using a feedback loop, such as that associated with quality improvement (plan, do, check/study, act cycle), can enhance learners' continuing development while subtly changing the institutional culture. It also establishes a deliberate practice model, described by Ericsson as 'individualized training activities specially designed by a coach or teacher to improve specific aspects of an individual's performance through repetition and successive refinement' ([Ericsson, 2015](#)). We propose that learners' commitment to continuous deliberate practice by engaging with teachers in feedback, reflection, and guidance through coaching is necessary to develop mastery, and eventually expertise.

The learning process we describe in this chapter begins with a systematic approach to feedback, followed by reflection and coaching.

Feedback



"...the principles of co-construction in the context of a meaningful relationship must apply for it to be called 'feedback.'"

Ajjawi and Regehr (2018)

Feedback has traditionally been defined as information provided to individuals about their performance with the goal of increasing their motivation and improving future performance. Customarily, it has been treated as a mechanistic, hierarchical and unidirectional activity: that is, teachers have given learners information using proscribed methods of communication; or, learners have gleaned information from a variety of sources, with or without faculty assistance (e.g., portfolios, examinations). Recent definitions of feedback ([Ajjawi & Regehr, 2018](#); [Krackov et al., 2017](#); [Ramani et al., 2019](#)) now conclude that feedback constitutes a process, an ongoing bidirectional discussion contextually situated within a safe environment to examine and understand past performance and to plan means of growth. As we explain later, this newer definition helps us understand how feedback functions to promote learning that results from the interaction of environment, educational experiences and personal characteristics.

Researchers and practitioners alike recognize that feedback often fails to elicit the desired outcome ([Watling et al., 2013](#)). To assure effectiveness of feedback conversations, we must attend to the following factors: (1) feedback method, (2) content of feedback, (3) environmental context (the learning environment, encapsulated within an organization's culture); and (4) personal characteristics: learners' and teachers' educational experiences with feedback and their personal styles and characteristics.

Feedback method

First, teachers and learners should jointly review course requirements to determine each learner's level of development, prior experiences, motivations and personal goals, and discuss learning objectives and outcome measures (e.g., what are their expectations? What are the objectives at this level?) ([Box 37.1](#)). This conversation will lay the foundation for a positive instructor-learner relationship, how they will give, seek, receive and use feedback, and will establish the value of feedback to learners' development.

Box 37.1

Feedback tips

1. Determine how the objectives link to learners' goals. "You will be evaluated on your ability to tie suture knots efficiently. I know you plan to be an internist, not a surgeon, so let's discuss how learning this skill impacts your role as an internist."
2. Train learners how to seek specific feedback with examples such as: "I am having difficulty differentiating murmurs. Would you have time to observe and instruct me on how to listen to murmurs and discuss their pathophysiology?"
3. Align information with agreed upon objectives. "When I gave you feedback on your use of secondary sources, you agreed to critically review primary research on tuberculosis. Your critical analysis of primary research as applied to your patient's management shows a deepening understanding of the challenges of this disease."

Many methods of giving feedback have been developed, most recently emphasizing the importance of the instructor-learner relationship ([Sargeant et al., 2018](#)). Most acknowledge that effective feedback includes trustworthy, nonjudgemental, first-hand, specific information, timeliness and a plan for improvement. Currently, there is also a trend to encourage learners to seek feedback ([Crommelinck & Anseel, 2013](#)). To do this, instructors can show learners how that interaction can be useful for their personal and professional development. They might explain that asking a general question ("How am I doing?") invites a general response, whereas asking for feedback on a specific act is more likely to lead to focused and helpful responses (see [Box 37.1](#)). In fact, such specific requests also help busy faculty focus their attention on specific learning activities. Over time, such feedback conversations will be woven seamlessly into the learning process, and learners' confidence in the instructor and feedback will grow. Feedback will feel less threatening, and learners should be able to identify their own growth as an outcome of feedback. As the value of feedback rises, so too may the value of honest self-assessment.

Content

Until recently, medical educators have focused their attention on feedback methods. Here we discuss how the levels of feedback content affect learning. [Hattie and Timperley \(2007\)](#) define four levels of feedback content; the first three affect learning in a positive manner, and the fourth does not.

1. Task. Feedback centred on the task indicates that the answer or performance was right or wrong; it reinforces desired behaviour and reduces mistakes. Such reinforcing or correcting information usually leads to improvement. However, this information does not foster transfer of learning; that is, applying previously learned knowledge or skill in new situations to facilitate learning or to solve problems.
2. Process. This involves feedback about how the learner prepared for a task, arrived at the right answer or mastered a skill, and is embedded in a richer, more memorable context than simple task-based, right versus wrong feedback. When feedback about the process of learning accompanies task-based feedback,

- deeper learning and transfer of learning is more likely to occur.
3. Self-regulation. Self-regulation is described as behaviours taken to attain a personal goal ([Brydges & Butler, 2012](#)). Examples include willingness to reflect, assess one's own limitations and ask for help; request and act upon feedback or coaching; set personal goals; show a commitment to learning. Through these activities, learners gain self-efficacy, develop skills in self-monitoring, and gain a sense of control over their own learning. Because self-regulation is key to achieving independence and reliability as a physician, it is critical that faculty provide guidance towards its development.
 4. Self. Feedback at the self-level refers to general criticism, praise and comments on personal characteristics. Feedback at this level does not promote learning, and often undermines it. For example, suggesting that learners succeeded or failed because of innate characteristics, such as intelligence, sets them up for a sense of frustration and a lack of control over their own learning; that is, when they fail to master a difficult task quickly, they are likely to feel that they were not born with the requisite skills for that task and are doomed to failure ([Dweck, 2006](#)).

We note one exception: although feedback that is general ("Good job!") lacks specificity and gives learners no information about what they should do next, it may help establish a good relationship between instructor and learner and lay the foundation for more specific and constructive feedback ([Ajjawi & Regehr, 2018](#)).

Although providing factual feedback on observed performance is usually straightforward, discussing learners' process and self-regulation skills can be challenging because these are more difficult to observe. In this case, instructors can focus on outcomes vis-à-vis a learning objective (see [Box 37.1](#)). Aligning the content of one's feedback with clear, shared objectives can reduce defensive behaviour and foster learners' ability to accept and learn from feedback. Fostering reflection upon feedback can also uncover learners' process and self-regulatory skills (see next section on reflection).

Environmental context for feedback

Medical education and clinical systems are typically hierarchical and value high achievement; therefore learners may avoid openly admitting error or weakness and seeking feedback. Moreover, medical schools that focus on a learning culture ([Senge, 1999](#)), as well as assessment 'for' — rather than 'of' — learning ([Ramani et al, 2019](#)), establish an environment in which it is safe to learn from mistakes, and feedback is both expected and desirable. Curricular structures like longitudinal clerkships ([Hauer et al., 2012](#)) and evidence-based feedback methods like the R2C2 model ([Sargeant et al., 2018](#)) can enhance learner-instructor relationships, and consequently enhance the amount and quality of feedback.

Educational experiences

Both learners and teachers rose through educational and popular cultures that

identified them as smart and fostered competitiveness and grade-seeking behaviour. Their educational experience was that the best and brightest were the ones who received recognition, awards and letters of recommendation to the best schools, jobs and so on. As a result, both learners and teachers perceived that outcomes, such as observed skills and test scores, constitute feedback. Combined with systems in which time is limited, such outcome-based feedback was frequently supplemented with hasty, generally positive comments that provided little or no guidance for growth (Bing-You et al., 2018). In addition, the culture of politeness and excellence has limited faculty's willingness to provide constructive feedback (Dudek et al., 2005; Ramani et al., 2019), further limiting learners' experience with receiving and learning from corrective feedback.

Personal characteristics

Learners bring to medical training a variety of characteristics and perspectives that either inhibit or enhance their learning. First, some learners tend to attribute their success to native ability and to fear that sooner or later they will be found lacking. Dweck (2006) described this as a *fixed mindset*, in which learners tend to view feedback as criticism, to fear and to resist it. Instead of seeking feedback, they seek praise (Watling et al., 2013). Contrary to this is a growth mindset through which learners perceive the relationship between effort and outcome and believe that they can achieve through hard work. They are more receptive to feedback, perceiving its value to achieving their goal.

Even well-given feedback may fail because feedback interacts with other factors, such as learners' resilience, motivation and openness to reflection and feedback. Resilience, a characteristic of a growth mindset, enables recovering from the disappointment of error or failure, and learning from the experience. In addition, learners' perception of the utility of the feedback depends on their interest in the subject and motivation to succeed, as well as their sense of self-efficacy in attaining their goals (Pekrun, 2006). If learners believe the learning objectives for the unit address their own learning goals and, ideally, seem useful to their career goals (Harackiewicz & Hulleman, 2010), they are likely to be motivated to work hard, to believe themselves capable of the work, and to find feedback helpful. Having learners reflect on the information received through feedback and having a coach help centre their response to feedback aimed at improving their performance, accustoms them to lifelong learning and improvement.

The effect of feedback on learners' development is dependent not only upon what and how information is provided, but also upon an interplay of personal, social, experiential and cultural factors. Thus programmes that facilitate the development of instructor-learner relationships might also promote the development of feedback practices that go beyond the 'task' level, and build skills along the continuum of feedback levels and, as we describe next, through reflection and coaching.

Reflection



"Reflection seemed to be the process through which feedback was or was not assimilated and appeared integral to decisions to accept and use the feedback."

Sargeant et al. (2008)

Although reflection is a commonly used concept, the term 'critical' reflection is more useful in education. Critical reflection is *"the process of analyzing, questioning, and reframing an experience to make an assessment of it for the purposes of learning and/or to improve practice"* (Aronson, 2011). It is central to learning from educational activities including feedback because it is through the process of analysing and questioning one's experiences that one learns from them. In this chapter for writing simplicity, we use the word reflection to include the definition of critical reflection.

Reflection is integral to feedback and learning for several reasons. First, feedback provided at the 'process' level (Hattie & Timperley, 2007) can guide the learner to reflect upon how they came to a conclusion or why they performed a procedure a certain way. Secondly, reflecting upon the feedback itself encourages learners to consider how it pertains to them and how they might use it for improvement. Thirdly, reflection on feedback can stimulate informed self-assessment; that is, stimulate critical thinking about how one has performed and about the new information that feedback provides about that performance (Sargeant et al., 2010). Finally, fostering reflection on feedback can promote the development of ongoing self-appraisal or self-monitoring skills. The latter two reasons in particular—to promote self-critique and ongoing self-monitoring—relate to Hattie and Timperley's self-regulation level of feedback, and the role that reflection on feedback at this level plays in fostering the self-analytical skills and mindset required for lifelong learning. (see Box 37.2 for sample questions to promote reflection at Hattie & Timperley's levels of feedback.)

Box 37.2

Key questions for reflection

To encourage reflection upon:

The **task**/knowledge/performance (i.e., right or wrong?)

1. What was your goal today in performing X?
2. What do you think you did well? What would you like to improve?

The **process** (how learned and performed)

3. How did you prepare for today's session?

4. Can you tell me what you were thinking when you were doing X?
5. What was your strategy in doing it?
6. I'm curious, when you decided to do Y, what was your intent?

To encourage **self-regulation** (goal setting/self-assessment/self-monitoring)

7. When you compare my observations to your self-assessment, where do we agree and where do we disagree?"
8. What might be some reasons for our differing opinions?
9. The purpose of feedback is to point out ways to improve. What would you now like to improve?
10. What have you learned from this process of reflecting on your feedback, that you could apply to future situations?

As noted earlier, multiple factors influence learners' acceptance and use of feedback. One approach to enhancing feedback use is encouraging learners to self-critique; that is, to reflect upon and critique their own performance in light of their understanding of the standard or competency level required, and then to reflect upon the feedback they have received and how it is similar or not to that of self-assessment. Such reflection stimulates learners' understanding of their performance and engagement in their feedback, providing instructors with the opportunity to discuss the feedback and share their rationale for it. The latter is especially important if feedback disconfirms learners' self-assessments of how they are doing and leads to defensive reactions ([Sargeant et al., 2010](#)).

Over a period of time, multiple sources of feedback and information, and discussion of these with instructors, can heighten learners' awareness of their strengths and weaknesses vis-à-vis a standard. Both the accumulation of evidence and the discussion add to the learners' perceptions of the trustworthiness of the data and make them more difficult to dismiss on the grounds of instructors' bias. Such accumulated evidence also helps learners calibrate their own performance and become more accurate self-monitors. In turn, being willing to reflect upon and assess one's own performance leads not only to greater openness to feedback but a sense of control over one's learning that makes feedback seem desirable and useful.

Reflection is generally more effective as a facilitated or guided activity, rather than as a solo activity ([Sargeant et al., 2008](#)). An instructor facilitating a learner's reflective process using guiding, open questions can steer the learner towards an objective and specific critique of their performance and feedback received. Encouraging reflection engages both the cognitive and affective capacities of learners. Reflecting on one's emotional reactions to a situation or feedback is equally important for learning as is reflecting upon the data or facts. For learners, encouraging reflection upon their performance and feedback can enable understanding, assimilation and ownership of their progress. Sample questions to enable reflection upon one's performance and feedback appear in [Box 37.2](#).

Like other skills, those needed for critical reflection, informed self-assessment and ongoing self-monitoring can be taught and fostered. Routinely using open-ended

questions promotes the learners' immediate reflection upon the learning activity at hand, how they think they are doing, and how they can improve. Questions can also direct the learners' attention to how this learning fits with overall programme outcomes and personal goals for development.

The role of the supervisor is also to create a safe learning environment where honest reflection and self-critique are valued. Asking open-ended questions in a sincere, nonjudgemental and respectful manner contributes to the creation of such a culture. These approaches enable an open conversation with learners about how they think they are doing and how their feedback fits, or does not fit, with their own self-assessments. The honest conversation leads to learners' greater understanding of their progress and learning needs. It can also help allay learners' concerns about their feedback, especially for those who may not be doing as well as they thought or who are struggling. Although learners who fit this description may react defensively to feedback that conveys a negative message, having a reflective, learner-centred conversation about their views, emotional reactions, and concerns or doubts can actually reduce defensive reactions ([Ramani et al., 2019](#); [Sargeant et al., 2018](#)).

Faculty can also explicitly act as role models and foster the establishment of a learning culture by demonstrating for learners how they purposefully reflect upon and monitor their own practice and learning and respond to feedback. They can do this by 'thinking out loud' about what they are doing, how they are feeling about it, and importantly by revealing feedback they have received (e.g., students' evaluations, patient outcome data) and how they managed their emotional reactions to it. Through this, they demonstrate their use of such personal reflections to improve their practice or guide learning.

Whereas reflection promotes learning from feedback, facilitating learners' reflection upon their goals and action plans arising from that feedback is equally important for coaching and engaging learners in their continual learning and progression.

Coaching



“Coaching requires a shift in philosophy. It isn’t about the finite exercise of teaching something to someone, but rather about the infinite exercise of continuous improvement.”

Watling (2017)

Coaching focuses on how one can use feedback to improve, progress to meet goals and become the best that one can be. Although feedback provides information about what can be corrected and improved, coaching promotes a positive growth mindset and uses feedback to direct attention to how learners can continually improve and progress, from novice to competent to expert ([van Nieuwerburgh, 2012](#)). The image of sports or music coaching is helpful because the essence is helping individuals to get better.

Coaching in education is defined as *“a one-to-one conversation focused on the enhancement of learning and development through increasing self-awareness and a sense of personal responsibility, where the coach facilitates the self-directed learning of the coachee through questioning, active listening, and appropriate challenge in a supportive and encouraging climate”* ([van Nieuwerburgh, 2012](#)). Coaching is a partnership with the learner, one that is based on mutual respect. It is neither judgemental nor based on assumptions; like sports coaching it requires observation of learners to collect data about their performance. Supervisors engage learners in reflective conversations about those specific observations and feedback to enhance insight and then create an action plan, to help learners progress to a higher level.

A model used extensively in feedback and coaching conversations in medical education is the evidence-based R2C2 ([Sargeant et al., 2018](#)). It includes four iterative phases: relationship, reaction, content and coaching, and asks open questions during each phase to promote learner reflection. The goal of each phase is to: (1) build a respectful, trusting relationship; (2) learn and respect the learner’s emotional reaction to the feedback; (3) confirm shared understanding of the feedback content and priorities; and (4) coach—set goals collaboratively and codevelop a realistic action plan to address priorities.

For instructors, becoming a coach means transitioning from providing didactic, directive feedback, to facilitating conversations about performance data in a manner that fosters learners’ engagement, reflection and planning for improvement. Coaching requires specific communication skills to facilitate self-reflection and self-critique, explore learners’ reactions to their performance and feedback, normalize their reactions, clarify and agree upon the priority messages in their data and feedback, and collaboratively identify goals and develop a realistic action plan to achieve them ([Armson et al., 2019](#)) (see sample coaching questions, [Box 37.3](#)).

Box 37.3

Key questions for coaching for improvement

- Now that we've discussed X, what is your goal for improvement?
- What do you need to do to reach your goal?
- How might I (your supervisor) be of assistance?
- What other resources or learning do you need?
- When should you hope to achieve this goal?

An important role of supervisors is to ensure the plan is appropriate and achievable (see sample action plan in [Box 37.4](#)). They can often be helpful by aiding learners in identifying resources needed to achieve their goals (e.g., an expert in the area who would be open to being observed or having a discussion, videos, access to simulated patients). Another central role of the coach is to help the learner identify criteria for success and a follow-up process, items that are often overlooked. The intent of coaching is twofold; to support learners in meeting their goals in the specific feedback situation at hand, and to teach and model the skills of self-regulation required for lifelong learning.

Box 37.4

Coaching action plan

Describe specific, observable change/s you intend to make.

For each:

1. What will you do?
2. When will you begin?
3. When do you think you will see results?
4. What resources will you need? Who can help you? What learning will you need?
5. What might get in the way of making the changes?
6. How will you overcome that?
7. How will you know you have achieved your goal?

Coaching, such as this with feedback and reflection, can be conducted during progress meetings with learners, such as occur at the end of a clinical rotation or periodically throughout the year, or 'in the moment' conversations following observation of a clinical activity or at the end of the clinical day. For the former, meetings would ideally be about 30 minutes to review learners' portfolios, end of rotation assessments and/or other assessment reports, with the opportunity for both supervisors and learners to prepare by reviewing the reports ahead of time. In-the-moment coaching conversations are necessarily limited to a few minutes by the busyness of the clinical setting and lack of time. However, the goal is similar, which is to leave the learner with a specific goal to work on and an action plan to achieve it.

Examples of coaching with feedback and reflection in different formats can be found on the R2C2 website: (<https://medicine.dal.ca/departments/core-units/cpd/faculty-development/R2C2.html>).

Summary

Feedback, reflection and coaching form a continuous, interdependent and synergistic strategy that permits learners to eliminate gaps in learning and continuously develop their knowledge, skills, attitudes and behaviours. These approaches promote learners' ability to undertake informed self-assessment, critique their own performance, take responsibility for their own learning, and strengthen their core abilities over time (Fig. 37.2).

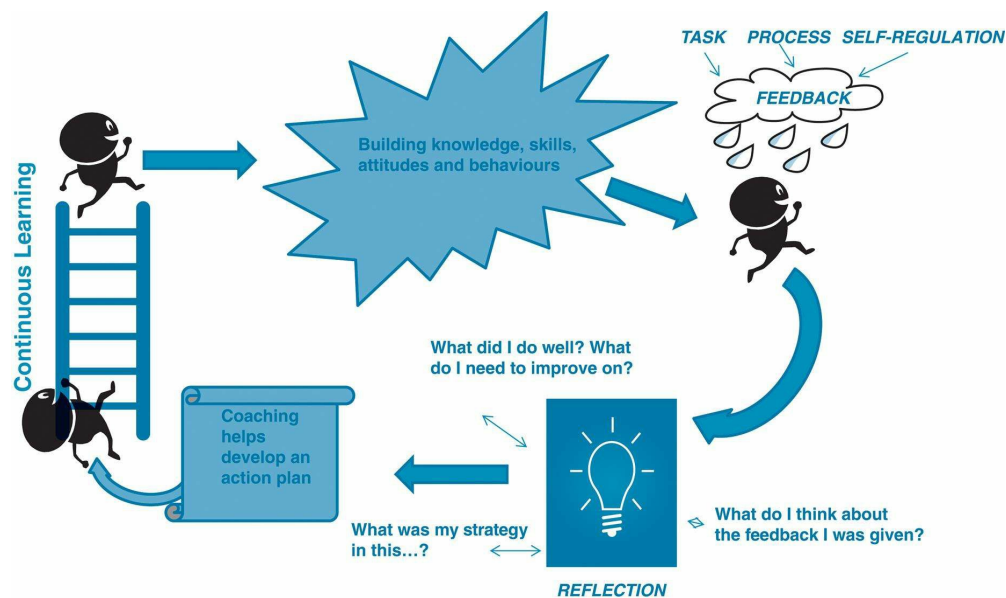


FIG. 37.2 Continuous learning.

Feedback, using the methodologies described in this chapter, allows learners to identify where they stand, while using the information to improve and reach the next level of achievement. Reflection permits them to develop insights into their own performance and promotes their ability to correct their approach to solving problems or performing a skill. Coaching, based on the feedback and reflection, helps a learner develop a plan of action leading to continuous improvement and learning over a lifetime.

References

- Ajjawi and Regehr, 2018 Ajjawi R, Regehr G. When I say...feedback. *Medical Education*. 2018;53:652–654.
- Armson et al., 2019 Armson H, Lockyer JM, Zetkulis M, Könings KD, Sargeant J. Identifying coaching skills to improve feedback use in postgraduate medical education. *Medical Education*. 2019;53:477–493.
- Aronson, 2011 Aronson L. Twelve tips for teaching reflection at all levels of medical education. *Medical Teacher*. 2011;33:200–205.
- Bing-You et al., 2018 Bing-You R, Varaklis K, Hayes V, Trowbridge R, Kemp H, McKelvy D. The feedback tango: an integrative review and analysis of the content of the teacher-learner feedback exchange. *Medical Education*. 2018;93:657–663.
- Brydges and Butler, 2012 Brydges R, Butler D. A reflective analysis of medical education research on self-regulation in learning and practice. *Medical Education*. 2012;46:71–79.
- Crommelinck and Anseel, 2013 Crommelinck M, Anseel F. Understanding and encouraging feedback-seeking behaviour: a literature review. *Medical Education*. 2013;47:232–241.
- Dudek et al., 2005 Dudek NL, Marks MB, Regehr G. Failure to fail: the perspectives of clinical supervisors. *Academic Medicine*. 2005;80:S84–S87.
- Dweck, 2006 Dweck CS. *Mindset: the new psychology of success* New York: Ballantine Books; 2006.
- Ericsson, 2015 Ericsson KA. Acquisition and maintenance of medical expertise: a perspective from the expert-performance approach with deliberate practice. *Academic Medicine*. 2015;90:1471–1486.
- Harackiewicz and Hulleman, 2010 Harackiewicz JM, Hulleman CS. The importance of interest: the role of achievement goals and task values in promoting the development of motivation. *Social and Personality Psychology Compass*. 2010;4:42–52.
- Hattie and Timperley, 2007 Hattie J, Timperley H. The power of feedback. *Review of Educational Research*. 2007;77:81–112.
- Hauer et al., 2012 Hauer KE, O'Brien BC, Hansen LA, et al. More is better: students describe successful and unsuccessful experiences with teachers differently in brief and longitudinal relationships. *Academic Medicine*. 2012;87:1389–1396.
- Krackov et al., 2017 Krackov SK, Pohl H, Peters AS, Sargeant J. Feedback,

- reflection and coaching: a new model. In: Dent JA, Harden RM, Hunt D, eds. *A practical guide for medical teachers*. Fifth edition. Edinburgh: Churchill Livingstone Elsevier; 2017.
- Pekrun, 2006** Pekrun R. The control-value theory of achievement emotions: assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*. 2006;18:315–341.
- Ramani et al., 2019 Ramani S, Konings KD, Ginsburg S, van der Vleuten CPM. Meaningful feedback through a sociocultural lens. *Medical Teacher*. 2019;41:1342–1352.
- Sargeant et al., 2010 Sargeant J, Armson H, Chesluk B, et al. Processes and dimensions of informed self-assessment: A conceptual model. *Academic Medicine*. 2010;85:1212–1220.
- Sargeant et al., 2018 Sargeant J, Lockyer JM, Mann K, et al. The R2C2 model in residency education: how does it foster coaching and promote feedback use?. *Academic Medicine*. 2018;93:1055–1063.
- Sargeant et al., 2008 Sargeant J, Mann K, van der Vleuten C, Metsemakers J. Reflection: a link between receiving and using assessment feedback. *Advances in Health Science Education Theory Practice*. 2008;3:399–410.
- Senge, 1999 Senge P. It's the learning: the real lesson of the quality movement. *The Journal for Quality and Participation*. 1999;22:34–40.
- Telio et al., 2016 Telio S, Regehr G, Ajjawi R. Feedback and the educational alliance: examining credibility judgments and their consequences. *Medical Education*. 2016;50:933–942.
- Tierney, 2008** Tierney WG. Trust and organizational culture in higher education. In: Välimaa J, Ylijoki OH, eds. *Cultural perspectives on higher education*. Dordrecht: Springer; 2008.
- van Nieuwerburgh, 2012 van Nieuwerburgh C. *Coaching in education: getting better results for students, educators and parents* London: Karnac Books; 2012.
- Watling, 2017** Watling, C. (2017). Coaching for CBME: Lessons from sports and music. p.2.
http://www.schulich.uwo.ca/about/competencybased_medical_education/
- Watling et al., 2013 Watling C, Driessen E, van der Vleuten CPM, Vanstone M, Lingard L. Beyond individualism: professional culture and its influence on feedback. *Medical Education*. 2013;47:585–594.

The Assessment of Attitudes and Professionalism

Val J Wass and Amanda Barnard

Trends

- Becoming more human: assessing values-based practice.
- Developing professional identity.
- Supporting reflective learning.
- Positive continuous formative assessment.
- Enactment at individual, team and institutional levels in the learning environment and workplace.

Key concepts

- Values-based practice: a framework which emphasizes the centrality of values in a continuous professional development; the diversity of values, which may remain unnoticed if they are presumed sheared; and the importance of health professionals developing skills to identify and negotiate values.
- Professional identity: one's professional self-concept based on attributes, beliefs, values, motives and experiences.
- Context specificity: professional development is specific to the culture and to the context in which it is practised.
- Reflective practice: the ability to reflect on one's actions so as to engage in a process of continuous learning.
- Formative improvement: the use of assessment to give the learner formative feedback on which they can reflect and act to build their professional identity.

Why assess professionalism? Setting the boundaries

The importance placed on the assessment of professionalism is growing. This has been partly instigated by demands, following failures in healthcare delivery, for stronger demonstration by clinicians of personal values (e.g., compassion, empathy, integrity), enacted through professional behaviours and reflected in the culture of the workplace. Evidence has emerged suggesting that poor professional behaviour at medical school can relate subsequently to unacceptable performance at work ([Papadakis et al., 2005](#)). Internationally, countries are setting up regulatory measures for practicing clinicians and developing codes of practice to be applied across the continuum of training and revalidation. There is increasing acceptance that professionalism must be taught explicitly in curricula. It is crucial, when assessing professional behaviour, to maximize educational impact and support self-directed reflective learning. The principle of learning from assessment must be applied to ensure the ongoing development of professionalism. Formative feedback on performance and professional behaviours is fundamental. It is of utmost importance that students are involved in the processes and value the assessments across the continuum of education from medical school through specialty training into continuous professional development.



Tip

Assessment is not a measurement problem but an instructional design problem: students must learn from it.

The original tendency to focus on 'fitness to practise' procedures and punish negative behaviours has come under review. There has been increasing concern that the focus on poor behaviour detracts from the positive aspects of exploring and developing professionalism. Fitness to Practise processes remain absolutely essential but general acceptance has emerged that the identification and documentation of negative lapses in professional behaviours is better placed in a separate system.

There is now an important trend to strengthen the positive, formative development of professional identity and behaviours across the continuum of clinical practice. Professionalism is key to the instructional design of the assessment programme. Assessments are being used increasingly as formative and reflective exercises to foster high levels of professional practice and concomitantly, identify and support struggling students early in training. Clearly if poor professional behaviour is identified as a cause for concern, the student can be referred into Fitness to Practise procedures but the two processes should remain distinct.

There are recognized boundaries to assessing an individual's attitudes. Internal values are personal and lie deep within the individual. They are not easy to access.

Health professionals should, without doubt, be aware of their internal attitudes and prejudices and how these might impact positively or negatively on their interactions with patients and colleagues. Self-awareness and critical reflection are areas which remain relatively overlooked in medical education.

External attitudinal behaviour is the parameter more open to assessment. This may be only the tip of an 'iceberg' of personal values but is a pragmatic reality. This chapter will focus on attitudes as expressed externally through observable behaviour. Maximizing the formative educational impact of the assessments is the aim. The focus is on assessment FOR learning and not assessment OF learning.

What do we mean by professionalism? Agreeing the definition

The first fundamental principle of any assessment is to achieve clarity on what is being assessed. Herein lies the major challenge. A generic universal definition of 'professionalism' eludes us (Birden et al., 2014). This is perhaps not surprising. Professionalism is a complex multifactorial construct open and sensitive to societal and cultural values within increasingly changing and rapidly globalizing healthcare settings. There may be general agreement about the values that underlie professionalism, yet cultural differences (e.g., confidentiality within family structure, consent by minors) must be respected. Although much of the published literature on professionalism has previously centred on Western medical education paradigms other cultural perspectives are now emerging (Hodges et al., 2019).

Every institution must therefore produce their own definition and learning outcomes to reflect their own local professional values. The training environment should reflect these values to ensure they are transparent and positively role modelled to learners. There is always the challenge that the hidden curriculum can undermine good intentions. Evidence is emerging that it can be helpful if students and staff are made aware of this (Neve & Collett, 2018). Congruence of professional behaviours by all staff is essential if assessments are to achieve the necessary positive educational impact.



Tip

Every institution must agree and enact its own definition of professionalism. It must be transparent to learners what is being assessed and why.

Professionalism is an umbrella term to define behaviours that support trustworthy relationships (Shapiro, 2018) For the purpose of this chapter the following definition is used.



"A concept associated with the education, training, attitudes and ethical practices of a group of workers or practitioners. It includes a regulated educational and training system that has specific standards that are monitored and maintained. It has an ethical framework, concerned with good working practices between practitioners and their clients. '...professionalism is characterised by a variety of reflective practices that practitioners engage into maintain their skills'."

Birden et al. (2014)

It highlights the complexity of the subject and the need to select a range of assessment

tools designed to promote appropriate learning. There is a knowledge base for professionalism relating to regulatory process and legal and ethical guidelines. Educators must focus not only on the learners' attitudinal behaviours but also ensure students know and can apply these ethical frameworks and integrate professional values into clinical skills. At the same time, the learner must develop strong reflective practices to develop understanding of their own attitudes and behaviour and meet the needs of not only patients and their families but also of colleagues across the healthcare team. This is challenging! An international working party on the assessment of professionalism highlighted the multidimensional and multipragmatic approach required when planning how to assess professionalism. It impacts on the health professional at three levels: (1) individual and personal, (2) interpersonal with the healthcare team, (3) at a wider institutional and societal level ([Hodges et al., 2011](#)). Using a multilevel framework for developing professionalism competencies and professional identity is important ([Barnhoorn et al., 2019](#)).



Tip

Professionalism is multidimensional and multiparadigmatic: it impacts on students at individual, interpersonal and institutional-societal levels.

When should professionalism be assessed?

Increasingly, it is recognized that professionalism is intrinsic to ongoing training and must be taught and assessed commencing at entry to medical training. A call for medical school selection processes to be based more strongly on personal values is being made and regular performance appraisal is becoming a norm within career development. It is now mandatory in some countries for doctors to maintain reflective portfolios based on the collation of professional experience for regular revalidation processes through to retirement. Formative continuous assessment along the novice to expert pathway is becoming essential. This represents a very significant move from the past tendency to only identify and address the fortunately rare lapses in professional performance.



Tip

Assessment of professionalism lies across a continuum from entry to exit.

How should professionalism be assessed?

Step 1: A fundamental principle

Professionalism is a context or case-specific attribute; it cannot be assessed as a generic attribute. Professional behaviour is embedded in the context in which it is enacted. This is not surprising. When interacting with patients, the clinician's response is inevitably intertwined with their knowledge, skills, personal feelings, interpersonal interactions and healthcare systems. It can be very different handling a challenging regular patient in the morning outpatient clinic with familiar staff to dealing with an equally challenging emergency in the middle of the night with locum staff. Although much of the assessment of professionalism fits into our normal assessment paradigms, the complexity demands that professional behaviour must be assessed across a range of contexts over time using a variety of assessments and, if appropriate, discussion about different paradigms and epistemology.



Tip

Professional behaviour is not generic or time specific. Assessment requires a range of contexts and perspectives over time.

Step 2: Curriculum design

Professionalism must have clear, explicitly visible, assessable learning outcomes. These must be championed from the start of the course using sequential development of increasing complexity along the novice to expert learning pathway. Developing a vertical professionalism strand across all years of the curriculum led by a strong educational advocate can enable horizontal integration across the different clinical contexts and progressively spiralling complexity of learning. The assessment programme should then mirror and support this (O'Sullivan et al., 2012).

Step 3: Consider framing assessments against a published code of conduct

Well-designed codes of conduct are available. These are designed for practicing doctors. There is an international move, in line with the early development of professionalism and professional identity, to establish, preferably in partnership with students, codes of conduct. (e.g., <http://micn.otago.ac.nz/wp-content/uploads/micn/2008/03/20151217-medical-student-code-of-conduct-2015.pdf>). Although to date these codes mainly originate in Western healthcare systems, they can be adapted to provide a structure for collating and monitoring the positive formative development of professional behaviour.

It is not necessary to reinvent the wheel. Adopting or modifying an established code of conduct is acceptable to provide a framework for students to plan and gather evidence to build a portfolio of developing professional behaviour. For examples see [Box 38.1](#):

Box 38.1

Examples of published codes of conduct

CanMEDS: <http://www.royalcollege.ca/canmeds/framework>

Good Medical Practice: <http://www.gmc-uk.org/>

Medical Board of Australia: <http://www.medicalboard.gov.au/Codes-Guidelines>

Step 4: Blueprinting

As with any assessment, blueprinting is essential to ensure all the learning outcomes for the vertical professionalism theme are covered at appropriate points in the course. This must mirror the educational intent and be transparent to students. Given the content/case specificity of professionalism (step 1) blueprinting can ensure it is assessed longitudinally over a wide range of contexts, at increasing levels of complexity, by sufficient different assessors. It should achieve a comprehensive balance across all the defined components. The horizontal/vertical integration of professionalism within the curriculum (step 2) offers the opportunity to incorporate professional behaviour either into stand-alone assessments or integrated in clinical scenarios and workplace-based assessments. To ensure reliability multiple assessments and a range of assessors contextualized across the curriculum must be achieved ([Wilkinson et al., 2009](#)).



Tip

For reliability multiple assessment tools and assessors across the curriculum are needed.

Step 5: Be clear of the purpose of each assessment

Clarity of purpose is essential when designing the components of any assessment programme. Professionalism is no exception. The selected method must offer validity, that is, measure what it sets out to measure, and appropriately assess the intended learning and behaviours. It must be clear whether the primary purpose of the assessment is to be formative to provide feedback and set actions for improvement or summative to measure achievement learning outcomes.



Tip

Be clear of the purpose of the assessment and select a valid tool.

Step 6: Choosing a valid assessment tool

Multiple tools are available, and a range must be used. Miller's Pyramid ([Fig. 38.1](#)) offers a helpful framework as outlined later. A suite of tools is available to progressively assess across increasing expertise. Professionalism, as the three-dimensional Miller's model demonstrates, can be intrinsic to them all. The amended version ([Cruess et al., 2016](#)) introduces the development and assessment of professional identity formation as the ultimate assessment point.

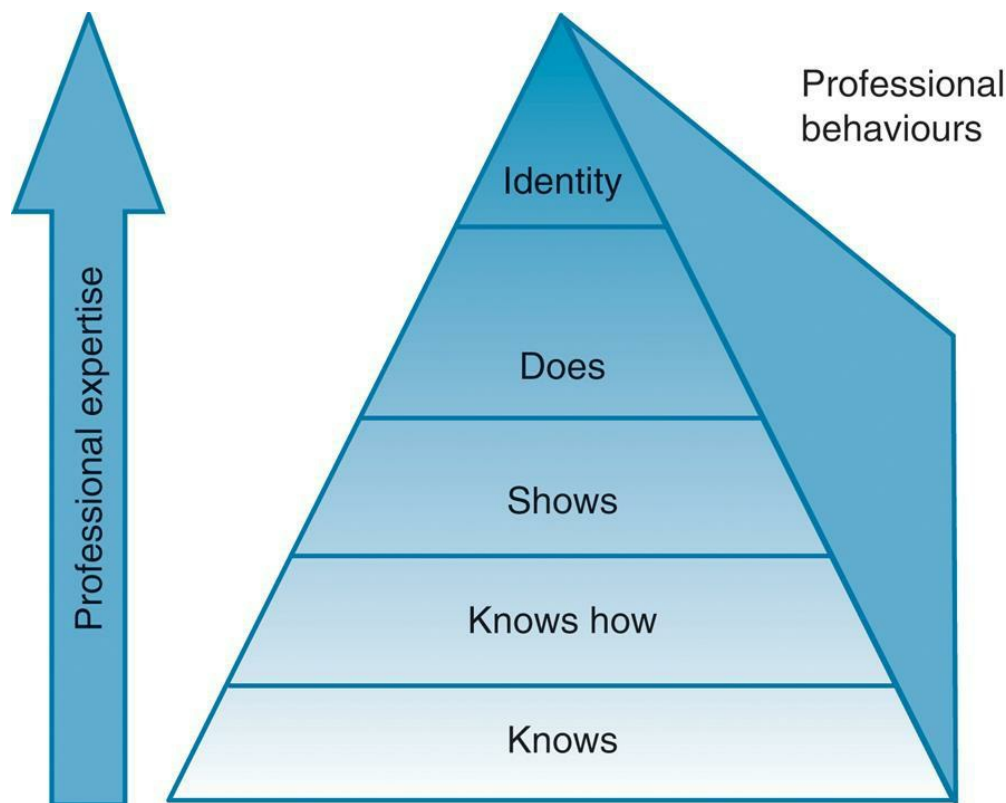


FIG. 38.1 Miller's pyramid

Step 7: Train the assessors

Faculty must aim to ensure assessors own and enact the professional values of the institution. Positive role modelling is important and not always easy to achieve. Training assessors is essential to ensure consistency of delivery and judgement in delivering the assessments, and importantly in providing feedback. Agreeing and

internalizing what is being assessed is fundamental to making reliable judgements. There has been a tendency to make check lists and dissect out the elements of professional behaviour. Evidence now suggests assessors can be trusted to judge more globally. This makes sense given the complexity of professional behaviour and its often seamless integration within a clinical context. The concept of entrustment may be a useful model to frame judgements. It must be recognized that there is inevitably a subjective element to assessments with both tangible and intangible social capital affecting ratings. Assessors need to be aware of their own biases. It is difficult for an assessor to dissect out the components of these constructs which, with increasing expertise, have become more implicit (unconscious competence) than explicit (conscious competence) in their own professional practice. Assessors need help to unpick this and understand the domains being assessed.



Tip

Beware of atomization: value the assessors' expertise to make global judgements.

Step 8: Engage the students

Student engagement at all levels of the process is crucial. Using assessment innovatively to ensure students engage with learning about professionalism and develop the necessary reflective learning skills is essential. All stages of the assessment process need to be transparent and explicit encouraging formative feedback and ongoing personal development. With increasing awareness of the need to foster the humane side of clinical practice, alongside the scientific learning, assessing professionalism carries an important role as a learning tool. Students need to understand that Faculty seek and value evidence of values-based behaviours (e.g., compassion and empathy) within the working environment, integrity and honesty with patients and peers, and caring interactions with patients. The assessment programme for professionalism offers the opportunity to build on Social Behavioural Science learning and engage with students to achieve this (Carney et al., 2016).



"Our great task is to succeed in becoming more human."

Jose Saramago, Nobel Prize Laureate, 1998

The tools

Miller's Pyramid provides a useful framework for categorizing the main tools currently used to assess professionalism. Overviews and reviews can be found in [Stern \(2006\)](#) and [Wilkinson et al., \(2009\)](#). A range of tools exists to assess behavioural competencies; only a small proportion offers strong evidence of validity and reliability. Before selecting the appropriate tool, it is important to blueprint (step 4) and consider the purpose (step 5). For practical reasons the selection offered here is deliberately limited to account for: (1) evidence of reliability, validity and acceptability, (2) emerging new methodology, (3) the balance between formative intent to offer feedback and summative measurement of learning outcome achievement, (4) the drive to assess values-based practice at the level of 'does'. [Table 38.1](#) summarizes the tools under discussion. Ongoing development of new assessment methodology should be encouraged as we strive to develop stronger values based professional identity ([Cruess et al., 2016](#)).

Table 38.1 Tools for Miller's assessment levels

| Miller's assessment level | Assessment tool |
|--|---|
| Knows: knowledge of legal definitions/regulatory frameworks | Written multiple-choice question (MCQ)/short-answer question (SAQ)/essays/group assignments |
| Knows how: applies this knowledge in increasingly complex situations | MCQs with scenarios/case studies/modified short essay questions (MEQs)/situational judgement tests/ reflective activities, e.g., critical incident |
| Shows how: demonstrates skills and behaviours with relevant knowledge | OSPE/OSCE/clinical simulations/standardized professional encounters |
| Does: observation in practice | Multisource feedback (MSF)/peer review (e.g., mini-PAT)/mini-clinical evaluation exercise/(mini-CEX) professional mini-evaluation exercise (P-MEX)/entrustable professional activities (EPAs)/case-based discussion |
| Identity: consistently demonstrates the attitudes, values and behaviours expected of one who thinks, acts and feels like a physician | Reflective exercises using framework of multilevel professionalism Ongoing assessment of continuous professional development and quality improvement activities |

OSPE/OSCE, Objective Structured Practical Examination/Objective Structured Clinical Examinations.

Cognition: Knows

The factual knowledge base of professionalism can be assessed through conventional written assessments, such as multiple-choice questions (MCQs), short-answer questions (SAQs) and essays. Although these formats are arguably easier to deliver, factual answers sit uncomfortably within the complexity of professional practice except perhaps in the early stages of medical school. At this level, there may be a place for questions such as: “What is the age at which a minor can legally give informed consent for an appendicectomy?”

Cognition: knows how

Assessing application of knowledge is strongly recommended. Even at novice level, clinical scenarios can be embedded in MCQs and SAQs or used to focus group assignments. The latter may involve a reflective element and can be useful in interprofessional learning situations. Across the continuum of training, increasingly complex written and reflective tasks can be introduced. These may be based on hypothetical scenarios (modified essay questions [MEQs]; situational scenarios or real patient case studies which are role relevant at the appropriate training level). An example might be:

A 16-year-old boy with a learning disability is brought to the Accident and Emergency department. He needs an urgent appendicectomy. His parents cannot be contacted. Applying the legal and ethical frameworks you have learnt; how should you proceed?

Situational judgement tests (SJTs) ([Patterson et al., 2016](#)) are increasingly used as tests for entry into training. SJT scenarios are designed to assess judgement in increasingly complex clinical work situations, can be written or video based and focus on inter- and intrapersonal dilemmas. Their potential to teach and assess professionalism is promising. Personal reflective activities play an important role and can be designed to apply knowledge to clinical experiences at all three levels of professionalism- individual, interpersonal and institutional. Such activities can be focused and structured for individual reflection or as part of a wider forum, for example, through moderated discussion boards. Responsive, supportive feedback is essential for reflective activities.



Tip

Aim to assess cognitive knowledge at a contextually applied level.

Behaviour: shows how

Active observation of a student’s interaction with a ‘staged’ clinically relevant

simulated scenario enables students to demonstrate how they would handle the situation professionally. At this level scenarios may have an explicit stand-alone professionalism theme or, with increasing complexity, one which integrates attitudinal/professional behaviour into a patient/doctor interaction. Objective Structured Practical/Clinical Examinations (OSPEs/OSCEs) with standardized simulated patients in various formats can simulate increasing complexity and are popular. For example:

As the resident on call doctor you are asked to see the mother of a 16-year-old boy with a learning disability following an emergency appendicectomy. She is angry about his care and wants to discharge him against medical advice.

When assessing at healthcare team and institutional levels, standardized professional encounters using health professionals enacting scenarios centred on interprofessional behaviours are useful. With the increasing focus on professional behaviours at these levels, more complex simulations are gaining favour to reflect actual practice. The consequences of unsatisfactory performance in the 'professional' criteria of an integrated OSCE or clinical simulation need to be carefully delineated.

Behaviour: does

There is now a significant move towards more authentic assessment in the workplace at a 'does' level by direct observation of interactions in the workplace specific or over time. A variety of assessment tools are available ([Norcini & Burch, 2007](#)) into which professionalism can be specifically assessed or integrated. Again, it is important that assessors understand, personally enact and are trained to implement the institutional parameters set for professionalism when making judgements and giving feedback (steps 3, 7).

Multisource feedback (or 360-degree review) from a range of work-related colleagues (professional peers or supervisors, associated healthcare workers, patients) is replacing the more traditional single supervisor assessment of observed behaviours in the clinical setting and workplace. If properly applied, this is proving a valid means of gathering information at the individual and team level within a workplace environment. These reviews are questionnaire-based ratings on selected behaviours extensively used in industry and now more frequently health settings ([Donnon et al., 2014](#)). There are several validated tools, and increasingly a number of commercial offerings. Peer review can also be used with preclinical student groups, focussing on the professional behaviours relevant to the stage of training, for example, teamwork, reliability, and respect for diversity. It is important that these assessments are initially formative, before any summative application and that feedback, particularly when negative, is supportive.

Tools such as the mini-clinical evaluation exercise (mini-CEX) offer specific contextualized observations of professional behaviours and can evaluate clinical performance in real life settings and offer feedback building, importantly, actions for improvement. The professional mini-evaluation exercise (P-MEX) is designed specifically to evaluate 24 attributes of professionalism, which are grouped into four categories: doctor-patient relationship skills; interprofessional relationship skills;

reflection skills; and time-management skills ([Cruess et al., 2006](#)).

Entrustable professional activities (EPAs) is an emerging tool increasingly used in undergraduate and postgraduate education. EPAs translate competencies, which can map to professionalism frameworks (step 3), into discrete units of professional work entrusted, or delegated, to a student. Like all assessments EPAs need deliberative selection to cover elements of professionalism ([Ten Cate et al., 2015](#)).

Tools across the continuum—a portfolio of professionalism

A professional portfolio, starting at medical school entry, is proving a very useful tool to collate, monitor and strengthen the positive, formative development of professionalism across the continuum of clinical practice ([Buckley, Coleman, & Davison et al., 2009](#)). A framework (step 3) to guide the structure of the portfolio is helpful. The longitudinal and purposive collection of material can effectively demonstrate reflective practice on progress and achievements and address the disjunction that often appears between undergraduate study and postgraduate training.

A professional portfolio may contain:

- Personal and professional development plan
- Results of specific assessments: multisource feedback, peer review, mini-CEX, P-MEX
- Reflective assessment tasks
- Critical incident reflections
- Evidence of appropriate self-care activities
- Records of meetings with supervisors
- Sign off documents for particular skills or competencies

Summary

Healthcare in the 21st century is demanding more humane values-based professional behaviour. This must be integrated into curricula and assessed formatively, positively and continuously across the spectrum of training from novice to expert fostering self-awareness, reflective practice and the ongoing development of professional identity. One challenge lies in the complexity of professionalism at societal and cultural levels. It must be defined at local institutional level, owned and enacted by all staff and be explicit and transparently shared with students. Professionalism is a contextualized, not generic, attribute and must be assessed using a variety of tools, cases and assessors across time aiming to monitor enactment in the workplace at individual, team and institutional levels. Assessment for learning should underpin the process maximizing educational impact and student engagement. With globalization and changing demands on healthcare, ongoing development is essential; new tools should be encouraged and robustly validated as we strive to 'become more humane'.

References

- [Barnhoorn et al., 2019](#) Barnhoorn PC, Houtlosser M, Ottenhoff-de Jonge MW, et al. A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Medical Teacher*. 2019;41(3):303–308.
- Birden et al., 2014 Birden H, Glass N, Wilson I, Harrison M, Usherwood T, Nass D. Defining professionalism in medical education: a systematic review. *Medical Teacher*. 2014;36(1):47–61.
- [Buckley et al., 2009](#) Buckley S, Coleman J, Davison I, et al. BEME Guide: No 11 The educational effects of portfolios on undergraduate student learning: A Best Evidence Medical Education (BEME) systematic review. *Medical Teacher*. 2009;31(4):282–298.
- [Carney et al., 2016](#) Carney PA, Palmer RT, Fuqua Miller M, et al. Tools to assess behavioural and social science competencies in medical education: a systematic review. *Academic Medicine*. 2016;91(5):730–742.
- Cruess et al., 2016 Cruess R, Cruess S, Steinert Y. Amending Miller's pyramid to include professional identity formation. *Academic Medicine*. 2016;91(2):180–185.
- [Cruess et al., 2006](#) Cruess R, McIlroy JH, Cruess S, Ginsburg S, Steinert Y. The Professionalism Mini-evaluation Exercise: a preliminary investigation. *Academic Medicine*. 2006;81(10 Suppl):S74–78.
- [Donnon et al., 2014](#) Donnon T, Al Ansari A, Al Alawi S, Violato C. The reliability, validity, and feasibility of multisource feedback physician assessment: a systematic review. *Academic Medicine*. 2014;89(3):511–516.
- [Hodges et al., 2011](#) Hodges BD, Ginsburg S, Cruess R, et al. Assessment of professionalism: Recommendations from the Ottawa 2010 Conference. *Medical Teacher*. 2011;33(5):354–363.
- [Hodges et al., 2019](#) Hodges B, Paul R, Ginsburg S. The Ottawa Consensus Group Members Assessment of professionalism: From where have we come - to where are we going? An update from the Ottawa Consensus Group on the assessment of professionalism. *Medical Teacher*. 2019;41:249–255.
- [Neve and Collett, 2018](#) Neve H, Collett T. Empowering students within the hidden curriculum. *Clinical Teacher*. 2018;15:494–499.
- [Norcini and Burch, 2007](#) Norcini J, Burch V. AMEE guide: no 31

- Workplace-based assessment as an educational tool. *Medical Teacher*. 2007;29:9–10.
- [O'Sullivan et al., 2012](#) O'Sullivan H, Mook, van der W, Fewtrell W, Wass V. AMEE Guide: no 61 Integrating professionalism into the curriculum. *Medical Teacher*. 2012;34:E64–E77.
- [Papadakis et al., 2005](#) Papadakis MA, Therani A, Banach MA. Disciplinary action by medical boards and prior behavior in medical school. *New England Journal of Medicine*. 2005;353:2673–2682.
- [Patterson et al., 2016](#) Patterson F, Zibarras L, Ashworth V. AMEE Guide: No 100 Situational judgement tests in medical education and training: Research, theory and practice. *Medical Teacher*. 2016;38(1):3–17.
- [Shapiro, 2018](#) Shapiro J. Confronting unprofessional behaviour in medicine. *British Medical Journal*. 2018;360:1025.
- [Stern, 2006](#) Stern DT. *Measuring professionalism* Oxford University Press 2006.
- [Ten Cate et al., 2015](#) Ten Cate O, Chen HC, Hoff RG, Peters H, Bok H. AMEE Guide: No 99 Curriculum development for the workplace using Entrustable Professional Activities (EPAs). *Medical Teacher*. 2015;37(11):983–1002.
- Wilkinson et al., 2009 Wilkinson TJ, Wade WB, Knock LD. A blueprint to assess professionalism: results of a systematic review. *Academic Medicine*. 2009;84(5):551–558.

Programmatic Assessment

Cees van der Vleuten, Sylvia Heeneman and Lambert WT Schuwirth

Trends

- A holistic view on assessment is emerging in which formative and summative assessment strategies are combined.
- Competency-based education is spreading both at the undergraduate and postgraduate level of training, but is hampered by an appropriate assessment approach.
- Programmatic assessment has been proposed as a means to make assessment aligned with a constructivist view on teaching and learning.

Key concepts

- Programmatic assessment is a purposeful quantitative and qualitative inquiry on the competence of a learner.
- Stakes of the assessment replace the formative/summative distinction.
- High stakes decisions require abundant data.
- By sampling across time, methods of assessment and assessors, assessment data is triangulated into a meaningful and trustworthy interpretation.
- Feedback use and self-directed learning are promoted through creating a dialogue with learners in trusted relationships.

Introduction

Programmatic assessment is an alternative way of arranging assessment in a training programme and a different look on how assessment may function to promote learning. Any individual assessment involves a compromise on quality criteria ([Van der Vleuten, 1996](#)). One cannot have perfect reliability, validity, educational impact, acceptability and low cost. The choice of compromise depends on the context and the purpose of the assessment.

The question really is when to optimize what. The central notion in programmatic assessment is that we shift from optimizing individual methods of assessment on all possible quality criteria towards optimizing the programme as a whole, to optimize the alignment of weaknesses and strengths of the different methods to ensure the strength of the overall judgements of assessment as a whole. By doing so we make different choices. In making those choices, educational arguments weigh heavily to optimally promote learning by learners. In this chapter, we will explain aspects of the traditional approach to assessment where programmatic assessment can be an improvement. We will then proceed to explaining programmatic assessment itself, followed by an illustration of an existing programme. We will end with some reflections and issues that are found in recent implementations of programmatic assessment.

The traditional approach

The most dominant approach to assessment is to have a course with an assessment at the end which one has to pass. The performance of the learner is compared with a minimum standard. If a learner fails, then usually s/he has to re-sit the entire exam. With multiple failures, the learner usually has to redo the course and repeat the assessment. In this way learners navigate through a full training programme. Many training programmes have another comprehensive assessment at the end: a final exam. When all exams have been passed, the learner is considered to be competent for either further learning in another programme or for professional practice. This classic approach to learning is old and has served us well, but we argue there are improvements possible.

The traditional approach is modular. It assumes that when learners pass, they have mastered the whole domain they were learning. Although the learning occurs for the assessment occasion, the assumption is that the learner will have 'mastered' this for the remainder of their life. Often, this is not likely to be true. Forgetting is quite normal, psychology research has shown that 50% of the learned subject matter is already forgotten after a few weeks.

One of the most fundamental problems in education is the issue of transfer. Having knowledge is no guarantee whatsoever that the learner will be able to use that knowledge when appropriate, that is, when needed to manage a professional task. So mastery at one moment in time bears little relationship with its use at a later moment. Pure mastery learning is therefore in many domains considered an outdated model of learning. Modern learning programmes are based on 'constructivist' notions: learning occurs more effectively and efficiently if the learner actively 'constructs' the information or knowledge. Learning means 'processing information' rather than 'consuming' it. Meaning making of information, understanding it and using it, makes learning productive. Teaching is therefore more than transmitting information. It has to facilitate the learners in making maximum meaning of it through a continuous practice of transfer using professionally increasingly authentic tasks. Knowledge, skills and attitudes are integrated in 'whole tasks' ([Vandewaetere et al., 2015](#)). Problem-based learning, team-based learning, competency-based learning, and outcome-based learning are illustrations of modern education approaches that are founded on this constructivist notion of learning. These approaches are widely used in undergraduate and postgraduate education in medicine.

A traditional approach to assessment may promote poor learning behaviours. Learners orientate their learning to passing the assessment ([Cilliers et al., 2012](#)), because that maximizes their success of passing the assessments. For learners the assessment is the curriculum. Therefore learning will be as good as the assessment requires. In many education practices however, poor learning styles are promoted. Examples include the rewarding of rote memorization strategies, minimal preparation strategies because of minimal standards or competing exams, or procrastination because of abundant resit opportunities.

Typical of modern programmes is a move beyond the knowledge domain. Many countries in the world have developed competency frameworks. These frameworks have been developed with substantial stakeholder input. What is striking is the commonality across these frameworks. In different descriptions, they emphasize skills, such as communication, collaboration, professionalism, reflective abilities, leadership and so on. Given the overlap across frameworks there seems to be consensus on what we wish our professionals to be able to do and what skills are needed to improve healthcare. These skills are indeed important because they define success and failure in the labour market. Some therefore call them 21st-century skills or soft skills. We choose the term 'domain-independent skills', because they are relevant for any domain of learning, also outside medicine. Embracing these skills in education has major consequences. First, they cannot be taught and tested in a single course. One cannot have a course on 'communication' of 4 weeks, have a test (e.g., an Objective Structured Clinical Examination [OSCE]) and conclude the learner is a good communicator. These skills are learned longitudinally over longer periods of time. They have to be demonstrated in (daily or habitual) performance and are shaped through ongoing feedback. Domain-independent skills therefore have to rely heavily on unstandardized assessment using methods from the top of Miller's Pyramid ([Miller, 1990](#)). Modern training programmes embracing these competency frameworks typically structure curricula with these competencies as continuous 'learning lines' throughout a programme. But, the longitudinal nature of this approach is not easily reconciled in a traditional mastery-oriented assessment approach.

Traditional assessment systems often lack feedback. For economic reasons many assessment practices keep the content of the assessment (e.g., the items) secure to learners. If anything more than pass or fail is communicated, it is usually in the form of grades. Grades represent a poor form of feedback ([Shute, 2008](#)). When assessing domain-independent skills grades are rather useless because they do not provide information on how to improve. When complex skills are captured in a metric or in so-called objective lists of performance, it often trivializes what is being measured and often invites poor learning strategies. Nothing stimulates learning more than high-quality feedback, but our education practices are frequently feedback deprived.

Finally, traditional approaches to assessment do not reward self-directed learning which is so important for life-long learning. In a traditional, mastery-learning assessment approach there is not much to self-direct. Everything is fixed and standardized through the stationary set of assessments.

Overall, traditional approaches to assessment can therefore be characterized as rather reductionist. There is little information in the system, and promotion is completely based on discrete and stacked performance decisions (on minimal performance) often leading to unwanted educational side effects. This is concerning because whenever there is a friction between the education goals and the realized assessment goals, the assessment tends to prevail. Therefore modern education programmes need a different approach to assessment.

Programmatic assessment

Programmatic assessment is based on a set of assessment principles that are derived from the research on assessment (Van der Vleuten et al., 2010). Table 39.1 provides a summary.

Table 39.1 Principles of assessment derived from past research, separate for standardized and unstandardized assessment.

| Standardized assessment | | |
|---|---|--|
| Assessing 'knows', 'knows how', 'shows how' from Miller's Pyramid | Description | Practical implications |
| 1. Competence is context specific, not generic | Any performance on a test element (item, case, oral, station, patient) is not very predictive for performance on another element, regardless of the method. This has been called the content-specificity problem. It relates back to the issue of transfer. | <ul style="list-style-type: none"> • Broadly sample performance across content within each assessment • Combine information across assessment or across time • Avoid high-stake decision on a single assessment |
| 2. Objectivity is not the same as reliability | Given the content specificity problem sampling is the dominant strategy for achieving reproducible test information. Subjective measures can be reliable, objective measures can be unreliable, all depending on the sampling. | <ul style="list-style-type: none"> • Use holistic professional judgement when it is needed • Use many subjective judgements in combination |
| 3. What is being measured is more determined by the stimulus format than by the response format | The task given to the learner (stimulus format) in a test determines much more what the test is measuring than the way the response is captured. Different formats may measure similar or different things all depending on the stimulus format. | <ul style="list-style-type: none"> • Any method may assess higher-order skills • Produce stimulus formats that are as authentic as possible for the learning task (e.g., scenarios, cases, etc.) • Use learning tasks as assessment tasks |
| 4. Validity can be 'built-in' | Quality assurance measures in developing test material have a profound impact on the quality of the test material. Quality assurance can be done | <ul style="list-style-type: none"> • Organize quality assurance cycles in item and test |

| | | |
|--|---|--|
| | prior (e.g., item-writing), during (e.g., good instructions) and posttest (e.g., item and test analysis). | development <ul style="list-style-type: none"> • Use peer review • Use psychometric information • Use student input |
|--|---|--|

| Unstandardized assessment | | |
|--|--|--|
| Assessing 'Does' | Description | Practical implications |
| 5. Bias is an inherent characteristic of professional judgement | Whenever a judgement is made some bias will be introduced. Bias is not a reason to not use holistic professional judgement. Professional judgement is imperative to assess complex skills. Strategies to reduce bias should be used. | <ul style="list-style-type: none"> • Use sampling to reduce systematic errors • Use procedural measures of due diligence to reduce unsystematic errors that build to the credibility of the judgement (e.g., committee decisions, multiple cycles of feedback, learner agency in the decision process, etc.) |
| 6. Validity lies in the users of the instruments, more than in the instruments | The seriousness with which the assessment is conducted defines the value of the assessment. Giving and receiving feedback is a skill. The people are therefore important. | <ul style="list-style-type: none"> • Prepare and train assessors and learners for their role in the assessment • Create working conditions that embed assessment possibilities |
| 7. Qualitative, narrative information carries a lot of weight | For many assessment situations 'words' tell more than 'scores'. This is particularly true for complex skills such as the domain-independent skills. | <ul style="list-style-type: none"> • Use words for assessing complex skills • Be aware unwanted side-effects of quantified information |
| 8. Feedback use requires scaffolding | Feedback is often ignored, particularly in summative settings. Feedback use is promoted by the quality of the feedback, the credibility of the source, by reflection and by follow-up. | <ul style="list-style-type: none"> • Create feedback dialogues • Create feedback follow-up • Create meaningful relations between teacher and learners |
| Overall | Description | Practical implications |
| 9. No single method is perfect | No single assessment method is able to cover all elements of Miller's Pyramid. Any individual method will always involve a compromise. | <ul style="list-style-type: none"> • Vary in use of assessment methods • Combine information from multiple assessment sources |
| 10. Assessment drives learning | The assessment dictates what and how the learner will learn. Any learner will optimize strategies for maximum success in the assessment. | <ul style="list-style-type: none"> • Verify the effect of assessment on learning • Use the effect strategically to promote desired learning effects |

From [Van der Vleuten et al., 2010](#).

To explain programmatic assessment, a curriculum metaphor is useful. In the past, a

curriculum was the amalgamation of what individual teachers made of it. In modern programmes this is no longer the case. There is governance over the curriculum by making a plan, by implementing it, by evaluating it and by rearranging it. One makes a deliberate choice to address a topic over here, to return to the topic over there, etc. The sum is more than the whole of its parts. Likewise, programmatic assessment is based on an integral plan of assessment. Deliberate choices are made in terms of methods used and when they are used. A variation of methods is thus used in a purposeful way, particularly depending on their educational function at that moment in time and in relation to the assessment programme as a whole. Some will require verbalization, others synthesizing information, writing, reporting, performing and so on. The choices are deliberate because of their contribution to the total programme. Like a curriculum, the assessment programme is continuously evaluated and changed when needed. Fundamental in programmatic assessment is the removal of pass/fail decisions from each individual assessment moment; instead decisions are only taken when sufficient information is gathered.

Based on the principles of assessment (see [Table 39.1](#)) and on earlier research on what makes a good assessment programme ([Dijkstra et al., 2012](#)), we have formulated the following seven pillars in programmatic assessment ([Van der Vleuten et al., 2012](#)):

1. Each (part of) assessment is only one data point. Recognizing the notion that any single assessment is a compromise and that no perfect assessment exists that is able to optimize all quality elements of assessment, we see every assessment as a single data point only.
2. Every data point is optimized for learning. For a single assessment no compromise is made on the educational consequences.



Tip

Maximize meaningful feedback to the learner in individual data points.

A single data point is optimized for learning, which means that it has to be rich in nature (either in [profile] scores or words), meaningfully informing the learner, and authentic for the learning task. Sometimes it may be sufficient to provide feedback and sometimes it needs to be triangulated with other data points. At other times the learning task itself is assessed. The intent is to support and promote good learning and good learning strategies. The choice for a particular method is dependent on an educational justification of this method for a purpose at this moment in time. There are no 'bad' methods. In the past, some methods were removed from the toolkit because they were considered to be too subjective (e.g., the oral examination or the long case). Subjectivity is not a problem in assessment, it is always an evaluative process in which observations are used to arrive at a judgement of the learner's competency or progress. But, this should not mean that the

decision making is not robust; multiple subjective judgements can easily be made robust (see principle 2, [Table 39.1](#)). When more complex skills need to be assessed, professional judgement is indispensable. Such judgements may also come from peers or patients. Any method (old or new) that credibly facilitates these elements and that works educationally meaningfully in the particular education context can be an appropriate method.

A plea is made for both course-related assessment and longitudinal or continuous assessment. Traditionally, course related assessments dominate, but when a training programme relies on competency frameworks domain-independent skills, and personal development are seen as important, more longitudinal assessment is required. Complex skills, such as communication or professionalism, are learned in a longitudinal fashion. Therefore they need longitudinal assessment, where we look at personal growth over time. Even knowledge can be assessed longitudinally, such as with progress testing ([Wrigley et al., 2012](#)).

3. Assessment consequences represent a continuum of stakes. In programmatic assessment the terms 'formative' and 'summative' are replaced by a continuum of stakes. This continuum ranges from low stakes to high stakes.



Tip

Remove pass-fail decision making from individual data points.

A pass/fail decision is removed from a single data point, making the assessment low stakes. Low stakes is not the same as 'no stakes'. The information from a low stake data point may be used later in higher-stakes decisions.

4. Stakes and number of data points are related. The higher the stakes of the decision, the more robust the information must be on which the decision is made. A distinction is made between intermediate and final decisions. Intermediate decisions are made during the training programme, for example once or twice during the year. They are based on a number of data points. A decision can be expressed as a pass/fail or in any other qualification terminology. More important than the qualification is that intermediate decisions are also diagnostic (How is the learner progressing?), therapeutic (What remedies are needed?) and prognostic (What is the most likely outcome for the learner?). Intermediate decisions may be followed by remediation. Remediation is fundamentally different from re-takes or resits. Remediation is personal and the learner will have to demonstrate the remediation has been carried out and has been effective. Final decisions are in order when a progression decision is needed (or selection or graduation decision).



Tip

High-stakes decisions should be based on many data points; consider that many pixels will provide a clearer image.

Final decisions are high stakes and therefore based on a lot of data points.



Tip

Any individual assessment is but one data point with limited utility. Consider a data point to be similar to a pixel of an image.

Data points can be compared with pixels in a photograph. An individual pixel will not tell you much. A combination of pixels will start to give an image. Sometimes with few pixels, the image is already clear, with others many more pixels are needed to arrive at the image. Information gathering and decision making is purposeful. Information is triangulated. Potential patterns emerge from the information. The stronger the pattern the clearer the image becomes. Depending on the information, saturation will occur.

5. Learners are guided in feedback use.



Tip

Feedback use and self-directed learning require educational scaffolding through the creation of a dialogue between learner and entrusted teacher (mentor).

Feedback use and self-directed learning are promoted by creating a dialogue through social interaction. One powerful way is through mentoring. Creating an entrusted relationship with a respected person/teacher with whom all assessment and feedback information is shared and discussed is an effective strategy for using feedback. Learners prepare meetings. Learners self-direct their learning through analysis of assessment and feedback data and (may) set learning objectives to follow-up in subsequent assessment or feedback moments. When done well, learners will actually describe the image emerging from the pixels. Mentors ask questions, probe, stimulate deep reflection, discuss remediation activities, and support the learner in any other way possible, but mentors are not psychotherapists. The focus is on learning and wellbeing, but there are limits to the personal support given, as mentoring is a resource intensive activity. Alternative social interaction

might be possible as well, such as peer groups and near-peer buddy systems. The longer the personal relationship lasts, the more effective mentoring will be.

6. Aggregation of assessment through meaningful entities. Taking intermediate and final decisions implies that information must be triangulated. The traditional approach is to triangulate or compensate within a method. For example, within an OSCE, we compensate information across stations. Yet two stations may have no meaningful relationship with each other (e.g., history-taking and resuscitation) and apples and oranges are being combined. In programmatic assessment aggregation is done across methods towards meaningful entities. For example, information on communication from the OSCE is triangulated with information from a multisource feedback (MSF) and from one or more Mini-CEXs (clinical evaluation exercises). Using such meaningful entities require some overarching framework. This is often found in outcome systems and competency frameworks. They not only provide structure for organizing the curriculum, but also give meaning to the assessment framework. It is important that instruments are structured according the overarching framework. If not, meaningful triangulation will be complicated.
7. Due diligence procedural measures build trust to decision making. When high-stakes decisions are being made, one needs to have trust in the decisions. The decision making on all pooled information cannot be a simple automated process. Often, both quantitative and qualitative information is available and simply averaging is not possible. The inference on the 'picture' requires another expert professional judgement. To make this judgement robust or 'trustworthy', several measures can be taken. The first is to have an appointed committee carrying the responsibility for decision making ([Tweed & Wilkinson, 2019](#)), with committee members being sufficiently independent from learner and mentor. The committee weighs the information, and deliberates to arrive at a well-founded decision. To be resource efficient, this appraisal process should be efficiently organized. The lion's share of the learners will not require much time or deliberation, but some cases do. Then, members of the committee may each prepare some of these cases. Here too, the level of expertise and number of assessors is tailored to the available information. When things are clear, little time investment is required but when things are not, more investment is needed. Ensuring the learner's own mentor is independent will increase trustworthiness of decision making, but also creates a firewall dilemma as the mentor is the one who knows the learner best. On the other hand, knowing that the mentor also decides on their progress may compromise the learner's relationship with their mentor. One compromise is to have mentors provide a recommendation only. This recommendation can be annotated by the learner to increase their agency and enrich the decision-making process with more information. Yet another alternative is that the mentor does not give a judgement at all, but merely confirms that the evidence presented is authentic for the learner.

Many other procedural measures can be taken to improve trustworthiness of the decisions. The size of the committee, the audit trail of the processes and assessment information will matter, as will the degree to which decisions can be justified. Also, the preceding intermediate decisions will play a role because they reduce unpredictability of the final decision. External factors include appeal procedures and the use of standards or milestones. Finally, calibration of the assessors in the committee by training sessions or by discussing exceptional cases afterwards will be important. These are only few of the possible measures for due diligence around the decision-making. Together they will bring trust to essentially what constitutes a human judgement.

Together, these seven pillars support programmatic assessment with its purpose of optimizing both the learning and the decision-making aspects of assessment. Learning is promoted by the focus on feedback, on learner guidance, on growth and development, and on self-directed learning. The decision making is robust because it is based on a multitude of data points, data triangulation, significant expertise of the decision makers and richness in the data. Such information is arguably stronger than a single (even big) examination. Finally, programmatic assessment optimizes curriculum evaluation, including the assessment system. The mentors will have a thorough impression of what happens at any time in the curriculum. As such, they are an excellent source of information for curriculum improvement. We have deliberately used the term 'optimization', and as optimization is almost impossible with a single assessment, programmatic assessment entails a deliberate optimization of the of the whole assessment process.

An example

An example of an existing practice using programmatic assessment may help to understand it better. The Cleveland Clinic Lerner College of Medicine ([Dannefer & Henson, 2007](#)) programme has been in existence for a significant period and many other practices have emerged, both at the undergraduate and postgraduate level and in and outside medicine. But here, we will describe one closest to our own experience: the graduate-entry programme in medicine at Maastricht University.

This graduate-entry programme is a 4-year training programme leading to an MD. On top of this, much attention is paid to research skills which leads to a second degree of Master of Science in clinical research, so in fact it is a 4-year double-degree programme. The curriculum is structured according to the CanMEDS competencies. Didactically, the first year is classic problem-based learning (PBL), the second year is a form of PBL based on real patients, the third year contains clinical rotations and the final year consists of a long-term research participation in the context of a healthcare participation of choice. The students are selected by an multiple mini-interview-type selection procedure and have at least a bachelor degree in one of the biomedical sciences. Expectations are high, and students know they have to work hard to be successful.

The assessment programme consists of module-related assessments and cross-modular longitudinal assessment. Module-related assessments use a multitude of different methods: multiple-choice questions (MCQs), open-ended questions, assignments, projects, (mini) OSCEs, and so on, in the first and second year. Some modules have a series of mini-tests. In the second year, learners write reports on patient cases and oral exams tailoring to the experiences of the individual learner are mostly used. In the last 2 years, an elaborate system of work-based assessment using Mini-CEX, objective structured assessment of technical skill, field notes, and MSF instruments is used. The longitudinal assessment includes a system of progress testing ([Schuwirth & van der Vleuten, 2012](#)). A progress test is a kind of final examination in the cognitive domain. It is a written test (200 MCQs) and includes questions from all disciplines and all organ system categories. The test is administered four times per year to all the students in the curriculum. Of course, junior year students will not be able to answer as many questions as more senior year students, but this is not expected. Every 3 months, a new test is constructed with new items. For students it is almost impossible to strategically revise for the test (which we do not want them to do) because anything could be asked. Instead, regular study activity is rewarded because it typically leads to better scores and less stress. For the assessment of the domain-independent CanMEDS competencies, reliance is put on periodic peer and tutor assessment. The work-based assessment in year 3 and 4 is both module related and longitudinal. Information is carried over from one rotation to the other, as in a continuity of care approach. Professional behaviour is assessed against end-of-graduation performance. All assessment is low stakes; no credit points (in Europe European Credit Transfer System [ECTS] points) are awarded to individual assessments. But all assessment are also

informative, with considerable attention being paid to feedback. Feedback may be in scores and/or in words. For example, the learner may review their own performance on the progress test online either pertaining to an individual test or longitudinally for a series of consecutive tests. This may be done for any type of result (e.g., by discipline, organ system category). Year class performance is also provided to enable the learner to make thorough analyses of their knowledge base while progressing through the curriculum. Spider diagrams are produced summarizing overall performance, and other various kinds of graphical overviews can be generated. A student can easily access the underlying individual data points in these graphs and review the original assessment form which reports all quantitative and qualitative information. In addition, summary overviews of narrative information can be generated. All assessment information and all other relevant material are stored in an e-portfolio by the learner or are generated automatically through the e-portfolio assessment services (e.g., in managing a MSF round).

Every learner is assigned a mentor for the entire period of study of 4 years. This mentor is a regular faculty member who oversees a group of 5 to 10 learners, typically in 2-year groups. The mentor has full access to the e-portfolio and has regular meetings with the learners. Using the portfolio evidence, the students prepare these meetings with reflective reports on their progress, and study plans or learning objectives are made and given follow-up.

At the end of the year the mentor writes a recommendation for promotion to the next year. There is a second information point in that the mentors of the year group go over all portfolios and write a second recommendation for promotion to the independent portfolio assessment committee consists of all mentors. But the student's own mentor has no voting rights in the decision-making over their own learner. When the committee awards a positive judgement for student promotion all credit points are awarded (in our case 60 ECTS per year).

This programmatic approach to assessment has served the programme well. Students become real feedback-seekers and are self-regulated their learning. Results on the progress tests are impressive compared with other medical training programmes (Heeneman et al., 2017). Teachers enjoy working with these students. The mentorship is considered a most rewarding role. Many learners publish their research work and some 50% of the learners continue in a PhD. The graduate entry programme has 50 students per year. We have recently implemented a similar programmatic approach to the much larger undergraduate medical training programme (340 per year).

Conclusion

Programmatic assessment is based on research, but research has to demonstrate if and why it is successful. This research is ongoing. A number of findings have emerged from this research and our experiences so far.



Tip

Programmatic assessment is a major innovation that requires a change management policy.

Changing from a traditional system to a programmatic assessment system is a major change comparable to moving a traditional curriculum to a PBL curriculum. It requires a different mindset of teachers and learners. The prerogative of the individual teacher to fail a learner in the course where the teacher carries responsibility is a deeply rooted tradition. Many universities have university-wide regulations around assessment and grading systems and these can often hamper changes. Like in any other major education change, good change management is essential. Appropriate top-down and bottom-up strategies are essential for making change happen. Leadership is paramount in change management. Faculty training is equally important. Training on the job and just in time are effective ways of helping faculty to change. Exposure to programmes that have successfully made such a change or following a course on programmatic assessment may help the process. Teachers learn in the same way as our learners do. So all our knowledge on how to facilitate learning equally applies to our teachers. Just giving them the information—like with our learners—will not work. Just as PBL can have many manifestations, so might programmatic assessment. Some elements that are easier to implement, or that address a certain need in a particular organization, might create effective hybrids.

Getting the quality of the feedback right is a challenge in programmatic assessment. Feedback requires time and time is always lacking. Providing feedback is also a complex competency which has to be learnt (longitudinally). Longitudinal training of both learners and teachers is essential and in such a training programme feedback on the provided feedback may help.

A recurrent finding is that, in the perception of learners, low-stakes assessment is not so low stakes as intended. Programmatic assessment is also a culture change. Any measure that reduces the 'stick' effect of the assessment is appropriate. This starts with good communication to all stakeholders about the purpose of low-stakes assessment to learners. Some implementations of programmatic assessment have re-take assessment (we have some in our programme). This inherently raises the stakes of the assessment. The same is true for the of grades. The stakes are lower when the learner feels to have more agency on the assessment (Schut et al., 2018).

Programmatic assessment can be applied to any part of the medical training continuum. It seems most naturally fitting to education where experiential learning is important. In experiential learning, noncognitive and complex skills are more important and this probably explains the fit.

Summary

As may be clear, we have not used the standard language that often surrounds assessment. Programmatic assessment provides a different view on assessment than the more conventional psychometric view. This does not mean we are antagonistic to psychometric analysis of the assessments being used. As is clear from [Table 39.1](#) (principle 4) quality assurance is very important to good assessment. Psychometrics sometimes play an important role for that purpose, but they provide one perspective only. There are at least two other perspectives in programmatic assessment. One is an educational view on assessment using all the theoretical notions underpinning learning ([Torre et al., 2020](#)). The purpose is to train qualified professionals in an educationally optimally way. Creating engagement with learners is then essential, by giving them challenging tasks, autonomy, gratifying social relations and personal guidance. Learning should therefore drive assessment instead of the other way around! A second perspective is a qualitative inquiry perspective. Qualitative inquiry has its own methodologic conventions to deal with complexity. We have used many words that stem from this methodology. One could actually say that programmatic assessment is a mixed-method inquiry into a learner's achievements in a training programme using a multitude of quantitative and qualitative sources. It involves giving meaning to an individual person's development in an academic trajectory.

When implemented well, the benefits of programmatic assessment might be large. Especially with competency-based education alignment between assessment and education is important, and we would argue that programmatic assessment provides a better constructive alignment with competency-based education.

References

- Cilliers et al., 2012 Cilliers FJ, Schuwirth LW, Herman N, Adendorff HJ, van der Vleuten CP. A model of the pre-assessment learning effects of summative assessment in medical education. *Advances in Health Sciences Education Theory Practice*. 2012;17:39–53.
- Dannefer and Henson, 2007 Dannefer EF, Henson LC. The portfolio approach to competency-based assessment at the Cleveland Clinic Lerner College of Medicine. *Academic Medicine*. 2007;82:493–502.
- Dijkstra et al., 2012 Dijkstra J, Galbraith R, Hodges BD, et al. Expert validation of fit-for-purpose guidelines for designing programmes of assessment. *BMC Medical Education*. 2012;12:20.
- Heeneman et al., 2017 Heeneman S, Schut S, Donkers J, Van der Vleuten C, Muijtjens A. Embedding of the progress test in an assessment program designed according to the principles of programmatic assessment. *Medical Teacher*. 2017;39:44–52.
- Miller, 1990 Miller GE. The assessment of clinical skills/competence/performance. *Academic Medicine*. 1990;65:S63–67.
- Schut et al., 2018 Schut S, Driessen E, Van Tartwijk J, Van der Vleuten CPM, Heeneman S. Stakes in the eye of the beholder: an international study of learners' perceptions within programmatic assessment. *Medical Education*. 2018;52:654–663.
- Schuwirth and van der Vleuten, 2012 Schuwirth LW, van der Vleuten CP. The use of progress testing. *Perspectives on Medical Education*. 2012;1:24–30.
- Shute, 2008 Shute VJ. Focus on formative feedback. *Review of Educational Research*. 2008;78:153–189.
- Torre et al., 2020 Torre DM, Schuwirth LWT, van der Vleuten CPM. Theoretical considerations on programmatic assessment. *Medical Teacher*. 2020;42:213–220.
- Tweed and Wilkinson, 2019 Tweed M, Wilkinson T. Student progress decision-making in programmatic assessment: can we extrapolate from clinical decision-making and jury decision-making?. *BMC Medical Education*. 2019;19:176.
- Van der Vleuten, 1996 Van der Vleuten CPM. The assessment of professional competence: developments, research and practical implications. *Advances in Health Science Education*. 1996;1:41–67.
- Van der Vleuten et al., 2012 Van der Vleuten CP, Schuwirth LW, Driessen

- EW, et al. A model for programmatic assessment fit for purpose. *Medical Teacher*. 2012;34:205–214.
- Van der Vleuten et al., 2010 Van der Vleuten CP, Schuwirth LW, Scheele F, Driessen EW, Hodges B. The assessment of professional competence: building blocks for theory development. *Best Practice and Research Clinical Obstetrics and Gynaecology*. 2010;24:703–719.
- [Vandewaetere et al., 2015](#) Vandewaetere M, Manhaeve D, Aertgeerts B, Clarebout G, Van Merrienboer JJ, Roex A. 4C/ID in medical education: how to design an educational program based on whole-task learning: AMEE Guide No 93. *Medical Teacher*. 2015;37:4–20.
- [Wrigley et al., 2012](#) Wrigley W, Van der Vleuten CP, Freeman A, Muijtens A. A systemic framework for the progress test: strengths, constraints and issues: AMEE Guide No 71. *Medical Teacher*. 2012;34:683–697.

SECTION 6

Staff

OUTLINE

- 40 The Roles of the Medical Teacher
- 41 The Teacher as a Scholar
- 42 Staff Development
- 43 Mentoring
- 44 Burnout, Mistreatment and Stress
- 45 The Patient as Educator

The Roles of the Medical Teacher

Ronald M Harden and Pat Lilley

Trends

The role of the teacher in medical education has changed in line with:

- The recognition of students as partners with increasing responsibility for their own learning.
- A shift from the teacher as a conduit of information to the teacher as a curator or coach for the student as an information seeker.
- An expectation that the teacher will contribute to the education programme as a professional and as a scholar.

Key concepts

- Civic professionalism: professionalism as it relates to social responsibility, for example climate change, racial discrimination, and gun violence.
- Action research: research, usually carried out by a teacher in relation to a problem encountered in their teaching with a view to improving their teaching practice.
- Test-enhanced learning: increased long-term retention and understanding of the subject through testing, rather than simply repetition.

The changing roles of the medical teacher

Over the past two decades, as described in this textbook, there have been significant changes in medical education; in curriculum planning, in teaching and learning approaches, in assessment techniques, and in educational management. Medical education will continue to evolve in the years ahead.

Not enough attention, however, has been paid to the roles of the teacher and to the impact of the changes on the teacher and their roles. The extent to which developments, such as the flipped classroom, interprofessional learning, and programmatic assessment are a success will depend to a significant extent on how they are applied by the teacher. The teacher is the secret ingredient that determines the extent to which an educational approach is a success or failure.



Tip

The teacher is the decisive element in students' learning.

To a large extent what is expected of a teacher with regard to their responsibilities and role mirrors the many changes that have taken place and continue to take place in medical education. In this chapter, we explore the roles of the teacher using a framework or model that defines the teacher's different roles in the education programme ([Fig. 40.1](#) and [Table 40.1](#)).

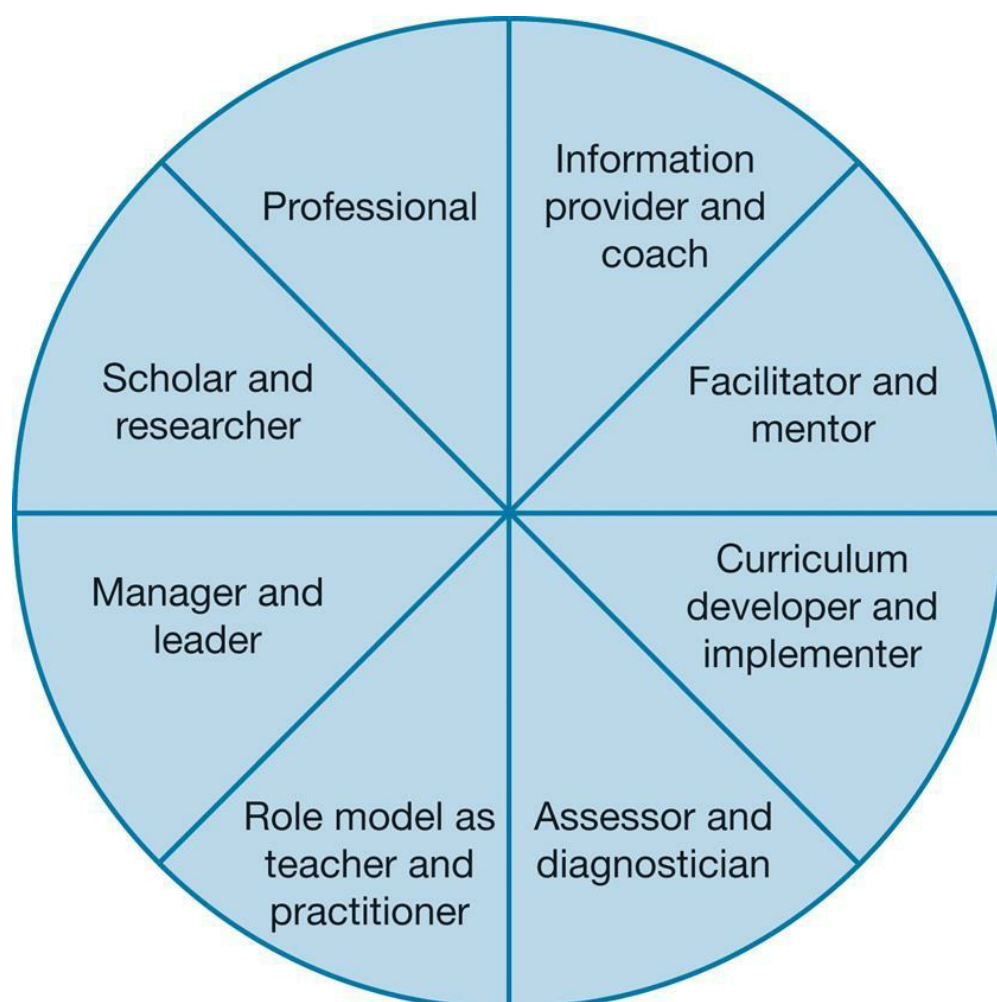


FIG. 40.1 The eight roles of the medical teacher. (From [Harden & Lilley, 2018.](#))

Table 40.1 The eight roles of the medical teacher

| | |
|-------------------------|--|
| 1. Information Provider | <ul style="list-style-type: none"> • Conduit for information • Curator of information • Coach for information seeking |
| 2. Facilitator | <ul style="list-style-type: none"> • Clarification of learning outcomes • Identifying learning opportunities • Making learning effective and efficient • Engaging and motivating the student |
| 3. Curriculum developer | <ul style="list-style-type: none"> • Contributing to the school's curriculum • Planning and implementing personal teaching • Evaluating and planning for change |
| 4. Assessor | <ul style="list-style-type: none"> • Contributing to the school's assessment strategy • Assessing students' progress • Supporting assessment-FOR-learning • Providing feedback to students |
| 5. Role model | <ul style="list-style-type: none"> • Shaping the students' values, attitudes, and behaviours • Developing the students' personal identity |

| | |
|-----------------------|---|
| | <ul style="list-style-type: none"> • Influencing the students' career choice |
| 6. Manager and leader | <ul style="list-style-type: none"> • Engaging with the decision-making process • Managing elements in the curriculum • Providing change leadership and overcoming obstacles |
| 7. Scholar | <ul style="list-style-type: none"> • Identifying what works and does not work • Basing teaching practice on evidence • Innovating and undertaking education research • Sharing teaching experience with others |
| 8. Professional | <ul style="list-style-type: none"> • Personal conduct as a teacher • Inquiring into personal competence as a teacher • Keeping up to date in education • Taking responsibility for personal wellbeing • Demonstrating civic professionalism as a teacher |

The teacher as an information provider and coach

The traditional role of the teacher or lecturer is that of an expert and conduit or transmitter of information to the student. This is achieved through lectures, tutorials, or in the clinical context. Handouts or sets of notes may be used to supplement a lecture. While the excessive use of lectures and the lack of engagement of students in a lecture has been criticised, if properly used, the lecture remains a valuable tool in the teacher's toolkit as described in this text (see [Ch. 9](#)) and by [Harden and Laidlaw \(2020\)](#). The good lecturer engages the student and communicates not only their passion for the subject but a passion for sharing their understanding with students.

Alternative sources of information about a subject, however, are now available online and are easily accessed by the student through their computer, smartphone, or other mobile device. Curation of available information involves the teacher in finding the necessary information, storing it in a logical way, and sharing it with students. As a curator of information, the teacher identifies, evaluates, organizes, and recommends appropriate resources and annotates these, highlighting their relevance to the student.



Tip

Think of the teacher not only as an information conduit but also as a curator of information and as a coach for the student as an information seeker.

Information overload should be recognized by a teacher as a problem. The challenge for the teacher is what should be addressed in the curriculum ([Harden, 2020](#) June blog). With more than 60,000 possible diagnoses, more than 6000 drugs available, and more than 4000 medical and surgical procedures, what is it expected that the student should learn? Naïvely, it is sometimes thought that what has been taught students will have learned, but this may not be the case. Thinking about the threshold concepts to be mastered by a student may be helpful. This is the essential understanding required by the student if they are to move on and proceed ([Neve et al., 2016](#)).

It is no longer possible for a teacher to provide a student with all of the information necessary for a lifetime practice in medicine. New information with important implications for clinical practice will become available. How a doctor assesses a patient, understands their problem, makes a diagnosis, and arranges appropriate management will change with advances in medical science, the development of new drugs and treatment regimes, and with research experience as to what works and what does not work in different contexts.

To address this problem, the teacher must equip the student with the necessary skills and literacy as an information seeker. The student should learn to know what they know and when they do not know, to ask the right question, to explore appropriate

resources to find the answer, and to evaluate the answers received ([Friedman et al., 2016](#)).

The teacher must have the ability and understanding necessary to coach the student in these skills.



“For medical schools the portended changes also suggest a profound faculty development challenge to prepare the current generation of educators with the tools and skills to be effective teachers in a rapidly evolving environment.”

Friedman et al. (2016)

The teacher as a facilitator and mentor

The good teacher is a facilitator of the student's learning. This is reflected in the different roles described in this chapter—as a curriculum developer, an assessor, a role model, a manager, a scholar and a professional. A curriculum map and the specification of the learning outcomes expected of the student on completion of the course provide the student with an overall picture of the curriculum and what is expected of them and facilitates their learning.



Tip

The most important thing you can do as a teacher is to facilitate the students' learning. Think carefully how you can do this most effectively.

The teacher should provide the student with guidance as to the learning opportunities available and how they can engage with them. A study guide, usually in electronic form, is a powerful tool to support the student's learning by advising them at each point in time what they should be learning and the learning opportunities available to support their learning. Self-assessment exercises can be provided with appropriate feedback ([Harden & Laidlaw, 2020](#)).



Tip

Time spent preparing a study guide is time well spent. You share your passion both for the subject and for the students' learning.

The teacher should adopt learning strategies for effective learning as described, for example, in the FAIR principles—the provision of Feedback to the student as to their progress, the adoption of Active rather than passive learning approaches, Individualizing and tailoring the learning to the needs of the individual students, and ensuring that what is learned is Relevant to the students' later practice in medicine.

The teacher as a facilitator of learning should encourage the student to adopt appropriate studying strategies. Reading the same piece of text, or underlining and highlighting key elements, perhaps counterintuitively, is not the most effective approach to learning.

Each student also has their own ambitions and expectations and the teacher should advise the student and support them in planning an appropriate programme of study that achieves their personal ambitions while at the same time addressing the specified learning outcomes for the course.

The teacher as a curriculum developer and implementer

Decisions about a curriculum are frequently the responsibility of a school's curriculum committee. However, as a teacher you also have a measure of responsibility. This includes contributing to the specification of the learning outcomes or competencies expected of the student on completion of the course and to decisions about the educational strategies to be adopted in the curriculum. Where will the school sit on the SPICES model? — a Student-centred or teacher-centred approach, Problem-based or information-based, Integrated or discipline-based, Community- or hospital-based, the use of Electives or a uniform curriculum, and a Systematic approach with specified outcomes and competencies rather than an opportunistic one (Fig. 40.2). You also have a measure of responsibility for the development of an appropriate learning environment and the organization of an assessment process designed to confirm that the student achieves the required standard.



FIG. 40.2 The SPICES Model. (From [Harden & Laidlaw, 2020](#).)



"Teachers should be informed of and have easy access to written learning outcomes for their courses so that they can plan their teaching strategies and methods."

Ramani (2006)

The school's curriculum philosophy and approach should be reflected in your own teaching where you have a responsibility for organizing the learning opportunities available to the students, the content included and the learning outcomes. Your course can contribute to the learning outcomes for the education programme as a whole, for example, through communication and team skills, the development of empathy, and the inculcation of a health promotion and a disease prevention approach to medical practice.

The teacher as an assessor and diagnostician

The teacher has to make decisions as to whether the student has achieved the required learning outcomes before they move on to the next part of the course and whether by the end of the course they have the competencies necessary to serve the patients for whom they will be responsible in practice. The required standard against which a student is judged may be set by a national accrediting body, such as in the United Kingdom, the General Medical Council.

The teacher also has the important responsibility of monitoring the student's progress throughout the education programme, providing feedback to the student as to their achievement and indicating where further work is required. The provision of feedback to the student should be a two-way process involving the teacher and the student and is one of the most powerful things a teacher can do to facilitate learning.

Among the significant changes in assessment is a move from thinking about assessment-OF-learning to assessment-FOR and AS-learning. Assessment can enhance learning. Time spent by students assessing their mastery of a subject may be more rewarding than the equivalent time spent revising what they have already read.



Tip

Ensure that assessment is used not only to assess the students' progress and achievement of the learning outcomes but as an aid to their learning.



"Behind this rather inconspicuous terminology (assessment-FOR-learning) hides nothing short of a revolution in the conceptual framework of assessment."

Schuwirth and van der Vleuten (2011)

Assessment used correctly motivates the student in the right direction in their studies and helps them to focus on what is important. It is essential that assessment is aligned with the expected learning outcomes and the teaching and learning programme. An assessment based mainly on multiple-choice questions (MCQs) will focus the student's efforts on information retrieval, and clinical skills and attitudes may be neglected.

A range of tools is available for student assessment, including written tests, such as MCQs, very short-answer questions, situation judgement tests, performance tools, such as the Objective Structured Clinical Examination (OSCE) and Mini-CEX (clinical evaluation exercise), portfolios, and the use of multisource feedback. The teacher has a particular responsibility in their course for student assessment, including what is assessed, how it is assessed, when it is assessed and the feedback provided to the learner. Assessment decisions about the student's competence should not be based on

data collected at one point in time as a result of one examination, but should involve an evaluation of the student's performance across the course. Programmatic assessment represents a shift from a reliance on an individual assessment to a system of overall assessment of the student across the course.

Assessment of students is perhaps the most challenging role of the teacher with disagreement even among experts as to the merits and implementation of the different approaches. The Ottawa Consensus Statements describe best practice relating to different aspects of assessment, including what makes a good assessment, performance related assessment, technology-enhanced assessment, assessment of professionalism, interprofessional aspects of assessment, programmatic assessment, and selection of students for medical studies (<https://www.ottawaconference.org/>).

The teacher as a role model as teacher and practitioner

Teaching can be seen as an ethical or moral activity. The teacher is expected to model good behaviour and action in their classroom and in their professional practice. The teacher who frequently turns up late or not at all for their teaching session cannot blame students when they also turn up late.

The teacher as a role model is a less obvious or ignored role and is often neglected in staff development programmes. It is, however, one of the most important roles and its impact on the student should not be underestimated. Students model themselves on what they see in practice and not on what they are told to do in a lecture.



Tip

Think of the teacher as a role model from the different perspectives as a teacher, as a doctor or scientist, and as a person.

As a role model, the teacher helps the learner to develop their professional identity and an understanding of the competencies expected of a doctor, including the required professionalism and behaviour.



“The teacher as a role model is not the icing on the cake. It is the cake itself.”

Harden and Laidlaw (2020)

The powerful influence of the teacher on the students' choice of career is well documented. Exposure to role models in a particular clinical field is often associated with a student's choice of career. The learning environment in an education programme is important. Appropriate role modelling can contribute significantly to this. For example, the teacher's behaviour may support an environment where self-assessment is encouraged if they admit their ignorance in an area and their need to learn.

Features of good role modelling have been described ([Box 40.1](#)).

Box 40.1

Features of a good clinical role model

- Good clinical reasoning skills
- Emphasis on a biopsychosocial approach

- Empathy and dedication to the patient
- Enthusiasm for and dedication to their practice and respect for their limits

From Harden & Lilley, 2018.

The teacher as a manager and leader

In an earlier consideration of the roles of the teacher ([Harden & Crosby, 2000](#)), the teacher's role as a manager was not included. The situation, however, has changed over the last two decades and the teacher's role as a manager has now assumed greater importance as a result of fundamental changes in medical education. Such changes include the widespread adoption of integrated teaching, community-based education, self-directed learning, interprofessional education and blended learning. These are all on today's agenda and present significant management challenges.



Tip

Think of the teacher as both a manager and a leader.

Today the teacher increasingly has both an important management and leadership role in the school's education programme. This is necessary if the programme is to evolve and to be both effective and efficient.



"The implementation of an education programme relies on collaboration and teachers working as members of an education team, negotiating and resolving any difficulties and differences of opinion as they occur."

Harden and Laidlaw (2020)

Each teacher should reflect on their role as a manager and leader, in particular in relation to their own teaching responsibilities and how their teaching can be made more effective and efficient.

The teacher as a scholar and researcher

Scholarship and research have been identified in medical education as the province of a small or elite group of teachers actively engaged in research and publishing their work in respected journals. The view today is different. Every teacher is a scholar and they can demonstrate their scholarship in different ways.

As a scholar, the teacher should reflect on their own teaching practice. How does this relate to contemporary views of medical education? What is working and what requires change or upgrade if it is to facilitate more effective student learning?

As a scholar, the teacher approaches their work with an understanding of basic educational principles as illustrated in the FAIR model for effective teaching.

The teacher as a scholar also adopts an evidence-informed approach, basing decisions taken in their teaching practice on the best evidence available. The Best Evidence Medical Education (BEME) guides summarize the evidence available as to best practice in more than 50 areas of medical education (<https://www.bemecollaboration.org/>). The BEME guide on simulation, for example, describes the 10 elements that contribute to the effective use of simulation as a teaching tool in medical education.

The scholarly teacher designs and introduces new approaches to aspects of their work. This may be, for example, a method of engaging students during a lecture or a different type of station in an OSCE.

The scholarly teacher may undertake educational research. This is likely to be action research where they examine aspects of their own teaching. Action research is about diagnosing a problem in a specific area and has the aim of improving teaching practice in some way. Through an understanding of the curriculum from both the students' and the teacher's perspective, the teacher's action research is more likely to have a positive impact on teaching practice. Engaging in action research empowers the teacher and provides the teacher with a greater interest and insight into their work. The teacher may also collaborate in a larger scale education research project.



"Health professions education is enriched when its scientists and scholars take time alone and with others to look beyond today's agenda towards a longer horizon."

McGaghie (2009)

The scholarly teacher accepts the responsibility of sharing their thoughts, wisdom, expertise and experience in medical education with their colleagues and other stakeholders. Work can be shared through publishing their experience and the lessons learned in a medical education journal or by contributing to medical education conferences and meetings where they may give a short presentation of their work or run a workshop where they share their experiences with other conference participants.



Tip

All teachers can be scholars. Teachers for the purpose of promotion and tenure can claim teaching scholarship if they reflect on their own teaching, make evidence-based decisions relating to their teaching, innovate and undertake research in medical education, and communicate about their work and share their experience as a teacher with others.

The teacher as a professional

The teacher demonstrates their professionalism as a teacher in a number of ways (see [Table 40.1](#)). There is an expectation that in addition to their content area of expertise, the teacher will keep themselves up to date in their teaching role. Education has lagged behind medicine in the rate of change but there continue to be significant developments about which a student or teacher should be familiar. An appreciation of developments in medical education can be achieved through texts, such as this book, or through one of the many online or face-to-face courses in medical education. The Association for Medical Education in Europe Essential Skills in Medical Education series of online and face-to-face courses are an example. Continuing professional development of the teacher is important and faculty development is on today's agenda in medical education. The teacher should plan their continuing education in line with their current and future potential roles as a teacher.

In this era of standards and accountability, the teacher as a professional should evaluate their own performance as a teacher. This can be done in a number of ways. It is almost universal practice for students to be asked to evaluate their teaching, with the results available to the teacher and to administrators. The information may be used to inform decisions about promotion, merit, pay rises and teaching awards. As a formative instrument, the data should be used by the teacher to evaluate their own performance. Data from other sources can also be used to provide feedback to the teacher, including peer review and their students' performance in assessment.

Another aspect of professionalism involves the teacher taking responsibility for their own wellbeing. Stress, burnout and mental health problems are not uncommon and interventions such as mindfulness training can help.



"Ethical professionalism in teaching is important at a time of increasing ethical standards and professional accountability in education."

Campbell (2003)

A further and perhaps more controversial aspect of professionalism is civic professionalism. Here the teacher recognizes their social responsibilities as a teacher. Climate change, sustainability, gun violence, and racial discrimination are examples and these can be addressed in the curriculum.

Summary

To be effective, the teacher should have an understanding of their roles as a teacher. The Eight Roles model described in this chapter encourages the teacher to reflect on a teacher's roles and which roles have the greatest importance with regard to their own teaching responsibilities. The different roles draw on the extensive professional skills required of the teacher. The nature of a role may be context-dependent. The teacher's roles are likely to change over time in response to educational change and a school's requirements and in response to a teacher's personal interest and ambition.

Some of the roles described are intuitive whereas others require greater reflection. It is important to raise a teacher's awareness of their roles and the impact these have on a student's learning (Trigwell et al., 2005). In a survey, medical educators defined themselves in the roles of 'professional expert', 'facilitator', 'information provider', 'enthusiast', 'faculty developer', 'mentor', 'undergraduate and postgraduate trainer', 'curriculum developer', 'assessor and assessment creator', and 'researcher' (Nikendei et al., 2016).

Thinking about the roles will help the teacher to consider how they can best contribute to the school's vision and education programme and to the learning of the student.



"Having a shared understanding of what it means to be an effective university teacher forms the basis of ensuring quality."

Devlin and Samarawickrema (2010)

References

- Campbell, 2003 Campbell E. Moral lessons: The ethical role of teachers. *Educational Research and Evaluation*. 2003;9(1):25–50.
- Devlin and Samarawickrema, 2010 Devlin M, Samarawickrema G. The criteria of effective teaching in a changing higher education context. *Higher Education Research and Development*. 2010;29(2):111–124.
- Friedman et al., 2016 Friedman CP, Donaldson KM, Vantsevich AV. Educating medical students in the era of ubiquitous information. *Medical Teacher*. 2016;38(5):504–509.
- Harden, 2020 Harden, R.M. (2020). Investing in our students, what should students learn, as teachers we are not meaningless, and motivation. MedEdWorld. Accessed on 16/6/2020 at: <https://www.mededworld.org/hardens-blog/reflection-items/June-2020/HARDEN-S-BLOG-Investing-in-our-students--What-shou.aspx>.
- Harden and Crosby, 2000 Harden RM, Crosby J. The good teacher is more than a lecturer – the twelve roles of the teacher. *Medical Teacher*. 2000;22(4):334–347.
- Harden and Laidlaw, 2020 Harden RM, Laidlaw JM. *Essential skills for a medical teacher* 3rd Ed. London: Elsevier; 2020.
- Harden and Lilley, 2018 Harden RM, Lilley PM. *The eight roles of the medical teacher* London: Elsevier; 2018.
- McGaghie, 2009 McGaghie WC. Scholarship, publication, and career advancement in health professions education AMEE Guide No 43. *Medical Teacher*. 2009;31(7):574–590.
- Neve et al., 2016 Neve H, Wearn A, Collett T. What are threshold concepts and how can they inform medical education. *Medical Teacher*. 2016;38(8):850–853.
- Nikendei et al., 2016 Nikendei C, Ben-David MF, Mennin S, et al. Medical educators: how they define themselves – results of an international web survey. *Medical Teacher*. 2016;38(7):715–723.
- Ramani, 2006 Ramani S. Twelve tips to promote excellence in medical teaching. *Medical Teacher*. 2006;28(1):19–23.
- Schuwirth and van der Vleuten, 2011 Schuwirth LWT, van der Vleuten CPM. Programmatic assessment: From assessment of learning to assessment for learning. *Medical Teacher*. 2011;33(6):478–485.
- Trigwell et al., 2005 Trigwell K, Prosser M, Ginns P. Phenomenographic

pedagogy and a revised approach to teaching inventory. *Higher Education Research and Development*. 2005;24(4):349–360.

The Teacher as a Scholar

Shoaleh Bigdeli and Fakhrosadat Mirhoseini

Trends

- Accountability, insightfulness, and making the context ready to start the educational scholarly process are prerequisites of becoming a teacher as a scholar.
- Acquiring and enacting the interrelated and integrated behavioural characteristics of a critical inquirer, committedly engaged in actions individual, learning focused individual, critique-based scholar, continuous deep reflector, public sharer, dynamic individual, disciplinary individual, and context-oriented individual are necessary characteristics of a teacher to become a scholar.
- The teacher as a scholar who learns by doing via wisdom of practice, becomes an agent of change in the educational process.

Key concepts

- Discipline: Parker captured the spirit of academic disciplines when, in contrasting the meaning of the terms subject and discipline, she characterized a subject as having a well-developed knowledge base that can be articulated, taught, learned, and assessed, whereas *“a discipline is a more complex structure: to be engaged in a discipline is to shape, and be shaped by the subject, to be part of a scholarly community, to engage with fellow students—to become ‘disciplined’ ”* (Taylor, 2010)
- Context of teaching: *“The discipline, the institution, the community and the state and society in which we practice.”* (Cranton, 2011). It encompasses policies, beliefs, norms, values, culture and subcultures, standards, ethics, leadership perception, collaboration sphere, institutional priorities, human capital, social, financial, intellectual and academic resources that we encounter in the classroom, institute, community of practice, and so on.
- Reflection: “careful thoughts” (Cambridge Dictionary, Online) that are “informed by knowledge gained through personal experience and/or through formal inquiry faculty conduct themselves or read about.” (Kreber, 2006).
- Scholarship of teaching and learning (SoTL): *“SoTL can be defined as a sum of defining attributes that if developed in the process of teaching and learning comprehensively and integratively, it will promote those directly engaged in the educational process and will also direct the process to the level of scholar”*; in other words, it is “a process including a series of scholarly actions in the teaching-learning process that are dynamic, disciplinary, learning focused, critique-based, context-oriented, critically enquiring process, shared publicly, consisting of continuous deep reflection, and committed engagement” in actions (Mirhosseini et al., 2018a; 2018b)

Introduction



"The irony of life is that it is lived forward but understood backward."

Søren Kierkegaard as cited in [Loughran \(2002\)](#)

This chapter presents a practical definition of the teacher as a scholar. It describes the features and strategies that are used by a teacher to promote itself to the status of a teacher scholar as it appears automatically.

If a teacher asks you important questions such as "How could I become a teacher scholar?" or "What are the professional development opportunities that lead a teacher to the status of a teacher scholar?", how do you respond? To begin, we will review the origins and definitions of the word scholar. Then, we offer five intriguing 'WH' questions (Who, When, What, How, Where), responses to which illuminate the way for the teacher transformation to the teacher as a scholar.



"The true teacher as a scholar is knowledgeable, and committed to the values of the academic profession, is courageous, persistent, considerate, humble, honest, committed to continued professional growth, innovative."

[Rudd \(2007\)](#)

"... and is engaged in research and publication."

[Bitzer \(2006\)](#)

"...more, not only a mentor, but a muse."



Tip

A teacher as a scholar is knowledgeable and not only is familiar with theoretical knowledge of his discipline, but also is considerate about knowledge and theory of the disciplines involved in the educational process, and acts accordingly.

The underpinnings of this chapter are the authors' study on scholarship of teaching and learning entitled *Exploring the concept of scholarship of teaching and learning (SoTL): concept analysis* ([Mirhosseini et al., 2018a; 2018b](#)), in which the teacher as a scholar is considered as the consequence of the SoTL process. The study was based on the Walker and Avant methodology ([Walker & Avant, 2011](#)), a qualitative-quantitative approach, in

which 145 articles related to the SoTL were retrieved and analysed. Ultimately, the concept of SoTL was defined applicably on the basis of its antecedents, defining attributes, and consequences one of which is teacher as a scholar. Moreover, the mentioned study emphasizes that SoTL is a process and a continuum that *"is defined as a series of scholarly actions in the teaching-learning process that are dynamic, disciplinary, learning focused, critique-based, context-oriented, critical enquiry process, shared publicly, consisting of continuous deep reflection, and committed engagement in actions."* There are three crucial antecedents for these defining attributes, in the absence of which the SoTL does not occur. The SoTL antecedents include *"responsive teaching, contextual readiness, and insight development."* Moreover, *"the five consequences of the concept are promotion, all-inclusive educational changes, educational enculturation, improved teaching and learning, and wisdom of practice"* under which 'teacher as a scholar' is classified (Mirhosseini et al., 2018a; 2018b).



"The teacher as a scholar is curious about its students and their learning and addresses and explores student learning challenges."

Gayle (2006)

"... brings the most honest and intelligible account of new knowledge to all who will try to learn."

Oppenheimer as cited in Bitzer (2006)

"... and consults the educational and content literature."

Allen and Field (2005), Fincher and Work (2006), Bitzer (2006), Dewar (2008), Wilson-Doenges and Gurung (2013)

In addition, scholarship of teaching and learning is one of the paths of directing teachers to the status of teacher as a scholar, provided that the teacher who is enthusiastic and concerned about his students' learning and their challenges at work, is inquisitive and deeply concerned about teaching and learning, is able to communicate with colleagues of the discipline, is flexible, and ready to extend knowledge. In other words, she/he is a responsible and accountable teacher, who becomes engaged in this process. In this regard, we pose the following 'WH' questions to further understand the teacher as a scholar.

- WHO is the teacher as a scholar?
- WHEN does the informed process of becoming a teacher scholar start and end?
- WHAT are the characteristics of the teacher as a scholar?
- HOW does the process shape the teacher as a scholar? How are the real settings, actions, processes, and so on, that affect and facilitate this process?
- WHERE (in which settings, e.g., classroom, institute, community) does the teacher become a teacher scholar?

Answering the aforementioned questions clarifies the notion of the teacher as a scholar and identifies the practice points by which the teacher could be derived from its ordinary status of a teacher to a teacher as a scholar. Finally, in the conclusion section we will present a definition of a teacher scholar and the chapter will be summarized.

It is worth noting that in this chapter, the terms 'teacher scholar', 'scholar teacher' and 'scholarly teacher' are used interchangeably.

Broadening the definition of teacher scholar/criteria for teacher scholar

History and etymology/origins of the word

Etymologically, the word 'scholar' originates from Old English, scol(i)ere, (schoolchild, student), late Latin scholaris, Latin schola, and Greek skhole⁻ (leisure, philosophy, and lecture-place) (Oxford Learners Dictionary). Literally, the word scholar is defined as "*a person who has done advanced study in a special field*" and "*a learned person*" (Merriam-Webster Dictionary), or "*an intellectual or academic*" (Collins Dictionary).

Scholarship of teaching and learning/the path to become teacher-scholar

The definition presented in the introduction indicates that SoTL is a path to become a teacher as a scholar. According to the Walker and Avant methodology, it could be mentioned that the initial definition of the concept starts with antecedents, followed by defining attributes and coming up with consequences of a concept taking place after the occurrence of its attributes (Walker & Avant, 2011), and in this case, SoTL is a process and a continuum along which the outcomes take shape (Mirhosseini et al., 2018a, 2018b). In other words, it could be implied that the teacher as a scholar, and as an outcome of SoTL, is shaped and promoted along this continuum and is under the influence of all its attributes.



Tip

Becoming engaged in the process of SoTL is one of the paths that transforms a responsible accountable teacher to the status of a teacher as a scholar.

Under the flag of this thought, the authors were inspired by the definition of scholarship of teaching and learning (Mirhosseini et al., 2018a, 2018b), and have provided answers to the following five WH questions (Fig. 41.1. will help you to follow the direction of these questions).

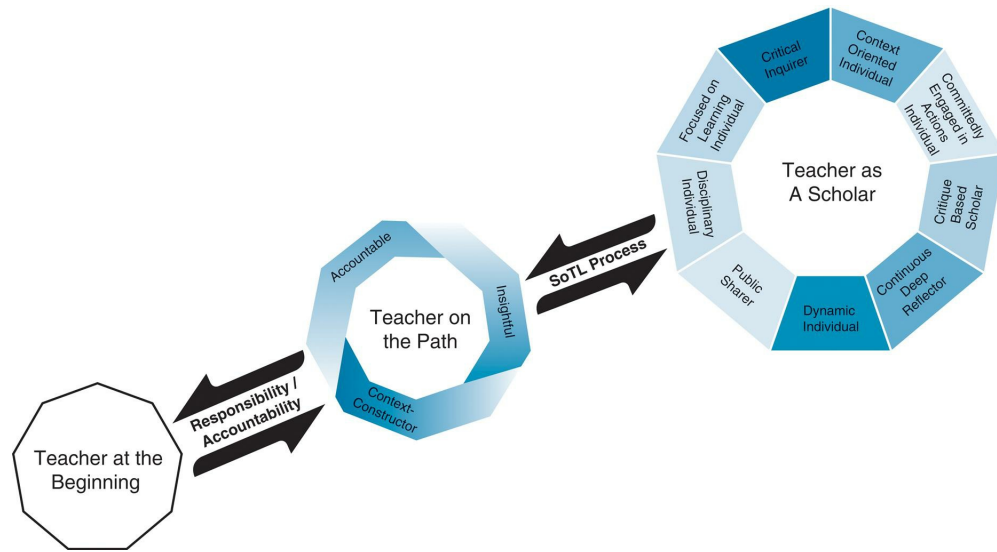


FIG. 41.1 SoTL transformational path from responsible accountable teacher to teacher as a scholar.

WHO is a teacher scholar?

To answer this question, it is expected that the teacher presents a definition of itself when he/she becomes a teacher as a scholar. A teacher scholar is an insightful teacher who is responsible and accountable to the teaching and learning or educational process, prepares himself and the environment to make the educational context ready for the best teaching and learning experience to take place to itself, its students, and other beneficiaries.



Tip

There is a potential scholar inside each accountable teacher.

The teacher enters into the realm of a scholarly process, where he acquires the specific characteristics of the teacher scholar. Eventually, he acquires wisdom of practice and becomes a scholar/teacher scholar who continuously promotes itself, the institute, all beneficiaries, or even knowledge of the discipline.

WHEN does the process of becoming a scholar start and end?

This informed process starts from the time that a teacher becomes insightful and accountable about the educational process, and makes the context of the educational setting ready to move towards being the teacher as a scholar. At this stage, the teacher inquisitively or because of the daily responsibilities of teaching, clinical practice and administrative services, understands the educational problems, and converts them into appropriate major questions and a set of minor ones to be responded.



Tip

The process of becoming a teacher scholar starts from the time that a teacher becomes insightful and accountable about the educational process.

Whenever in the process, the scholarly behaviours are enacted, the teacher becomes a scholar; in other words, when the characteristics of the teacher as a scholar (the answer to the WHAT question) show up in his actions. This time is individualized for each teacher and is the end of the process of becoming a teacher as a scholar. Since then, he is a teacher as a scholar capable to promote the quality of these behavioural characteristics, provided that there is a will (he wants and desires to).

These characteristics will be acquired along the scholarly educational process (the answer to the HOW question).

More, there are some factors that affect the ending point of this process, which worth further research; for example, teacher personality traits, experiences, working conditions, and so on.

WHAT are the characteristics of the teacher as a scholar? (see [Fig. 41.1](#)).

In this part, inspired from the defining attributes of SoTL ([Mirhosseini et al., 2018a, 2018b](#)), the integrated and inseparable characteristics of a scholar teacher will be explored.

1 Critical inquirer

The teacher as a scholar considers all aspects of educational process critically, and is an inquisitive inquirer who uses the best evidence and virtue-based strategies iteratively to promote the educational process.

2 Committedly engaged in actions individual

The teacher as a scholar is innovatively, deeply and committedly engaged in the actions of an educational scholarly process, and is ethically committed to the profession.

3 Focused on learning individual

All through the educational scholarly process, from the very beginning to the end, the teacher as a scholar is focused on learning of his self, his students and other beneficiaries.

4 Critique-based scholar

Through the educational scholarly process, whenever there are climaxes, he designs and redesigns the process and implements his understandings of the critical reviews of others and his experiences and achievements.

5 Continuous deep reflector

Before, during and after the end of the educational scholarly process, he is skilfully attuned to continuous deep reflection by itself, a peer/s or in a group.

6 Public sharer

Purposefully and precisely documents and disseminates his beliefs, values, scholarly actions, measures, beliefs, etc. with all beneficiaries to receive their criticisms and encourage them to build upon them; moreover, he builds his future actions on the reviews and critics of the other beneficiaries.

7 Dynamic individual

Continuously and productively realizes that the educational process is dynamic, developmental and systematic.

8 Disciplinary individual

The teacher as a scholar is knowledgeable and not only is familiar with theoretical knowledge of his discipline ([Chick, 2019](#)), but also is considerate about knowledge and theory of other disciplines involved in the educational process. His measures are originated from and based on the needs, priorities, standards, knowledge, and approval of the discipline.

9 Context-oriented individual

The teacher as a scholar is institution-oriented, context and community-based, and beneficiary-oriented.

HOW does the process shape the teacher as a scholar?

In this section, actions, deeds and behaviours that happen during the iterative scholarly educational process, according to the features of the teacher as a scholar, are presented.

1 Critical inquirer

The teacher who wants to be a scholar, after encountering the educational problems and realizing and considering the best evidence, institute, peers ([Felten & Chick, 2018](#)), other beneficiaries, etc. defines his enquiry/inquiry framework in a direct, systematic, critical, researchable, and reflective manner; follows a systematic, deep, and continuous enquiry/inquiry process in all steps of his scholarly activities; clarifies the educational key questions; relates the questions to each other; relies on concise and precise information to achieve the best evidence; applies the best evidence and virtue-based strategies iteratively; considers, at least, the elements of teacher, learner, and subject in educational enquiry/inquiry ([Hutchings & Huber, 2008](#)).

2 Committedly engaged individual

Is enthusiastic and effectively passes through different stages of the educational process deeply and committedly; creates a new appropriate learning environment and experience for himself and others, and immensely enjoys its creation; considers his individual beliefs while collaborating with other beneficiaries in a flexible condition; is goal-oriented; selects and applies appropriate tools and methods to answer the educational questions; carefully observes related activities and actions; provides innovative measures; is ethical; is committed to self-improvement, environmental growth, feedback loop, and all the elements of the educational process; implements the results; produces new knowledge from pedagogic activities; acts dynamically and iteratively; acquires the required competencies; is committed to environmental growth; is committed and skilfully attuned to fulfil all the characteristics in his actions; for example, continuous deep reflection (by itself or in a group), before and from the beginning to and after the end of the process, etc.



"The teacher as a scholar knows and utilizes effective teaching methodology, learns new techniques and increases his or her knowledge base and learning over time."

Wilson-Doenges and Gurung (2013)

3 Focused on learning individual

Is a life-long learner; provides life-long learning opportunity for himself, his students, and other beneficiaries; becomes aware of the benefits of the institute, beneficiaries and society and acts accordingly; increases his knowledge via learning by doing; engages himself in a transformative learning process; applies instructional design by integrating and relating teaching and learning; dynamically and continuously keeps all beneficiaries active along the process.

4 Critique-based individual

Designs a criticizable process whenever there is a need to make critical decisions; provides review and critique through a developmental iterative loop; seeks feedback and review from his colleagues/peers and students, and so on; ensures that the actions are accurate and progressive.

5 Continuous deep reflector

Thinks and reflects deeply and continuously in or on the educational process by one's self or in a group; reflects on himself as a component of the educational process; makes reflections on his actions and the elements of the educational process, such as ethical considerations, teaching experience, validated knowledge construction process, etc. according to his personality traits; documents, shares and publicizes his reflections in

his portfolio ([Kreber, 2006](#)).

6 Public sharer

Precisely documents his actions and findings to transfer knowledge and receive critics; shares his goal-oriented findings based on the highest number of resources and protocols to attract collaboration of learners, all stakeholders, and so on; encourages others to criticize and build upon his knowledge; provides easy access to his findings and shares information; shares the new knowledge ([Felten & Chick, 2018](#)) to promote knowledge and learning in all beneficiaries; develops a precise portfolio, including evidences and documents of SoTL in an ongoing process.

7 Dynamic individual

Considers continuous educational process; considers priorities and mutual support of the educational process elements; considers informed intentional changes; evaluates the educational process continuously and developmentally; bases his activities on his previous deeds; is engaged in developmental growth; has a continuous dialogue while applying valid and reliable tools to encourage others; focuses on team dynamic and leadership skills to promote faculty engagement ([Happel et al., 2020](#)); considers the synoptic capacity 'to place what is known in context and open the way for connection to be made between the knower and the known' (Rice Typology as cited in [Badley, 2003](#)); promotes on a continuous basis.

8 Disciplinary individual

Is competent in mastering knowledge of the involved discipline and knows how to promote it ([Bitzer, 2006](#)); facilitates communication of different involved disciplines during the educational process; conducts the disciplinary processes; has an acceptable impact on his discipline, and uses the results of his actions and deeds to improve teaching.

9 Context-oriented individual

Considers and respects the policies, rules and regulations, assumptions, beliefs, values ([Felten & Chick, 2018](#)), norms and politicosocietal processes, procedures, and ethical concerns of the institute as the starting point; recognizes the needs, wants and desires of stakeholders and the community of practice and interacts with them appropriately; develops and promotes a community of scholars collaborates in educational culture-building in the institute in which he works and provides comprehensive changes in the educational process; recognizes the context for appropriate actions, according to the nature of its characteristics and prepares it accordingly.

WHERE does the SoTL process occur?

This is a crucial question about WHERE all the mentioned actions and behaviours take place to transform a teacher to teacher as a scholar. It is obvious that the context of

educational process is wider than classroom, and is in the community of practice and society. On the basis of the needs, demands and desires, there is a need for accountability.

On the other hand, the nature of the characteristics mentioned for teacher as a scholar identifies the context in which (WHERE) they might occur. For example, if there is a need for group review and reflections, and dissemination of the elements of the scholarly process outside the classroom, the teacher as a scholar should have a plan to implement necessary actions to respond to the needs of the beneficiaries at different levels of educational department, institute, professional community and the community beyond the profession.

According to the aforementioned points, teacher scholar is defined as (see [Fig. 41.1](#)):

“an insightful teacher who is responsible and accountable to the teaching and learning or educational process, prepares itself and the environment to make the educational context ready for the best teaching and learning experience for itself, his students, and other beneficiaries, enters into the realm of a scholarly process, during which acquires the nine interrelated and integrated characteristics of the teacher scholar (such as critical inquirer, committedly engaged in actions individual, learning focused individual, critique-based scholar, continuous deep reflector, public sharer, dynamic individual, disciplinary individual, and context-oriented individual). Eventually, the teacher acquires wisdom of practice and becomes a scholar/teacher scholar who continuously promotes itself, the institute, and all beneficiaries, or even knowledge of the discipline.”

Summary

In the recent years, medical universities are convinced to consider different roles for a medical teacher and the importance of transforming the teacher to the status of teacher as a scholar has become the focus of attention. In this chapter, we focused on the characteristics of a teacher as a scholar and asked, strong vibrant WH questions (who, when, what, how and where) and answers to explain the indicators of progress from the position of an insightful, accountable teacher to the status of a teacher as a scholar.

Inherent in our suggestions were principles that could shape the 'teacher-teacher as a scholar continuum' (see [Fig. 41.1](#)) via an educational scholarly process. It is worth saying that educational process occurs beyond the classrooms in the institute, professional society, inter-professions and the society beyond the profession on the basis of the societal needs, in an accountable fashion. In addition, group critics and reflections that are required for measures and actions to be taken, indicate that according to the nature of SoTL features, it is closely related to societal needs and values and all the beneficiaries. It is important that individual and institutional policies promote teachers accountability, and ensure that the teacher will become a teacher as a scholar and an agent of change.

References

- Allen and Field, 2005 Allen MN, Field PA. Scholarly teaching and scholarship of teaching: noting the difference. *International Journal of Nursing Education Scholarship*. 2005;2(1):14.
- Badley, 2003 Badley G. Improving the Scholarship of Teaching and Learning. *Innovations in Education and Teaching International*. 2003;40(3):303–309.
- Bitzer, 2006 Bitzer ME. Restoring the status of teaching scholarship at a research orientated university. *South African Journal of Higher Education*. 2006;20(4):372–390.
- Chick, 2019 Chick N. Theory and the scholarship of teaching and learning: inquiry and practice with intention. In: Mallon M, Hays L, Bradley C, Huisman R, Belanger J, eds. *The grounded instruction librarian: participating in the scholarship of teaching and learning*. Atlanta, GA: ALA; 2019;55–64.
- Cranton, 2011 Cranton P. A transformative perspective on the scholarship of teaching and learning. *Higher Education Research and Development*. 2011;30(1):75–86.
- Dewar, 2008 Dewar JM. An apology for the scholarship of teaching and learning. *InSight: A Journal of Scholarly Teaching*. 2008;3:17–22.
- Felten and Chick, 2018 Felten P, Chick N. Is SoTL a signature pedagogy of educational development?. *To Improve the Academy*. 2018;37.
- Fincher and Work, 2006 Fincher RME, Work JA. Perspectives on the scholarship of teaching. *Medical Education*. 2006;40(4):293–295.
- Gayle, 2006 Gayle BM. The contributions of the scholarship of teaching and learning. *Classroom Communication and Instructional Processes: Advances through Meta-Analysis* 2006;361–377.
- Happel et al., 2020 Happel C, Claudia A, Song X. Facilitators and barriers to engagement and effective SoTL research collaborations in faculty learning communities. *Teaching & Learning Inquiry*. 2020;8(2):53–72 <http://dx.doi.org/10.20343/teachlearningqu.8.2.5>.
- Hutchings and Huber, 2008 Hutchings P, Huber MT. Placing theory in the scholarship of teaching and learning *Arts and Humanities in Higher Education: An International Journal of Theory. Research and Practice*. 2008;7(3):229–244.
- Kreber, 2006 Kreber C. Developing the scholarship of teaching through transformative learning. *Journal of Scholarship of Teaching and*

- Learning*. 2006;6(1):88–109.
- [Loughran, 2002](#) Loughran J. Effective reflective practice: in search of meaning in learning about teaching. *Journal of Teacher Education*. 2002;53:33.
- Mirhosseini et al., 2018a Mirhosseini F, Mehrdad N, Bigdeli Sh, Peyravi H, Khoddam H. *To develop an applied model of scholarship of teaching and learning for Iranian Universities of Medical Sciences, thesis submitted for partial fulfilment of the requirements of the PhD degree* Tehran, Iran: Tehran University of Medical Sciences; 2018a.
- Mirhosseini et al., 2018b Mirhosseini F, Mehrdad N, Bigdeli Sh, Peyravi H, Khoddam H. Exploring the concept of scholarship of teaching and learning (SoTL): concept analysis. *Medical Journal of the Islamic Republic of Iran*. 2018b;32:96.
- [Rudd, 2007](#) Rudd RD. What is the scholarship of teaching and learning?. *NACTA Journal*. 2007;49(4):2–4.
- Rust, 2007 Rust C. Towards a scholarship of assessment. *Assessment & Evaluation in Higher Education*. 2007;32(2):229–237.
- [Taylor, 2010](#) Taylor LK. Understanding the disciplines within the context of educational development. *New Directions for Teaching and Learning*. 2010;122:59–67.
- Walker and Avant, 2011 Walker LO, Avant KC. *Strategies for theory construction in nursing* 5th Edition Boston: Pearson; 2011.
- Wilson-Doenges and Gurung, 2013 Wilson-Doenges G, Gurung RA. Benchmarks for scholarly investigations of teaching and learning. *Australian Journal of Psychology*. 2013;65(1):63–70.

Online resources

cambridge

<https://dictionary.cambridge.org/dictionary/english/reflection>.

merriam-webster <https://www.merriam-webster.com/dictionary/scholar>.

Oxford Learners Dictionary

<https://www.oxfordlearnersdictionaries.com/definition/English/scholar>

merriam-webster <https://www.collinsdictionary.com>.

Staff Development

Yvonne Steinert

Trends

- Staff development is a critical component in promoting innovation and excellence in medical education.
- Longitudinal programmes, which have increased in prominence in the last decade, yield broader and more sustainable outcomes.
- Learning in the workplace – and belonging to a community of practice – should be recognized as an important aspect of staff development.
- Mentorship plays a key role in the successful development of medical teachers.
- To maximize its benefits, staff development should focus on organizational change and development.

Key concepts

- Staff development: refers to *“all activities that health professionals pursue to improve their knowledge, skills and behaviours as teachers and educators, leaders and managers, and researchers and scholars, in both individual and group settings”* ([Steinert, 2014](#)).
- Community of practice: a *“persistent, sustaining, social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise”* ([Barab et al., 2002](#)).

Introduction

Staff development, or faculty development as it is often called, has become an increasingly important component of medical education. Staff development activities have been designed to improve teacher effectiveness at all levels of the educational continuum (e.g., undergraduate, postgraduate and continuing medical education) and diverse programmes have been offered to healthcare professionals in many settings.

Staff development refers to all activities that health professionals pursue to improve their knowledge, skills and behaviours as teachers and educators, leaders and managers, and researchers and scholars, in both individual and group settings (Steinert, 2014). Moreover, staff development, which can include both formal (e.g., workshops or seminars) and informal (e.g., learning in the workplace) approaches, can also serve as a useful instrument in the promotion of organizational (or cultural) change. In diverse ways, the goals of staff development are to renew or assist faculty members in their roles, to teach medical teachers the skills relevant to their institutional and faculty position, and to sustain their vitality, both now and in the future.

Although a comprehensive staff development programme includes attention to all faculty roles, as highlighted earlier, the focus of this chapter will be on staff development for teaching improvement.



"The one task that is distinctively related to being a faculty member is teaching; all other tasks can be pursued in other settings; and yet, paradoxically, the central responsibility of faculty members is typically the one for which they are least prepared."

Jason and Westberg (1982)

Common practices and challenges

Knowledge of key content areas, educational approaches, frequently encountered challenges and programme effectiveness can help to guide the design and delivery of innovative staff development programmes.

Key content areas

The majority of staff development programmes focus on teaching improvement (in the classroom and the clinical setting), the acquisition of specific teaching skills, instructional design, educational leadership, and educational scholarship (Steinert et al., 2016). They also address teaching conceptions and learning approaches, as well as specific core competencies (e.g., the teaching and evaluation of professionalism), emerging educational priorities (e.g., social accountability), curriculum design and development (e.g., competency-based education) and the use of technology in teaching and learning. In fact, many of the chapters in this book could easily become the focus of a staff development programme.

At the same time, less attention has been paid to staff development in the areas of assessment and evaluation of learners and programmes, the personal development of healthcare professionals, educational leadership and scholarship, and organizational development. Although instructional effectiveness at the individual level is critically important, a more comprehensive approach to staff development should be considered. That is, staff development programmes need to develop individuals who will be able to provide educational leadership, act as educational mentors, and design and deliver innovative educational curricula.

The identity of faculty members and medical teachers should also be addressed by staff development programmes, as bolstering clinicians' identities as teachers can help them feel valued, pursue educational activities, and participate in faculty development offerings (Steinert et al., 2019). In addition, staff development has a significant role to play in promoting teaching as a scholarly activity and in creating an educational climate that encourages and rewards educational leadership, innovation and excellence.



"Faculty development is not a luxury, it is an imperative for every medical school."

McLean et al. (2008)

Lastly, staff development programmes need to target the organizational culture in which teachers work in order for them to be successful. As an example, staff development can help to develop institutional policies that support and reward excellence in teaching, encourage a reexamination of criteria for academic promotion, recognize educational innovation and scholarship, and create networking opportunities for faculty members. Innovative programming can also support and promote visible

career paths for teachers and educators and help to bring about culture change.

Educational approaches

The most common staff development approaches include workshops and short courses, fellowships and other longitudinal programmes (Steinert et al., 2016). Workshops are one of the most popular formats because of their inherent flexibility and promotion of active learning. In fact, faculty members value a variety of teaching methods within this format, including interactive lectures, small-group discussions, individual exercises, role plays and simulations, and experiential learning. Longitudinal programmes typically consist of multiple components, including university courses, monthly seminars, independent projects and participation in a variety of staff development activities, and they have particular appeal because teachers can continue to practice and teach while improving their educational knowledge and skills. Longitudinal programmes also have the ability to enhance educational leadership and scholarship while promoting a sense of community among programme participants.

At the same time, given the everchanging needs and priorities of medical schools and healthcare professionals, as well as the way in which health professionals learn, a variety of other approaches for staff development (e.g., decentralized activities, learning in the workplace) should be considered. Importantly, staff development can occur along two dimensions as illustrated in Fig. 42.1: from individual (independent) experiences to group (collective) learning, and from informal approaches to more formal ones (Steinert, 2010). Many healthcare professionals learn through experience, by ‘doing’ and reflecting on that experience; others learn from peer or student feedback, while work-based learning and belonging to a community of practice is critically important for others. Although the medical school (as an institution) is primarily responsible for the organization of more formal (structured) activities, powerful learning can occur in informal settings, most notably in the workplace.

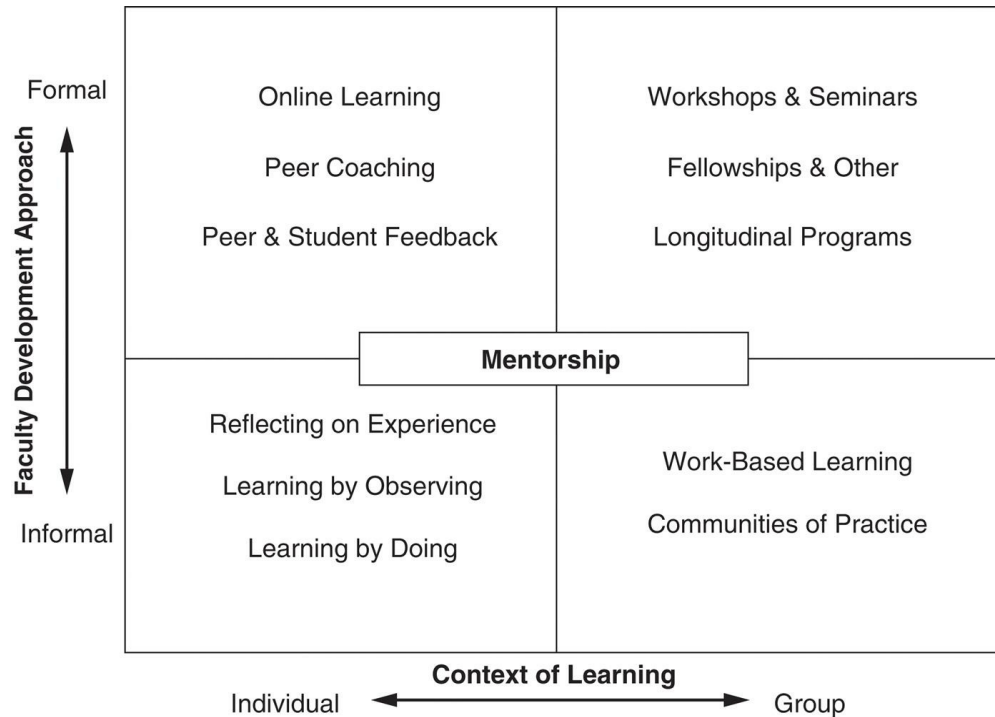


FIG. 42.1 Approaches to faculty development (Figure originally prepared for a chapter on 'Becoming a better teacher: from intuition to intent' (Steinert, 2010). Reprinted with permission by the American College of Physicians © 2010).



"The greatest difficulty in life is to make knowledge effective, to convert it into practical wisdom."

Sir William Osler

Decentralized activities

Staff development programmes are often departmentally based or centrally organized (i.e., faculty wide). Given the increasing reliance on community preceptors and ambulatory sites for teaching, staff development programmes should be 'exported' outside of the academic setting. Decentralized, site-specific activities have the added advantage of reaching individuals who may not otherwise attend organized activities and can help to develop a departmental culture of self-improvement.

Self-directed learning

Self-directed learning initiatives are not frequently described in the staff development literature. However, there is a clear place for self-directed learning that promotes 'reflection in action' and 'reflection on action', skills that are critical to effective teaching and learning (Schön, 1983). Whenever possible, teachers should be encouraged to determine their own needs through self-reflection, student evaluation and peer feedback, and they should participate actively in the design of their own development.

Self-directed learning activities have been used extensively in continuing medical education; staff development programmes should build on these experiences.

Peer coaching

Peer coaching has been described extensively as a method of faculty development in the educational literature. Key elements of peer coaching include the identification of individual learning goals (e.g., improving specific teaching skills), focused observation of teaching by colleagues, and the provision of feedback, analysis and support (Flynn et al., 1994). This underused approach, sometimes called co-teaching or peer observation, has particular appeal because it occurs in the teacher's own practice setting, enables individualized learning and fosters collaboration. It also allows healthcare professionals to learn about each other as they teach together, helping to promote interprofessional education and practice.

Online learning

Online learning and computer-aided instruction is closely tied to self-directed learning. As time for professional development is limited, and the technology to create interactive instructional programmes is now in place, the use of online staff development should be explored in greater depth. In many ways, online resources (e.g., Chan et al., 2015) can be considered supplements to centrally organized activities as they enable individualized learning targeting specific needs (Cook & Steinert, 2013); they can also be used in a 'staged approach', later in the development of medical teachers, as long as we do not lose sight of the value and importance of working in context, with our colleagues.

Mentorship

Mentoring is a common strategy to promote the socialization, development and maturation of academic medical faculty (Bland et al., 1990). It is also a valuable, but underused, staff development strategy. Mentors can provide guidance, direction, support or expertise to faculty members on a range of topics, in a variety of settings. They can also help teachers to understand the organizational culture in which they are working and introduce them to invaluable professional networks (Schor et al., 2011). In fact, medical teachers often report that finding a mentor (and being mentored) is critical to personal and academic success; effective mentorship has also been shown to increase career satisfaction and reduce faculty burnout (Boillat & Elizov, 2014). Daloz (1986) has described a mentorship model that balances three key elements: support, challenge and a vision of the individual's future career. This model can serve as a helpful framework. The value of role models and mentors has been highlighted since Osler's time, and we should not forget the benefits of this method of professional development despite new technologies and methodologies.



"[Mentorship as a faculty development strategy] implies the development of the faculty member in the broader sense, taking the faculty member as a whole person whose

personal and professional lives are intertwined and inseparable..."

Boillat and Elizov (2014)

Learning in the workplace

The role of informal learning in the workplace is integral to staff development. In fact, it is in the everyday workplace, where teachers conduct their clinical, teaching and research activities, that learning most often takes place (Swanwick, 2008). It is surprising, therefore that work-based learning is not seen as a common venue for staff development, for it is through teaching in hospital or community settings that teachers acquire new knowledge and refine their approaches to teaching and learning. Staff development activities have traditionally been conducted away from teachers' workplaces, requiring participants to take their 'lessons learned' back to their own contexts. It is time to reverse this trend and think about how learning that takes place in authentic settings can be enhanced; there is also value in rendering this learning as visible as possible so that it can be recognized as an important component of staff development. A pedagogy of the workplace includes individual engagement, sequencing of activities to create pathways for learning, the provision of guidance to promote learning, environmental affordances which enable access to learning, and reflection and role modelling (Billett, 2002); these characteristics also describe key features of staff development.

Closely related to work-based learning is the notion of a community of practice. Barab and colleagues (Barab et al., 2002) have defined a community of practice as a "persistent, sustaining, social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise." In many ways, becoming a member of a teaching community can be viewed as an approach to faculty development, and ways to make this community – and the learning that it offers – more accessible to medical teachers should be explored.



"Communities of practice for faculty development offer an effective and sustainable approach for knowledge management and implementation of best practices."

de Carvalho-Filho et al. (2020)

Frequently encountered challenges

Staff development programmes cannot be designed or delivered in isolation from other factors that include institutional support, organizational goals and priorities, resources for programme planning, and individual needs and expectations. Common challenges faced by faculty developers include defining goals and priorities; balancing individual and organizational needs; motivating faculty to participate in staff development initiatives; obtaining institutional support and 'buy in'; promoting a 'culture change'

that reflects renewed interest in teaching and learning; and overcoming limited human and financial resources. As motivating faculty to participate in staff development is a key challenge, it will be discussed in greater detail.

Teachers differ from students and residents in a number of ways. They have more life experiences, they have more self-entrenched behaviours and change may be seen as a greater threat. In addition, motivation for learning cannot be assumed and time for learning is not routinely allocated. Staff development programmes must address these challenges. Teachers do *not* participate in staff development activities for a variety of reasons. Some do not view teaching – or teaching improvement – as important; others do not perceive a need for improvement or feel that their institution does not support or value these activities. Many are not aware of the benefits (or availability) of staff development. Cognizance of these factors in programme planning can be very helpful.

To motivate faculty, one should develop a culture that promotes and encourages professional development, consider multiple approaches to achieving the same goal, tailor programmes to meet individual and organizational needs, and ensure relevant and ‘high-quality’ activities. One must also build a network of interested individuals, encourage the dissemination of information, use student feedback to illustrate need, recognize participation in staff development and, if possible, provide ‘release time’. Whenever possible, it is also helpful to link staff development activities with ongoing programmes (e.g., hospital rounds, continuing medical education events), to provide a range of activities and methods of learning, and to offer free and flexible programming. Organizational support for staff development is also critical, as are strategies that target organizational norms and values.



“The goal of faculty development is to empower faculty members to excel in their role as educators and, in so doing, to create organizations that encourage and reward continual learning.”

Wilkerson and Irby (1998)

Programme effectiveness

Despite numerous descriptions of staff development programmes, there has been a paucity of research demonstrating the effectiveness of most activities (Steinert et al., 2016). Few programmes have conducted comprehensive evaluations to ascertain what effect programmes are having on faculty members, and data to support the efficacy of these initiatives have been lacking. Of the studies that have been conducted in this area, most have assessed participant satisfaction; some have explored changes in cognitive learning or performance, and several have examined the long-term impact of these interventions.

Despite methodologic limitations, we do know that staff development activities have been rated highly by participants and that teachers regard the experience as useful, recommending participation to their colleagues. A number of studies have also

demonstrated an impact on teachers' knowledge, skills and attitudes, and several have shown changes in student behaviour as a result of faculty participation in staff development programmes (Steinert et al., 2016). Other benefits have included increased personal interest and enthusiasm, improved self-confidence, a greater sense of belonging to a community and educational leadership and innovation (Steinert et al., 2003).



"My view of myself as a teacher has changed, from an information provider to a 'director' of learning."

McGill Teaching Scholar

The challenge in this area is to conduct more rigorous evaluations of staff development initiatives from the outset, to consider diverse models of programme evaluation, to make use of qualitative research methods, and to broaden the focus of the evaluation itself. In no other area is the need to collaborate or transcend disciplinary boundaries greater.

Designing a staff development programme

The following guidelines are intended to help individuals design and deliver effective staff development programmes. They are also based on the premise that the medical school has a critical role to play in providing institutional leadership, appropriate resource allocation, and recognition of teaching excellence ([McLean et al., 2008](#)).

Understand the institutional/organizational culture

Staff development programmes take place within the context of a specific institution or organization. It is imperative to understand the culture of that institution and be responsive to its needs. Staff developers should capitalize on the organization's strengths and work with the leadership to ensure success. In many ways, the cultural context can be used to promote or enhance staff development efforts. For example, staff development during times of educational or curricular reform can take on added importance ([Rubeck & Witzke, 1998](#)). It is also important to assess institutional support for staff development activities and lobby effectively. Staff development cannot occur in a vacuum.



Tip

Capitalize on the institution's strengths and promote organizational change and development.

Determine appropriate goals and priorities

As with the design of any other programme, it is imperative to clearly define goals and priorities. What is the programme trying to achieve – and why is it important to do so? Carefully determining goals and objectives will influence the choice of activity, programme content and methodology. Moreover, although determining priorities is not always easy, it is essential to balance individual and organizational needs.



Tip

Consider the multiple roles medical teachers play, including that of coach and mentor.

Conduct needs assessments to ensure relevant programming

As stated earlier, staff development programmes should base themselves on the needs of the individual, as well as the institution. Student needs, patient needs and societal needs may also help to direct relevant activities. Assessing needs is necessary to refine goals, determine content, identify preferred learning formats and assure relevance. It is also a way of promoting early 'buy in'. Common methods include written questionnaires or surveys, interviews or focus groups with key informants (e.g., participants, students, educational leaders), observations of teachers 'in action', literature reviews and environmental scans of available programmes and resources. Whenever possible, it is worth acquiring information from multiple sources and distinguishing between 'needs' and 'wants'. Clearly, an individual teacher's perceived needs may differ from those expressed by their students or peers. Needs assessments can also help to further translate goals into objectives, which will serve as the basis for programme planning and evaluation of outcome.



Tip

Assess needs to refine goals, determine content, identify preferred learning formats and promote 'buy in'.

Develop different programmes to accommodate diverse needs

Different educational formats and approaches have been described in an earlier section. Clearly, medical schools must design programmes that accommodate diverse goals and

objectives, content areas, and the needs of the individual and organization. For example, if the goal is to improve faculty members' lecturing skills, a half-day workshop on interactive lecturing might be the programme of choice. On the other hand, if the goal is to promote educational leadership and scholarly activity among peers, a Teaching Scholars Programme (e.g., [Steinert et al., 2003](#)) or educational fellowship might be the preferred format. In this context, it is also helpful to remember that staff development can include development, orientation, recognition and support, and different programmes are required to accommodate diverse objectives. Programme content and methods must also change over time to adapt to evolving needs.

Incorporate principles of adult learning and instructional design

Adults come to learning situations with a variety of motivations and expectations about teaching methods and goals. Key principles of adult learning (e.g., [Knowles, 1980](#)) include the following:

- Adults are independent.
- Adults come to learning situations with a variety of motivations and expectations about particular learning goals and teaching methods.
- Adults demonstrate different learning styles.
- Much of adult learning is 'relearning' rather than new learning.
- Adult learning often involves changes in attitudes as well as skills.
- Most adults prefer to learn through experience.
- Incentives for adult learning usually come from within the individual.
- Feedback is usually more important than tests and evaluations.

Incorporation of these principles into the design of a staff development programme can enhance receptivity, relevance and engagement. In fact, these principles should guide the development of all programmes, irrespective of their focus or format, as physicians and other healthcare professionals demonstrate a high degree of self-direction. They also possess numerous experiences that should serve as the basis for learning.



Tip

Incorporate principles of adult learning to enhance receptivity, relevance and engagement.

Principles of instructional design should also be followed. For example, it is important to develop clear learning goals and objectives, identify key content areas, design appropriate teaching and learning strategies and create appropriate methods of

evaluation (of both the students and the curriculum) (Fig. 42.2). It is equally important to integrate theory with practice and to ensure that the learning is perceived as relevant to the work setting and to the profession. Learning should be interactive, participatory and experientially based, using the participants' previous learning and experience as a starting point, and a positive environment for learning should be maintained.

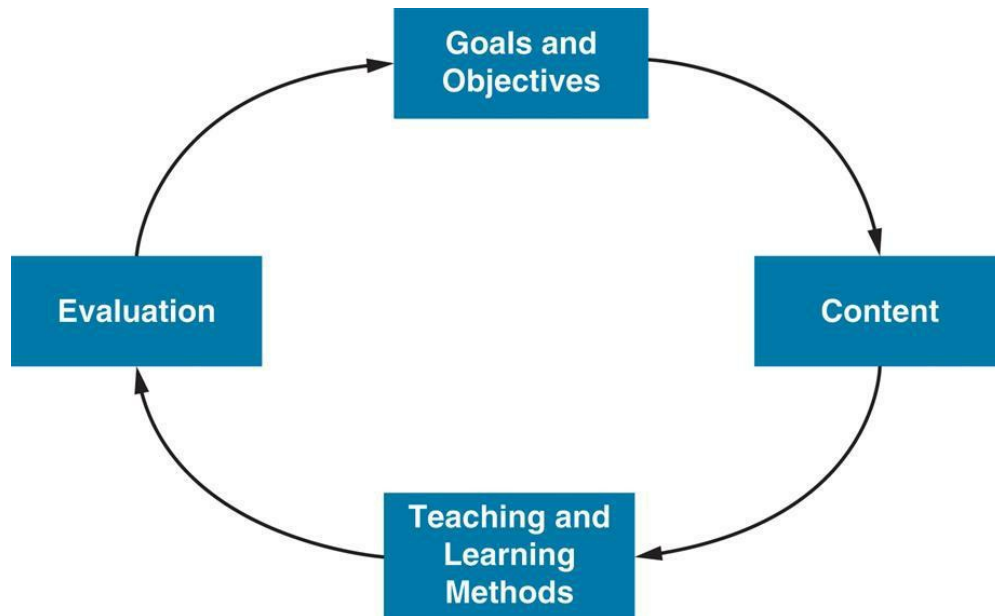


FIG. 42.2 The educational cycle.

Offer a diversity of educational methods

In line with principles of adult learning, staff development programmes should try to offer a variety of educational methods that promote authentic learning, reflection, feedback and immediacy of application. Common learning methods include interactive lectures, case presentations, small-group exercises and discussions, role plays and simulations, videotape reviews and live demonstrations (many of these methods are described in other sections of this book). Practice with feedback is also essential, as is the opportunity to reflect on personal values and attitudes. Online modules, debates and reaction panels, journal clubs, independent study and educational projects are additional methods to consider. In line with the previous example, a workshop on interactive lecturing might include interactive plenaries, small-group discussions and exercises and opportunities for practice and feedback. A fellowship programme might include group seminars, independent projects and structured readings. Whatever the method, the needs and learning preferences of the participants must be respected, and the methods should match the objectives.



Tip

Promote experiential learning, reflection, feedback and immediacy of application.

Promote 'buy in' and market effectively

The decision to participate in a staff development programme or activity is not as simple as it might at first appear. It involves the individual's reaction to a particular offering, motivation to develop or enhance a specific skill, being available at the time of the session and overcoming the psychologic barrier of admitting need (Rubeck & Witzke, 1998). The challenge for faculty developers is to overcome reluctance and to market the 'product' in such a way that resistance becomes a resource to learning. Continuing education credits, as well as free and flexible programming, can also help to facilitate motivation and attendance. 'Buy in' involves agreement on importance, widespread support, and dedication of time and resources at both the individual and the systems level and must be considered in all programming initiatives.



Tip

Focus on the organization as well as the individual.

Work to overcome commonly encountered challenges

Common implementation problems, such as a lack of institutional support, limited resources, and limited faculty time, have been discussed in an earlier section. Faculty developers must work to overcome these problems through creative programming, skilled marketing, targeted fundraising, and the delivery of high-quality programmes. Flexible scheduling and collaborative programming, which address clearly identified needs, will further help to ensure success at a systems level.



Tip

Collaborate with key stakeholders to effect change.

Prepare staff developers

The recruitment and preparation of staff developers are rarely reported. However, it is important to recruit carefully, train effectively, partner creatively and build on previous experiences. Faculty members can be involved in a number of ways: as cofacilitators, programme planners or consultants. To involve new faculty members in staff

development, one can conduct a preparatory meeting (or 'dry run') to review content and process, solicit feedback and promote 'ownership'. One can also conclude each activity with a 'debriefing' session to discuss lessons learned and plan for the future. Whenever possible, staff developers should be individuals who are well-respected by their peers and have some educational expertise and experience in facilitating groups. It has been said that 'to teach is to learn twice'; this principle is clearly one of the motivating factors that influence staff developers.



"I was given new tools to teach. Not only were they described to me in words, but they were also used in front of me and I was part and parcel of the demonstration."

McGill Teaching Scholar

Evaluate and demonstrate effectiveness

The need to evaluate staff development programmes and activities is clear. In fact, the evaluation of staff development is more than an academic exercise, and findings must be used in the design, delivery and marketing of future programmes. If staff development is to promote education as a scholarly activity, it must role model this approach.

In preparing to evaluate a staff development programme or activity, the following should be considered: the goal of the evaluation (e.g., programme planning versus academic inquiry), available data sources (e.g., participants, peers); common methods of evaluation (e.g., questionnaires, focus groups); resources to support assessment; and models of programme evaluation. [Kirkpatrick and Kirkpatrick's \(2006\)](#) levels of evaluation can also be helpful in conceptualizing and framing the assessment of outcome. They include the following:

- Reaction: participants' views on the learning experience
- Learning: changes in participants' attitudes, knowledge or skills
- Behaviour: changes in participants' behaviour
- Results: changes in the organizational system, the patient or the learner.

At a minimum, a practical and feasible evaluation should include an assessment of utility and relevance, content, teaching and learning methods and intent to change. Moreover, as evaluation is an integral part of programme planning, it should be conceptualized at the beginning of any programme. It should also include qualitative and quantitative assessments of learning and behaviour change, using a variety of methods and data sources.

**Tip**

Evaluate effectively and ensure that the outcomes of the process will inform practice.

Summary

Academic vitality is dependent upon faculty members' interests and expertise. Staff development has a critical role to play in promoting academic excellence and innovation. In looking to the future, the focus should be on content areas that go beyond the improvement of specific teaching skills and include educational leadership, educational scholarship, and career development. It will also be important to adopt diverse educational formats, such as workshops and integrated longitudinal programmes, decentralized activities, self-directed learning and peer coaching. Educators should also consider the benefits of work-based learning and communities of practice in promoting staff development, as well as the value of staff development in fostering a sense of community. Staff development programmes can promote organizational change and development and should be used for this purpose. As well, programme planners should evaluate the effectiveness of all that is done so that practice informs research and research can inform practice. This will help us to remain innovative and flexible so that the everchanging needs of our teachers, our institutions and the healthcare systems can be addressed.

References

- Barab et al., 2002 Barab SA, Barnett M, Squire K. Developing an empirical account of a community of practice: characterizing the essential tensions. *The Journal of the Learning Sciences*. 2002;11(4):489–542.
- Billett, 2002 Billett S. Toward a workplace pedagogy: guidance, participation, and engagement. *Adult Education Quarterly*. 2002;53(1):27–43.
- Bland et al., 1990 Bland CJ, Schmitz CC, Stritter FT, eds. *Successful faculty in academic medicine: essential skills and how to acquire them*. New York: Springer Publishing Company; 1990.
- Boillat and Elizov, 2014 Boillat M, Elizov M. Peer coaching and mentorship. In: Steinert Y, ed. *Faculty development in the health professions: a focus on research and practice*. Dordrecht, the Netherlands: Springer; 2014.
- Chan et al., 2015 Chan TM, Thoma B, Lin M. Creating, curating, and sharing online faculty development resources: The Medical Education in Cases Series experience. *Academic Medicine*. 2015;90(6):785–789.
- Cook and Steinert, 2013 Cook DA, Steinert Y. Online learning for faculty development: a review of the literature. *Medical Teacher*. 2013;35(11):930–937.
- Daloz, 1986 Daloz LA. *Effective teaching and mentoring* San Francisco: Jossey-Bass; 1986.
- de Carvalho-Filho et al., 2020 de Carvalho-Filho MA, Tio RA, Steinert Y. Twelve tips for implementing a community of practice for faculty development. *Medical Teacher*. 2020;42(2):143–149.
- Flynn et al., 1994 Flynn SP, Bedinghaus J, Snyder C, Hekelman F. Peer coaching in clinical teaching: a case report. *Family Medicine*. 1994;26(9):569–570.
- Jason and Westberg, 1982 Jason H, Westberg J. *Teachers and teaching in US medical schools* Norwalk, CT: Appleton-Century-Crofts; 1982.
- Kirkpatrick and Kirkpatrick, 2006 Kirkpatrick DL, Kirkpatrick JD. *Evaluating training programs: the four levels* San Francisco: Berrett-Koehler Publishers; 2006.
- Knowles, 1980 Knowles MS. *The modern practice of adult education: from pedagogy to andragogy* Englewood Cliffs, NJ: Cambridge Adult Education; 1980.

- McLean et al., 2008 McLean M, Cilliers F, Van Wyk JM. Faculty development: yesterday, today and tomorrow. *Medical Teacher*. 2008;30(6):555–584.
- Rubeck and Witzke, 1998 Rubeck RF, Witzke DB. Faculty development: a field of dreams. *Academic Medicine*. 1998;73(9 Suppl):S32–S37.
- Schön, 1983 Schön DA. *The reflective practitioner: how professionals think in action* New York: Basic Books; 1983.
- Schor et al., 2011 Schor NF, Guillet R, McAnarney ER. Anticipatory guidance as a principle of faculty development: managing transition and change. *Academic Medicine*. 2011;86(10):1235–1240.
- Steinert, 2010 Steinert Y. Becoming a better teacher: from intuition to intent. In: Ende J, ed. *Theory and practice of teaching medicine*. Philadelphia: American College of Physicians; 2010.
- Steinert, 2014 Steinert Y, ed. *Faculty Development in the health professions: a focus on research and practice*. Dordrecht, the Netherlands: Springer; 2014.
- Steinert et al., 2016 Steinert Y, Mann K, Anderson B, et al. A systematic review of faculty development initiatives designed to enhance teaching effectiveness: a 10-year update: BEME Guide No 40. *Medical Teacher*. 2016;38(8):769–786.
- Steinert et al., 2003 Steinert Y, Nasmith L, McLeod PJ, et al. A teaching scholars program to develop leaders in medical education. *Academic Medicine*. 2003;78(2):142–149.
- Steinert et al., 2019 Steinert Y, O’Sullivan PS, Irby DM. Strengthening teachers' professional identities through faculty development. *Academic Medicine*. 2019;94(7):963–968.
- Swanwick, 2008 Swanwick T. See one, do one, then what? Faculty development in postgraduate medical education. *Postgraduate Medical Journal*. 2008;84(993):339–343.
- Wilkerson and Irby, 1998 Wilkerson L, Irby DM. Strategies for improving teaching practices: a comprehensive approach to faculty development. *Academic Medicine*. 1998;73(4):387–396.

Mentoring

Subha Ramani and Larry Gruppen

Trends

- Mentoring is moving away from the traditional dyadic senior mentor-junior mentee relationships.
- Peer mentoring, where groups of near peers reflect on their professional challenges and formulate strategies for collaboration and academic advancement, is increasingly seen as a psychologically safe mentoring space.
- Because there are multiple pathways to academic advancement in health professions education, mentees should seek multiple mentors with different areas of expertise who can offer a variety of perspectives on professional development.
- Mentoring skills are not innate and do not develop automatically with seniority, they need to be developed, inculcated and rewarded.
- Virtual mentoring has broken through geographic boundaries, allowing mentors and mentees from different parts of the globe to develop meaningful mentoring relationships.

Key concepts

- Mentoring network: comprises multiple mentors at varying stages in their career (seniors, peers or juniors), with different areas of expertise, within and outside one's own institution, and across professional disciplines.
- Speed mentoring: based on the concept of speed dating, these sessions provide mentees with opportunities to meet multiple potential mentors over a short time to get answers for specific career-related questions. Ongoing relationships may develop, but not required.
- Sponsorship: a sponsor is a person in a senior leadership role who uses his/her influence and connections to open doors and create professional opportunities for a junior colleague or staff. They should have knowledge of the accomplishments of their junior colleague, but a longitudinal relationship is not required.
- Virtual mentoring: a mentoring relationship that may be partially or completely initiated and maintained through electronic communications, such as email, phone calls or video conferences. Electronic communications have facilitated meaningful longitudinal mentoring relationships.

Introduction

Traditionally, a mentoring relationship is defined as one that develops between a senior professional, the 'mentor,' and a younger colleague, the 'mentee' or 'protégé'. In Homer's *Odyssey*, Mentor was a trusted friend of Ulysses, who was entrusted with the education of his son, Telemachus, when he set out for the Trojan War. From this epic arose the use of the word 'mentor' as a wise and faithful counsellor. Today, a health professions educator can pursue a variety of professional interests and career trajectories. Given the multitude of academic pathways along which health professions educators can progress, it would be challenging for a single, traditional mentor to facilitate all aspects of their mentee's development, such as curriculum development, assessment, simulation, educational research, and so on. Therefore newer models of mentoring have been gaining attention and these will be described in more detail.



"One of the greatest values of mentors is the ability to see ahead what others cannot see and to help them navigate a course to their destination."

John C. Maxwell

An effective mentoring relationship is often viewed as an essential step for achieving success in any profession. Mentoring positively influences personal development, career guidance and overall productivity. Effective mentoring may also increase career satisfaction, reduce faculty burnout, and improve job retention. Other positive outcomes of formal mentoring programmes reported include professional networking and entry into a community of practice. Yet, research indicates that junior faculty find it challenging to seek mentors and initiate mentoring relationships.

Despite the importance of mentoring, mentors rarely receive training on the mentoring process, do not have opportunities to discuss effective mentoring practices with peers and are often ill equipped to face challenges when taking on major mentoring responsibilities. Mentor-mentee relationships are also challenged by increased clinical, research, and administrative demands on faculty. Moreover, there is a perception that mentorship is undervalued by academic institutions and does not contribute to career advancement of mentors. It is therefore essential for institutions to implement formal mentoring programmes, provide staff development and support for mentors, and overtly recognize and reward faculty who take on major mentoring responsibilities.



"The mentoring relationship should be based on adult-to-adult conversations that are confidential, nonjudgemental and mentee-centred. It requires the highest level of empathy and trust."

Definitions

Many types of professional relationships exist, some of which overlap considerably with mentoring. The subsequent definitions may help distinguish among the different types of obligations that come with such roles as mentor, advisor, role model, collaborator, coach and sponsor. It should be emphasized that a mentor can perform all the other roles, but those in other roles do not automatically become mentors. Mentoring and collaboration are two-way partnerships, most other roles can be unidirectional.

- Mentoring implies a two-way relationship between the mentor and the mentee. The mentor has a genuine interest in the personal and professional growth of a mentee and often the relationship is judged by the mentees' success. The mentor provides information, gives advice and facilitates networking, but also offers critical support for the mentee during challenging periods.
- Advising involves providing information in a neutral fashion. Although the advice or information is given in a friendly manner, a bond need not develop between the advisor and the advisee. An advising relationship can be terminated after one or several meetings and usually focuses on a specific career goal, for example, further specialization, research collaboration, clinical placement, and so on.
- Coaching refers to a formal or informal relationship, where a more experienced person provides training and guidance to a learner or junior colleague. The goal is to achieve or succeed at a specific personal or professional goal, which is where it differs from mentoring.
- Collaboration is more often a partnership between peers or near-peers at any professional level with the mutual goal of increasing productivity, increasing resources or developing specific skills. Such relationships can be long-term but are more usually short lived and end when the goals have been achieved.
- A role model is one whose professional behaviours and academic values are emulated by junior faculty or trainees. There may not be an actual personal relationship between the one who incorporates these characteristics and the role model. A mentor can be a role model, but a role model does not have to be a mentor. A role model could be a historical figure, such as Sir William Osler.
- Sponsorship is when a person in a leadership role uses his or her influence to advocate on someone's behalf, typically a junior colleague or staff. Typically, this requires that the sponsor knows the person's professional abilities well enough as their reputation and prestige is at stake. A longitudinal relationship is not required.

Benefits of mentoring

The benefits of a mentoring relationship are manifold. A successful partnership can lead to the professional development of both individuals. Mentors experience the satisfaction of nurturing and aiding the professional growth of a junior trainee or colleague. Institutions may recognize and reward successful mentors. The Association of American Medical Colleges consensus group on Educational Scholarship has strongly recommended that institutions should add mentoring to their list of educational activities that can promote educational scholarship and academic advancement ([Box 43.1](#)).

Box 43.1

Benefits for mentors

- Professional stimulation/rejuvenation
- Internal reward of developing younger colleagues
- Sense of giving back to the profession

Benefits for mentees

- Support in professional development
- Brainstorm solutions to professional challenges
- Time to reflect on, clarify and advance goals
- Orientation to the organizational culture and behaviour
- Advise during trying times in their career

Approach to mentoring: balancing support–challenge–vision

In 1986 Daloz described a mentor–mentee model which balances three elements: support, challenge and vision ([Fig. 43.1](#)). Support refers to activities that boost self-efficacy of the mentee such as showing respect, providing opportunities and resources, giving positive feedback, etc. Challenge forces mentees to work actively towards their career goals and reflect on their skills and values; actions include listing tasks to achieve goals, setting timelines, providing constructive or negative feedback. Finally, mentors help mentees develop their professional vision by stimulating discussions about their long-term goals. Without challenge, there can be no professional growth and results in static careers. However, mentees need support if they are to venture out of their comfort zone and challenge themselves. Support will enable mentees to have a sense of belonging within their organization, continue to set lofty professional goals even if initial attempts are unsuccessful. Finally, professionals should be able to periodically set long term career goals, including how they would handle career transitions. Underlying all these values there should be the realization that mentees have the freedom to completely change career paths during the course of their academic life and need support during these changes.

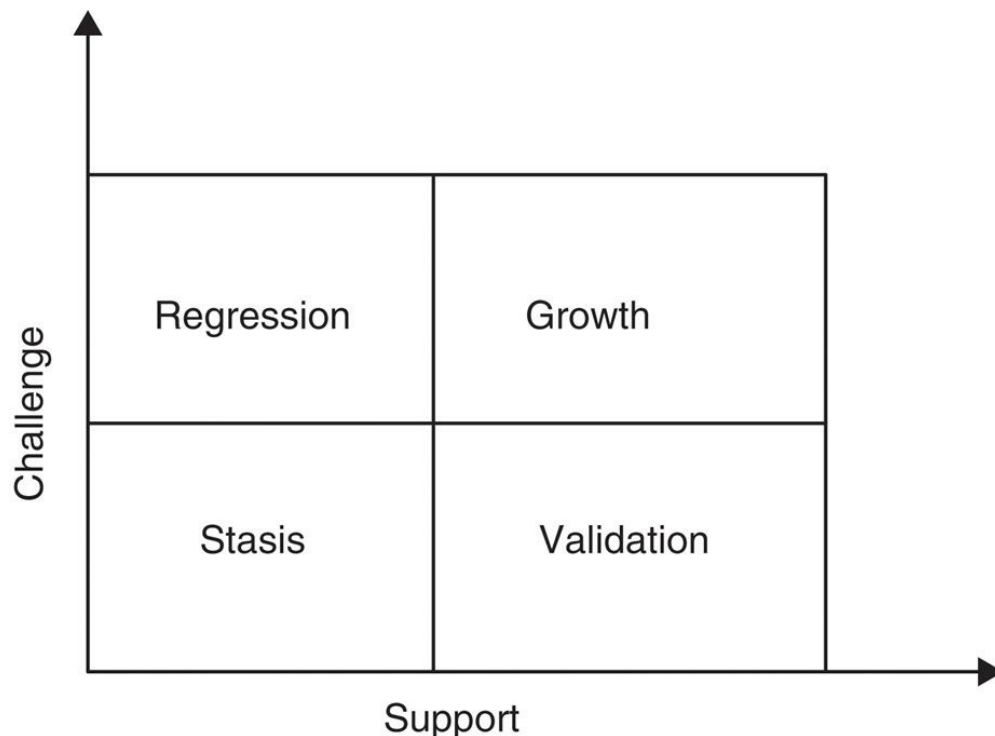


FIG. 43.1 The Daloz model of support and challenge and influence on professional development. (Modified from [Daloz, 1986](#).)



“Effective mentor–protege relationships should balance three elements: support, challenge and a vision of the protege’s future.”

Daloz (1986)

Roles and tasks of a mentor

Several roles have been described for mentors, which are relevant to most professional roles including clinicians, researchers, educators, administrators and leaders who take on mentoring responsibilities in medical education ([Box 43.2](#)).

Box 43.2

Seven possible roles of a mentor:

1. Teacher
2. Sponsor
3. Advisor
4. Agent
5. Role model
6. Coach
7. Confidante

The multiple mentor roles come with several tasks in a mentoring relationship, and we describe some important ones subsequently:

- Professional socialization: mentors can help mentees who are new to an institution learn about institutional vision and goals, help them find their way around a large organization, and refer them to peers or senior colleagues for further guidance or collaboration.
- Career development: a mentor can help a mentee establish professional goals early in their career and guide them towards the resources needed to achieve these goals. These goals can relate to research, administrative or educational aspects of a medical educator's career but the goals could also relate to personal growth. Guidance is especially crucial during career transitions from trainee to faculty as well as through faculty career transitions.
- Networking: mentors can help mentees network within and outside their own institution for further mentoring, collaboration in research or educational activities and skill development.
- Give feedback: mentors can review periodically whether their mentees are proceeding in the right direction to accomplish their academic goals and redirect them when needed. In addition, they can review mentee evaluations by juniors, peers or seniors and provide feedback on their strengths and weaknesses.
- Coach: mentors can provide coaching when their mentees have to learn new skills, such as research methods or teaching. If they themselves do not possess these skills, mentors must be proactive in referring mentees to others who could help their mentees gain these skills. Mentors should be able to see the potential

- in their mentees and actively groom them for future leadership positions.
- Support: mentees need support from mentors when they are exploring career paths, stretching their talents to make innovative contributions, facing failures or conflicts with other colleagues. They may also seek their mentors' help when faced with personal challenges and under these circumstances, mentors need to be very aware of professional boundaries (Box 43.3).

Box 43.3

What mentees value in mentors

Academic

- Guide professional development
- Assist in preparation for promotion
- Help with specific strategies to achieve professional goals
- Foster development of academic identities
- Assist in networking
- Set high standards and expectations
- Help navigate institutional politics
- Help with academic socialization
- Use his/her influence to support mentees' academic advancement
- Direct mentees towards assignments that prepare them for higher positions

Psychosocial

- Allow mentees to formulate ideas and goals
- Commit time to the relationship
- Act as advocate
- Show respect, empathy
- Trustworthy, respects confidentiality
- Give nonjudgemental feedback
- Knowledge of the mentee as a person and a professional
- Support professional-personal balance



"Excellent mentors leave a legacy of good mentoring through role modelling and institute policies to set global expectations and standards for mentorship."

Types of mentoring relationships

Mentoring relationships do not need to be face-to-face or one-on-one or even senior to junior. In modern educational settings, trainees and faculty may enjoy long distance mentoring relationships and group peer mentoring which educators have reported as successful in promoting academic success of mentees.

- **Dyadic mentoring:** this is the most traditional form of mentoring between a senior mentor and a junior mentee. The notion of a senior professional promoting the career of a junior mentee has shaped mentoring in medical education and senior physicians are expected to model desired behaviours and attitudes for their juniors.
- **Multiple (a mentoring network):** frequently mentees choose one senior person as a primary mentor but have other secondary mentors who can be useful in specific areas of their careers. Such a network may consist of multiple mentors at various stages of their profession who have different but synergistic areas of expertise.
- **Group mentoring:** a mentoring group or team comprises multiple mentors and mentees. Mentors allow each of the mentees in the group to reflect on their goals and challenges. Rather than one-on-one, this is a many-on-many format.
- **Formal:** many institutions have formal mentoring programmes that assign mentors for trainees or junior faculty similar to a 'blind date'. It has been reported that such formal mentoring relationships may be troubled by power and status issues and less successful in the long run. However, it has also been reported that the majority of medical trainees and faculty report having no mentors; therefore a formal programme could be a good starting point to provide mentees with opportunities to discover other mentors.
- **Informal:** informal mentoring occurs serendipitously when two individuals meet and discover mutual interests and goals. This type of mentoring has been described as the most successful and is characterized by a long-term, supportive, compatible and mutually satisfying relationship. However, only a minority of trainees or faculty are fortunate enough to have access to informal mentoring relationships. It has been reported that women and those belonging to an ethnic minority find it particularly difficult to find mentors on their own.
- **Peer:** educators have reported that peer mentoring relationships can be very successful. With increased responsibilities of senior faculty, as well as diminished access to them, all junior faculty and trainees cannot be mentored by senior faculty effectively. Peer group mentoring can support relationship development, avoid the power issues embedded in the use of senior mentors and compensates for the dearth of trained and willing senior mentors. It moves from a hierarchical mentoring relationship to a collaborative and mutually satisfying one.
- **Distance:** several professional organizations promote one-on-one long-distance

mentoring relationships. Such mentoring usually focuses on research collaboration but with the advent of electronic communication it is easy for all medical educators to maintain distance relationships via telephone or email. These relationships sometimes begin when a mentor and mentee work at the same institution and then continue after they move on to different organizations.

Stages of a mentoring relationship

1. Initiation phase: a mentoring relationship can be initiated spontaneously by the discovery of mutual interests and liking or as a result of a formal mentoring programme. During this phase the mentor and mentee should meet frequently and discuss shared goals, values and interests. This forms the settling-in period of the relationship. This is also the time to evaluate whether there is a fit between their personalities and by the end of this period the relationship ideally becomes open and relaxed.
2. Cultivation phase: during this phase, the work aspect of the relationship begins in earnest. Now that the mentor and mentee have a relaxed relationship, it is time to set the ground rules for the relationship. The mentor should encourage the mentee to establish career goals and list discrete tasks to achieve these goals. Then, the mentor should periodically review the goals and activities, give feedback, provide resources, and encourage networking. The goal is to challenge the mentee to accomplish their academic goals and support them in these efforts.
3. Separation phase: separation can be planned, such as the end of training, retirement of the mentor, or unplanned, such as sudden departure of the mentor from an institution or illness. Planned separations are tinged with sadness but there is time to adapt to the separation and there is also excitement about the future. Unplanned separations can lead to a sense of abandonment, anger or depression.
4. Redefining phase: a mentoring relationship can continue beyond the training period or after the mentee and mentor have moved on to different organizations. During this phase the mentee becomes more of a peer and a successful mentoring relationship could promote lifelong friendship. Mentors who discover this stage find it most rewarding.

Challenges in mentoring

Although the literature highlights the benefits and advantages of mentoring, mentors should be aware that there are risks and problems associated with mentoring relationships. Mentors and mentees may not enter the relationship with common goals and expectations or equal levels of commitment. Mentees may make unreasonable demands of their mentors and even expect them to solve all their emotional and academic problems. Assigned mentors may be disinterested and unhelpful to their mentees and such relationships may be threatened by hierarchy, generational tensions or personality clashes. Mentors may try to propagate their own career interests in their mentees and fail to recognize that their mentees' professional aspirations and identity could be very different from their own. Mentors who are also their mentees' superiors and evaluators could threaten their mentees' growth by involving them in their own research or educational activities and there could be conflicts in authorship of shared publications and presentations. Finally, both parties should be careful to avoid emotional over-dependence or inappropriate personal feelings, all of which could irreparably damage the career of both.



"Mentor training should include knowledge of professional boundaries, and recognition of psychosocial problems that need referral to professionals, such as psychologists or counsellors."

Ramani et al. (2006)

Designing effective mentoring programmes

The undeniable benefits of mentoring naturally lead many institutions to seek to promote and manage it. A common strategy is to develop a mentoring programme in which faculty members are assigned as mentors to learners. These 'arranged marriages' are necessary in such programmes because relying on the haphazard and unpredictable dynamic of the 'natural' development of a mentoring relationship would likely leave many learners without a mentor. Leaving mentoring relationships to develop naturally has become even more problematic with the increased pace of clinical and academic work and heightened demands on productivity. Fewer faculty members have time to mentor a learner or may see this as a luxury that will produce little institutional recognition.

Formal or planned mentoring programmes may be designed by an institution as a short-term means of attaining a specific goal and the mentor's role is defined by the goals of the programme. Unfortunately, assigned mentoring relationships can often result in a forced fit between learner and mentor that proves to be less effective than hoped for. Indeed, many of these relationships wither from neglect because they lack a foundation of shared experience or common interest. We recommend the following strategies to maximize the impact of mentoring programmes.

1 Allow learners to have some influence on the assignment of the mentors

Although it will be simplest for a programme to assign mentors, giving learners an opportunity to identify mentors from a pool of mentor candidates gives them greater input into the relationship and may improve the probabilities of a successful relationship. Giving up the control over mentor assignment requires greater flexibility on the part of the programme in recruiting an adequate pool of mentor candidates, giving learners some opportunity to get to know the mentors, and dealing with the complications of some mentors being identified by multiple learners and others being selected by no one.

2 Clarify the expectations of the relationship

Mentoring programmes may target differing outcomes, such as research productivity, career development, learning in a specific domain, or advancement in a specific role, such as teaching. These different targets will influence the purpose and the structure of the programme and thus need to be made clear to mentors and learners.

3 Allow for changes in mentoring assignments

Because some assignments of mentors are likely to fail, it is important that a learner in such a relationship does not suffer as a consequence. Programmes should provide the

opportunity to replace one mentor with another or even adding a mentor to complement the assigned mentor's contributions.

4 Monitor the health of the relationships

Mentoring programme administrators cannot assume that once the mentoring assignments have been made, all will turn out well. Periodic queries to both mentors and learners are essential to uncover problems in the relationship. These queries should be sensitive to the fragility of early mentoring relationships and the goals of the programme, as well as those of the mentors and learners.

5 Foster effective communication

Programmes should support events and mechanisms that increase the amount and quality of communication between mentors and learners. These can include social events, scientific sessions, and periodic reminders to both mentor and learner about the importance of communication.

6 Recognize and support the mentors

Mentors are too often unsung heroes who receive little acknowledgement of their efforts. In part, this is because much of the mentor's efforts are invisible to anyone other than the learner. Mentoring programme administrators must work diligently to ensure that mentors are recognized and rewarded appropriately, whether through public expressions of gratitude and recognition, compensation, or institutional recognition in the form of promotion or position. Such recognition may well require a change in the culture of the institution, which thus becomes a mandate for administrators of these mentoring programmes.

7 Provide staff development for mentors

Although some mentors are born, others are made, and all can benefit from opportunities to develop their skills in aspects of the mentoring relationship. Mentoring, like many academic activities, requires a significant amount of effort and there are those who perform this role effortlessly and effectively. The literature has multiple examples of staff development initiatives for improving mentors' skills and the themes of these efforts can be described in these 12 tips for developing mentors ([Box 43.4](#)).

Box 43.4

What mentors need:

- Clear expectations of their roles

- Enhanced listening and feedback skills
- Awareness of culture and gender issues
- To support their mentees but challenge them too
- A forum to express their uncertainties and problems
- To be aware of professional boundaries
- Need mentoring
- Recognition
- To be rewarded
- Protected time
- Support
- Opportunities for peer mentoring

Evaluating mentoring and mentoring programmes

Mentoring programmes need to be evaluated frequently to ensure that they are meeting their goals and that the mentoring is successful. The same basic evaluation principles used in evaluating other educational programmes apply to mentoring programmes and some specific issues are worth highlighting.

1 Evaluating the mentoring process

Much of the evaluation will focus on the mentoring process rather than the outcomes of mentoring, simply because the outcomes (career success, publications, etc.) often take a very long time to manifest themselves. Some relatively simple measures of the process include such variables as frequency of meetings, length of the mentoring relationship, and the number of mentors or learners who drop out of the programme. However, most process variables will reflect the perceptions, experiences and attitudes of the mentors and learners. Questionnaires, interviews and focus groups are all appropriate methods for such data collection.

Important dimensions that could be derived from the participants include: overall satisfaction with the mentoring relationship, understanding of the programme goals, expectations of the mentor or learner for the other party, identification of specific strengths and weaknesses in the relationship, suggestions for programme improvement, learner comfort in challenging the mentor or in sharing sensitive issues, and many more. The specific items included in the evaluation must reflect the goals of the programme and the fundamental characteristics of the mentoring relationship outlined earlier in this chapter.

2 Evaluating the mentoring outcomes

Relevant outcomes to evaluate are a reflection of the purposes of the programme, but an overarching principle is that these outcomes need to be clearly identified in measurable terms. 'Achieving success in their chosen field' may be an appealing goal for a mentoring programme but is useless as an evaluation guide unless the programme can define what 'success' looks like and how it can be assessed.

That said, there are a number of common outcomes of mentoring programmes that can be mentioned. Career progression can be measured by the number of years between promotions or other landmarks, which can then be compared with other learners outside the programme. Scientific productivity as standard measures (publications, presentations, grants, etc.) can also be quantified and compared with a nonmentored group of similar learners. The development of a professional or collegial network is often a programme goal and several innovative methods have been identified to quantify such networks and compare their development and change over time, as well as compare them to networks of nonmentored learners.

Summary

Faculty or trainees in effective mentoring relationships state that they find their professional identity and accomplish their goals faster than those without mentors. Balancing support, challenge and vision is one of the most important foundations of successful mentoring and this should be emphasized in mentor development. Institutions should try to move away from inflexible, assigned mentoring and create an environment where spontaneous mentoring relationships can form and flourish. The traditional dyadic, mentor–mentee relationship is only one of the many types of effective mentoring relationships that are possible in the modern world of medical education. Mentors are not born and should be trained, supported and rewarded. Expectations of a mentoring relationship should be explicitly stated between mentors and mentees whether the focus is on research, educational or administrative areas. Lastly, mentoring programmes should be evaluated for both process and outcomes with the understanding that it may take several years to evaluate measurable outcomes.

References

- Daloz, 1986 Daloz LA. *Effective teaching and mentorship: realizing the transformational power of adult learning experiences* San Francisco: Jossey-Bass; 1986;209–235.
- [Lakhani, 2015](#) Lakhani M. When I say ... mentoring. *Medical Education*. 2015;49(8):757–758.
- [Ramani et al., 2006](#) Ramani S, Gruppen L, Kachur EK. Twelve tips for developing effective mentors. *Medical Teacher*. 2006;28(5):404–408.

Further reading

- Balmer et al., 2011 Balmer D, D'Alessandro D, Risko W, Gusic ME. How mentoring relationships evolve: A longitudinal study of academic pediatricians in a physician educator faculty development program. *Journal of Continuing Education in Health Professions*. 2011;31(2):81–86.
- Berk et al., 2005 Berk RA, Berg J, Mortimer R, et al. Measuring the effectiveness of faculty mentoring relationships. *Academic Medicine*. 2005;80(1):66–71.
- Bower and Diehr, 1998 Bower DJ, Diehr S. Support-challenge-vision: a model for faculty mentoring. *Medical Teacher*. 1998;20:595–597.
- Cho et al., 2011 Cho CS, Ramanan RA, Feldman MD. Defining the ideal qualities of mentorship: a qualitative analysis of the characteristics of outstanding mentors. *American Journal of Medicine*. 2011;124(5):453–458.
- Choi et al., 2019 Choi AMK, Moon JE, Steinecke A, Prescott JE. Developing a culture of mentorship to strengthen academic medical centers. *Academic Medicine*. 2019;94(5):630–633.
- Cook et al., 2010 Cook DA, Bahn RS, Menaker R. Speed mentoring: an innovative method to facilitate mentoring relationships. *Medical Teacher*. 2010;32(8):692–694.
- DeCastro et al., 2013 DeCastro R, Sambuco D, Ubel PA, Stewart A, Jagsi R. Mentor networks in academic medicine: moving beyond a dyadic conception of mentoring for junior faculty researchers. *Academic Medicine*. 2013;88(4):488–496.
- Feldman et al., 2010 Feldman MD, Arean PA, Marshall SJ, Lovett M, O'Sullivan PO. Does mentoring matter? results from a survey of faculty mentees at a large health sciences university. *Medical Education Online* 2010;15 [10.3402/meo.v15i0.5063](https://doi.org/10.3402/meo.v15i0.5063).
- Kashiwagi et al., 2013 Kashiwagi DT, Varkey P, Cook DA. Mentoring programs for physicians in academic medicine: a systematic review. *Academic Medicine*. 2013;88(7):1029–1037.
- Omary, 2008 Omary MB. Mentoring the mentor: another tool to enhance mentorship. *Gastroenterology*. 2008;135:13–16.
- Pololi and Evans, 2015 Pololi LH, Evans AT. Group peer mentoring: an answer to the faculty mentoring problem? A successful program at a large academic department of medicine. *Journal of Continuing Education Health Professional*. 2015;35(3):192–200.

- Sambunjak et al., 2006 Sambunjak D, Straus SE, Marusic A. Mentoring in academic medicine: a systematic review. *Journal of American Medical Association*. 2006;296(9):1103–1115.
- Sambunjak et al., 2009 Sambunjak D, Straus SE, Marusic A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. *Journal of General Internal Medicine*. 2009;25:72–78.
- Shea, 1997 Shea G. *Mentoring: a practical guide* Normal, Ill: Crisp Publications; 1997.
- Tobin, 2004 Tobin MJ. Mentoring: seven roles and some specifics. *American Journal of Respiratory and Critical Care Medicine*. 2004;170(2):114–117.
- Waljee et al., 2018 Waljee JF, Chopra V, Saint S. Mentoring millennials. *Journal of American Medical Association*. 2018;319(15):1547–1548.

Burnout, Mistreatment and Stress

Marti Catheryn Balaam and Harriet Harris

Trends

- There is a rise of stress and burnout amongst health professionals and educators.
- Compassion has the potential to heal and prevent stress and burnout, and to alter the working conditions that give rise to mistreatment and bullying.
- To practice effectively, we need to distinguish between compassion and empathy.
- The concept of 'resilience' can cause people to feel judged, and can imply that the responsibility for burnout sits with nonresilient individuals, rather than with institutionalized work behaviours.

Key concepts

- Burnout: the most commonly used measure of doctors' mental health, and in pressing need of intervention.
- Curricula integration: integrating current professional guidance on student, doctor and patient safety and wellbeing into our curricula.
- Distinguishing compassion from empathy: critical for providing protection against overempathic stress and burnout responses.
- Psychological safety: a quality to enhance in working environments, and which counters mistreatment.
- Compassionate curricula and self-compassion teaching: offer us a way forward in instilling wellbeing in students and transformative shift in the way that doctors practice and live.

Introduction

There is increasing awareness in medical education of the need for wellbeing in our own lives and in our curricula, with people working in health and social care reporting higher levels of burnout and mental health difficulties than in any other occupational group ([General Medical Council, 2019](#) and [Society of Occupational Medicine and The Louise Tebboth Foundation, 2018](#)). The British Medical Association (BMA, 2018) surveyed UK doctors and students about their mental health and wellbeing, finding that participants felt under increasing pressure from rising patient demand, understaffing, lack of supportive and flexible working arrangements, bullying, and stigma associated with mental health ([British Medical Association, 2019](#)). Increasing demands on the healthcare system and its staff include: changes in demographics—specifically, an ageing population, with people living longer with long-term conditions and disabilities, and an ageing workforce that will need to be replaced; changing patterns of health and disease; advances in care and treatment; and shifts to community care ([Buchan et al., 2017](#)). These pressures sit alongside rapid organizational change, integration of health and social care, and continuing social inequality. Resultant difficulties with retaining staff lead to further shortages, and hence further potential for stress and burnout amongst medical staff.

Evidence indicates that poor wellbeing amongst medical professionals is also putting the quality of patient care at risk, with recent studies indicating that doctors with high levels of burnout are more likely to make major medical errors than those with lower levels ([West & Markiewicz, 2016](#)).

With reference to the students we teach, data collated from universities shows increasing levels of distress, anxiety, depression and loneliness among students, and decreasing levels of trust, sense of belonging, and connection ([British Broadcasting Company, 2019](#); [National Students Survey, 2018](#)).

These trends highlight the need to address the wellbeing of ourselves and our students, in ways that recognize and ameliorate stress, burnout and mistreatment.

In this chapter, we describe stress and burnout, and the impact that they can have upon medical professionals, students and educators. We point readers to current guidance from professional bodies, and we draw upon compassion research and our own teaching of undergraduate and postgraduate students, clinical educators and university staff to provide examples of effective responses to stress and burnout. We then consider mistreatment through the lens of compassion research into organizational systems. For example, the Francis Report (2013) calls for a “*common culture of caring, commitment and compassion*”, while also advocating “*zero tolerance of substandard care*” ([Mid Staffordshire NHS Foundation Trust \[MSNFT\], 2013](#)). Zero-tolerance environments do not engender cultures of “*caring, commitment and compassion*”, but instead generate silence, mistrust, bullying, fear of failing, and fear of being found out and punished. Research shows that there must be psychological safety within teams in order for colleagues to admit to mistakes from which we must learn, and to acknowledge the vulnerabilities that enable us to enact and embed compassion

([Worline & Dutton, 2017](#)).

The National Health Service (NHS) and the GMC both identify compassion as a core healthcare value, key to high quality patient-care ([General Medical Council, 2019](#); [MSNFT, 2013](#)). We hold that compassion is also key to the care that medical staff have for themselves and can extend to one another. Our institutions are still at an early stage in experiencing and evidencing the practice of compassion towards patients, students, ourselves and our colleagues. This chapter encourages us to grow our understanding by setting out practices based on research into compassion and self-compassion, for responding to stress and burnout.

Stress

Stress is a reaction to mental or emotional pressure, in which the body activates the autonomic nervous system, having a profound effect on a number of bodily systems. This is an evolutionary response which triggers a fight, freeze, or flight response allowing us to attack, become numb or flee when perceiving a threat. Initially when faced with threat (from a work deadline or an advancing troop of hungry bears) our sympathetic nervous system is activated, which prepares the body for action and continued alertness. There are a number of physical effects: our vision becomes sharper, our heart beats faster, blood pressure goes up, muscles tense, we sweat and breathe more quickly; all to prepare us for action, and all useful if faced with imminent danger to life.

The sympathetic nervous system also responds to nonlife-threatening pressures, such as deadlines, traffic jams and team tensions. It functions like the accelerator in a car: it provides a burst of energy so that we can respond to perceived threat. The parasympathetic nervous system acts like a brake. It promotes the rest and digest response, calming the body down once the danger is over.

As human beings, we need some stress in our lives to propel us into action. 'Good stress' is a concept that refers to a positive attitude towards our stress, as something that energizes us and enables us to get things done. However, if we are in stress-response for a prolonged time, with no opportunity to rest, even stress about positive things (such as a birthday) can be bad for us, because keeping us in a hypersensitive, hyperalert and hyperactive state.

As we become busier, if we do not stand back, take stock, meet our needs and replenish our energy, we grow tunnel vision, and become increasingly task orientated. We may come to see ourselves as indispensable, unable to imagine how others could do all that we do. We may think such thoughts as: "If you want something doing, you may as well do it yourself"; "I can't trust anyone else to do it properly, or fast enough"; "I can't afford to get it wrong"; "Everyone's depending on me". Doctors can take on a 'hero' model of working ([Newton et al., 2008](#)).

In this mode, we become unapproachable, difficult to help and therefore isolated. We are also prone to take out our frustration on others. We become less inclined to draw on strategies that help us, such as meeting with friends, playing music, going for walks and eating well, and incline more towards unhelpful behaviours, such as excessive alcohol use, unhealthy eating and social withdrawal. We also become fearful of 'failing' and of how others might judge us. We may lose sight of why we are doing what we are doing, and of what ultimately matters, and so lack a sense of purpose and joy in all our hard work. We are then less able to:

1. Support ourselves, or to draw support from others and from external stimuli
2. See the bigger picture: the human beings involved in the situation, including ourselves, our students, and the patients.

When we become narrowly focused on tasks, our behaviour can communicate indifference, callousness, and lack of humanity.



*"I will never forget a consultant physician gathering [us] students around the bed of a wizened old man and being forced to run through the differential diagnosis of his enlarged liver **as if he – the person – wasn't there**. The consultant didn't ask his consent, didn't take any notice of his fear when one of us said the liver could be cancerous, did nothing to exhibit an iota of human sensitivity.... all too frequently one of the factors that underpins poor care is an attitude to care that is **task based rather than person centred**."*

Haslam (2015) (emphasis added)

If the physiologic and psychosocial effects of stress are prolonged, they can lead to burnout. When burning out, we are no longer hyperactive and hyperalert, but depleted. We become exhausted and hardly able to be active, and we may become emotionally drained and numbed.

Burnout

Burnout is the most commonly used measure of doctors' mental health. It presents as emotional exhaustion, reduced capacity or personal accomplishment, and depersonalization (inability to make personal connections) ([General Medical Council, 2019](#); [NAM, 2019](#)). Under prolonged exposure of our bodies to cortisol, from the stress response of our sympathetic nervous system, our immunity, our sleep, our memory, our physical health and our connections to others are all compromised. We lose the ability to trigger our parasympathetic system, which would calm us. We develop negative and distrustful feelings towards others, and there is an increased likelihood that we will engage in risky and unhealthy behaviours.



"All I could do was lie on the sofa and look at the bird feeder out of the window. I was so tired I wasn't even really looking at it, and it gave me no joy."

Lecturer, University of Edinburgh

Preventing and recovering from stress and burnout

So how do we protect against stress and burnout for ourselves and for those we teach?

The GMC, in its publication *Caring for Doctors Caring for Patients* [General Medical Council, 2019](#), presents a call to action to promote mental health and wellbeing in doctors and healthcare staff, acknowledging that patient safety, good working relationships, and retention of staff rely upon creating supportive and compassionate working environments. The GMC identifies three core needs for an individual:

1. Autonomy/Control: the need to have control over our work lives, and to act consistently with our work and life values.
2. Belonging: the need to be connected to, cared for, and caring of others around us in the workplace and to feel valued, respected and supported.
3. Competence: the need to experience effectiveness and deliver valued outcomes, such as high-quality care ([General Medical Council, 2019](#))

The 2018 GMC outcomes for graduates, charges newly qualified doctors to *“demonstrate compassionate professional behaviour and their professional responsibilities in making sure the fundamental needs of patients are addressed”*; this includes medical graduates acting in ways that acknowledge potential risks to themselves and others, vis-à-vis to: *“demonstrate awareness of the importance of their personal physical and mental wellbeing and incorporate compassionate self-care into their personal and professional life”*, and *“demonstrate awareness of the need to self-monitor, self-care and seek appropriate advice and support”*.

This call for compassionate healthcare charges us with a responsibility as teachers to equip medical students and practitioners with knowledge and skills to help one another to become well and stay well, and to protect ourselves from stress and burnout. We observe that when graduates and practitioners are given tools to practise self-compassion, they can understand and enact effective self-care and boundary-setting.

The next section introduces the reader to compassion and self-compassion, and how they can be used in teaching and development.

Compassion

Compassion is attentiveness to the suffering of ourselves and others, with the wisdom and steps taken to relieve it.

When addressing stress, burnout, and mistreatment, we work with the science and practice of compassion, rather than with the concept of 'resilience'. 'Resilience' is the term often used for adapting well to stressful or traumatic experiences. However, resilience can feel like a judgemental term, as though we fail to be resilient if we are made ill by stress, and so fail to cope with both our work and our stress. The concept of resilience also comes under suspicion because employers may ask for resilience from employees while expecting them to endure unhealthy working conditions. For teaching and student contexts, however, there are some well-rounded accounts of resilience, such as <https://resiliencetoolkit.org.uk/>

There is now a wealth of research on compassion from the medical and social sciences evidencing the benefits of compassion. These include calming our stress responses; making positive changes within the brain; better physical health and as a consequence less healthcare uptake; improved patient outcomes; affecting positively how we relate to ourselves and others; more meaningful relationships; improving the culture of our work environments; and improved productivity at work (Gilbert, 2013; Sinclair et al., 2016; Worline & Dutton, 2017).

Nonetheless, medical educators will encounter resistance to the notion of compassion amongst some students. Despite evidence for the benefits of compassion, there is concern in medical, organizational and professional settings that compassion will cause burnout; take too much time; allow weakness into situations that need strength and toughness; allow injustice, or unfairness; and lack measurable impact.

It is important therefore to address these concerns head-on.

Does compassion cause burnout?

Doctors and other professionals can be wary of compassion if it is constructed as a behaviour that leads to fatigue and burnout. However, compassion properly understood energizes us, whereas empathy may deplete us if not enfolded into compassionate practice. It is therefore critical to distinguish between empathy and compassion (Singer & Bolz, 2013).

Within medical teaching, empathy is commonly taught as a clinical skill, whereas compassion is either conflated with empathy or not taught at all. Empathy involves taking in the feelings of another, and is often conveyed in terms of walking in another person's shoes. Empathy yields great insight, and can be used for good, in giving rise to acts of kindness, or for cruelty, such as in the hands of torturers. Empathy can also overwhelm us, such that we are unable to be pro-social or enact kindness. It can cause us to feel as emotionally stuck or drained as those with whom we empathize, which is why it may deplete us. If, however, we knit our empathic understanding into compassionate practice, then empathy informs our discernment and actions.

We define compassion as a threefold process:

1. Attentiveness, which enables us to notice and be sensitized to what is happening for people
2. Discernment, which is the sense-making and wisdom to understand what is needed
3. Action to prevent or relieve suffering (sometimes the action is simply to deepen the attentiveness).

Does compassion take too much time?

In one study, 56% of physicians said that they do not have time to be empathic ([Riess et al., 2012](#)). An empathic, or, we prefer, compassionate, exchange takes a certain kind of energy: the energy to notice and respond to suffering. However, it takes very little time, makes us feel better, and saves us money within healthcare ([Trzeciak & Mazzarelli, 2019](#)).

A Johns Hopkins University experiment with oncologists concluded that it takes 40 seconds to establish a compassionate rapport. They asked oncologists to say to their patients, “I know this is a tough experience to go through and I want you to know that I am here with you. Some of the things that I say to you today may be difficult to understand, so I want you to feel comfortable in stopping me if something I say is confusing or doesn’t make sense. We are here together, and we will go through this together.” ([Fogarty et al., 1999](#)). The data shows that such rapport is good for patients, who may then need less attention from practitioners, and good for doctors, who are energized and sustained for their next patients.

Does compassion lead to weakness or unfairness?

Discernment is a crucial aspect of compassion, because we need to discern how to act to relieve suffering. We might be tempted to give people what they want because we cannot bear to see them suffering, rather than discerning what is really needed. Medics need to be able to tolerate the distress of patients to administer the treatment that they need to get better. Teachers need to be able to tolerate the distress of students, to see them through their assignments. The insight and courage ([Gilbert, 2013](#)) to act wisely in the face of distress or suffering is a vital, and often difficult, part of being compassionate.

Does compassion lack measurable impact?

A concern that compassion cannot be measured is being met by the growing body of compassion research evidencing the impact of compassionate behaviour within healthcare and work settings, some of which is cited in this chapter. Furthermore, introducing compassion into healthcare invites us to rethink how we evaluate our practice in at least two significant ways.

First, some target setting can lead to distorted practice, as when patients are left outside accident and emergency (A&E) to 'reduce' A&E waiting times. When we measure success by patient recovery times, we find compassion to be a significant contributor.

Secondly, integrating compassion into the education of healthcare professionals invites us to deliberate thoroughly about what we value and what we measure. The gendered division of labour in the 19th century has impacted the construction of compassion as 'soft'. Bringing compassion science into medical education enables us to question a narrow notion of what is measurable, and to recognize that compassionate interventions can be designed and implemented with profound effects upon individual and societal wellbeing ([Balaam, 2017](#)).

Self-compassion

Compassion is incomplete if we do not include ourselves in amongst those who need compassion (which is everyone). Practising self-compassion involves becoming aware of and alleviating one's own suffering. Dr Kristin Neff, an educational psychologist at the University of Texas, Austin, has developed an academic field around self-compassion. She stresses three key elements: (1) recognizing that we all go through suffering, and 'We're all in it together'; (2) being kind to ourselves; (3) mindfulness, which she defines as "*clear-seeing and nonjudgemental acceptance of what's occurring in the present moment*" (Neff, 2015).

By reconnecting us to our needs and emotions, self-compassion is a powerful tool for meeting these needs and sustaining our ability to support others. For example, if as teachers we are stressed by a tight marking turnaround can acknowledge the difficulties this is causing us, so that we are then able to look after ourselves in respect of these difficulties. A pain not transformed is a pain transmitted, so if we are disgruntled by tight deadlines and too much work, and we press on with resentment, we can make ourselves ill and also take our unhappiness out on those around us. Living compassionately towards ourselves protects ourselves and others from the results of our becoming depleted.

Mistreatment and addressing the wider systems

Compassion involves not only understanding and motivating ourselves and others, but also addressing the wider systems in which we live and work.

Medical environments are highly competitive and fast-paced, as are medical schools. There is a heavy emphasis upon status and grades. Psychotherapist Paul Gilbert, who has developed the field of compassion-focussed therapy, distinguishes competitive systems from compassionate ones. Competitive systems are ones in which our success depends on the relative failure of others, as is the case with exams, or roles where status is highly prized (Gilbert, 2013; Neff, 2015). When caught in highly competitive dynamics we become insensitive to and intolerant of distress; our vulnerability may be taken advantage of, and we fear becoming bottom of the pile; a fear associated with suicidality. Moreover, the pressure to reach targets and measurable outputs increases the drive to work 'efficiently' (fast), even while it may reduce the efficacy of what we do (e.g., seeing patients so hastily that they need to return for more appointments, or they raise complaints or issue lawsuits).

It is very easy to become a persecutor or bully at work when we are ourselves stressed, and then we pass extra stress on to others. Indeed, hurt people hurt people.

In compassionate systems, all parties flourish together, rather than some winning out over others. Compassionate rapport between doctor and patient, lecturer and student, makes everyone feel better. Vulnerability is met with understanding, and this has practical benefits for our mental wellbeing, our relationships at work, and for health and safety. We often find in an academic or clinical environment that compassion is dismissed as 'soft'; an attitude that inhibits our sharing of worries. Research has shown that medical teams with higher quality of teamwork report higher rates of medical errors, not because they make more mistakes but because such teams have the 'psychological safety' to report and learn from 'near misses' (Worline & Dutton, 2017).

Teaching compassion with compassion

At our University, we work with a multidisciplinary team to deliver compassion and wellbeing teaching both within the medical curriculum and in the wider university environment.

The definition of compassion as attentiveness, discernment and action provides a template for our teaching, guiding the provision of compassionate teaching initiatives

An exercise in attentiveness (designed by Anne-Birgitta Pessi, University of Helsinki)

Get people into pairs: A and B

A is given instructions that B does not see: to describe to B something that A is looking forward to.

B is given instructions that A does not see: not to smile, move, nod, comment, etc.

A has a minute to speak, and the pairs then feedback how they felt.

This powerful exercise illustrates a range of emotions arising from a noncompassionate encounter and our need as humans for belonging and connection. We also infer from this exercise what compassionate engagement and attentive listening might involve, and so can move into active-listening exercises that encourage: unconditional positive regard, appropriate mirroring, development of rapport, skilful use of open and closed questions, a stillness that is calm enough to hold a silence for the other person's thoughts to develop.

Growing discernment

We grow discernment through becoming good at attending to ourselves and others. Discernment, or wisdom, is not a cerebral matter, but a whole-body matter: it involves learning from what our bodies are telling us (e.g., it is time to stop pushing on through), and what our collective bodies are telling us (e.g., too many people are off sick). Having the insight and courage to choose wise actions involves appropriate empathic distancing. We have already considered that moving out of empathy into compassionate action protects against burnout. Later are some practices that can be used in classroom settings to help develop our 'muscles' for moving beyond empathy and into action.

- Body posture: tilt the head to the side when in empathy, and be 'straightforward' when needing to move to a tough decision or action for the sake of a good outcome.
- Grounding and self-awareness: be mindful of the floor and seat beneath us, so that we can feel grounded when in circumstances of distress (our own or others')
- Scripts: 'the exams/chemotherapy will be tough, and you know that, but we are here to support you'; 'I am glad that you came to find me. I can't stop now, but please email me so that we can make a time to meet'.
- Mindful nonidentification: awareness that the intense feelings do not define me or engulf me; I am separate from them, and they can pass by like clouds in the sky.
- Detachment: attachment is a near enemy of compassion; it leads us to seek an outcome because we would feel better about it (for example, we would enjoy being regarded as kind), rather than wanting what is good for its own sake. Attachment generates co-dependency. Detachment enables freedom.

Action

Compassionate action follows from attentiveness and discernment, and is not prescribed in advance. When we practise compassion, including to ourselves, we become more compassionate. Conversely, if we practise judgement or competitiveness, we become judgemental or competitive. Evidence indicates that when we are compassionate to others or ourselves, we engage various physiologic systems, including our parasympathetic nervous system, producing a calming and healing response (Gilbert, 2013; Neff, 2015).

Effective compassionate actions can be small, taking minimal time and effort.



"I was feeling particularly overwhelmed and anxious, ruminating over my worries, when I attended a teaching session. The tutor had placed flowers on the table in an otherwise functional and impersonal teaching room, it gave me a sense of joy in an otherwise troubled mind"

Helping students to stay well

We begin our journey into wellbeing with our first year undergraduate medical students in welcome week getting them to identify in groups the things that help them stay well. We reiterate that people who are stressed or burning-out have a tendency to pull away from the things that keep them well and give them joy. We help them to become aware early on in their medical education of what enhances their joy and wellbeing, so that they can draw on these enhancements, as an emergency first-aid kit if needed.

‘Questions in a hat’, ‘Blether’ at Black Medicine, and “Am I the only one?”

Sharing our fears, including fears of being an imposter (especially when staff admit to this too), helps us to feel normal, reassured and connected. We are social animals with a need for connection ([General Medical Council, 2019](#)), and there is a collective sigh of relief when our students and staff realize that others also feel what they feel, be it overwhelmed, anxious, stressed, or not good enough.

We run ‘Questions in a hat’ throughout the year with various staff and student groups. Participants write their worries on pieces of paper and place them in a hat. We then read out the contributions anonymously, and everyone can hear and share such sentiments as: “I feel like a fraud”, “I’m stressed about exams”. ‘Blether’ is a similar process, held at a local café called Black Medicine, where senior medics answer questions and concerns that students place in a hat.

In addition, participants are encouraged to share what they find helps them deal with everyday stresses this promotes a sense of belonging and compassion for others.

We also run particular workshops asking: “Am I the only one who.....?” with such topics as: “Who doesn’t feel good enough to be here?”, or “Who is overwhelmed and stressed out?” ‘Questions in a hat’ is a good way to start these workshops. We then go on to investigate the bodily and emotional impact of our worries, and to develop and write compassionate answers to our concerns and experiences.

Medical humanities

There is growing evidence that medical humanities can help students to develop compassion through the use of art, literature, film and music (see [Ch. 29](#)) ([Gillies, 2017](#); [Wear & Zarconi, 2008](#)).

Cinemeducation in medical teaching connects students with emotional issues pertaining to personal and professional development, including death and breaking bad news. Using cinema in this way makes learning fun, draws on the ability of skilled artists to convey emotion, encourages creative thinking, and promotes empathy, discussion and reflection ([Alexander et al., 2012](#)).

There is risk that overdramatized elements of film, or stereotypes about health professions, be passively absorbed by students, however, contemporary media theory contends that audiences actively negotiate and test meanings therefore class time can be actively given for reflection and critique ([Hall, 1997](#)).

A recent development in medical humanities is *Tools of the Trade: poems for new doctors*; a pocket-sized anthology of 50 poems designed to assist newly qualified doctors to think about self-compassion and its importance when facing challenging situations. The anthology describes itself as offering 'inspiration, comfort and support'. It has been gifted to all new doctors in Scotland since 2014, with positive responses from both doctors and educators.

Role modelling

If we are not attending to our own wellbeing, we cannot adequately look after the wellbeing of others, nor can we be effective role models to our students. We often model exhaustion, skipped meals, and an unwillingness to suffer fools. This is not effective role modelling for our students. We teach others how to treat us, by how we treat ourselves. We will fare better if we all treat ourselves well!

Doctors play a central role in the mental health of both current and future generations of workforces globally. Their mental health directly effects the wellbeing of others. If doctors can work in environments where compassion towards themselves, colleagues and patients is the norm, rather than something to be rejected as 'soft' and wasteful of time, we would see a huge reduction in cases of stress, burnout and mistreatment in the medical world.

Summary

Stress, burnout and mistreatment are highly deleterious to medical professionals and their patients. Addressing these realities in the classroom can equip students to deal with them effectively both as learners and as subsequent practitioners. Key points are:

- Compassion and self-compassion provide effective responses to the stress induced by competitive, pressured environments, and enable us to balance the physiologic stress-response by activating the parasympathetic nervous system
- Compassion protects against burnout; empathy may perpetuate burnout
- Demonstrating compassion can take less than 1 minute, and brings benefits to both givers and receivers of compassion
- Mistreatment occurs in pressurized, competitive environments where fear of failing and of punishment run high; compassionate practice creates environments for teams to feel the requisite psychological safety to perform in ways that are optimum for the health and safety of themselves and their colleagues and patients.

References

- Alexander et al., 2012 Alexander M, Lenahan P, Pavlov A. *Cinemeducation: using film and other visual media in graduate and medical education* London: Radcliffe; 2012.
- Balaam, 2017 Balaam M. *Virtuous, invisible, and unconcerned; nurses, nursing and the media*. PhD Thesis Edinburgh: Queen Margaret University; 2017.
- BBC, 2019 BBC (2019). Who feels lonely? The results of the world's largest loneliness study: the anatomy of loneliness. BBC RADIO 4 (online). 9 January 2019. Available from: Pre-submission Page 29 of 29
<https://www.bbc.co.uk/programmes/m0000mj9/episodes/player>.
- British Medical Association, 2019 British Medical Association. Caring for the mental health of the medical workforce [Internet]. 2019. Available from: <https://www.bma.org.uk/collective-voice/policy-and-research/education-training-and-workforce/supporting-the-mental-health-of-doctors-in-the-workforce>.
- Buchan et al., 2017 Buchan J, Charlesworth A, Gershlick B, Seccombe I. *Rising pressure: the NHS workforce challenge* London: Health Foundation; 2017.
- Fogarty et al., 1999 Fogarty LA, Curbow BA, Wingard JR, McDonnell K, Somerfield MR. Can 40 seconds of compassion reduce patient anxiety?. *Journal of Clinical Oncology*. 1999;17(1):371–379.
- General Medical Council, 2018 General Medical Council (2018). Outcomes for graduates. Available at: <https://www.gmc-uk.org/education/standards-guidance-and-curricula/standards-and-outcomes/outcomes-for-graduates>.
- General Medical Council, 2019 General Medical Council (2019). Caring for doctors. Caring for patients. Available at https://www.gmc-uk.org/-/media/documents/caring-for-doctors-caring-for-patients_pdf-80706341.pdf.
- Gilbert, 2013 Gilbert P. *The compassionate mind* London: Robinson; 2013.
- Gillies, 2017 Gillies J. Compassion, medical humanities and medical education. *Education for Primary Care*. 2017;29(2):68–70.
- Hall, 1997 Hall S. *Representation: cultural representations and signifying practices* London: Sage Publications; 1997.
- Haslam, 2015 Haslam D. More than kindness. *Journal of Compassionate Healthcare*. 2015;2:6.

- MSNFT, 2013 MSNFT. *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. The Francis Report* London: HMSO; 2013.
- NAM, 2019 NAM. *Taking action against clinician burnout: a systems approach to professional well-being* National Academy of Medicine 2019.
- Neff, 2015 Neff K. *Self-compassion* HarperCollins 2015.
- Newton et al., 2008 Newton B, Barber L, Clardy J, Cleveland E, O'Sullivan P. Is there hardening of the heart during medical school?. *Academic Medicine*. 2008;83(3):244–249.
- NSS, 2018 NSS, 2018. National Student survey results (online) October 2018. Available from: <https://www.thestudentsurvey.com/>.
- Riess et al., 2012 Riess H, Kelley JM, Bailey RW, et al. Empathy training for resident physicians: a randomized controlled trial of a neuroscience-informed curriculum. *Journal of General Internal Medicine*. 2012;27(10):1280–1286.
- Sinclair et al., 2016 Sinclair S, Norris M, McConnell SJ, et al. Compassion: a scoping review of the healthcare literature. *BMC Palliative Care*. 2016;15:6.
- Singer and Bolz, 2013 Singer, T., & Bolz, M. (2013). Compassion: bridging practice and science ebook <http://www.compassion-training.org/>.
- Society of Occupational Medicine and The Louise Tebboth Foundation, 2018 Society of Occupational Medicine and The Louise Tebboth Foundation. *What could make a difference to the mental health of UK doctors? A review of the research evidence* [Internet]. 2018. Available from: https://www.som.org.uk/sites/som.org.uk/files/What_could_make_a_difference_to_the_mental_health_of_UK_doctors.pdf
- Tools of the Trade Tools of the Trade(Dr Lesley Morrison (GP) Dr John Gilles (GP and Chair RCGP Scotland and Revd Ali Newell and Lili Fraser).
- Trzeciak and Mazzairelli, 2019 Trzeciak S, Mazzairelli A. *Compassionomics: the revolutionary scientific evidence that caring makes a difference* Studer Group 2019.
- Wear and Zarconi, 2008 Wear D, Zarconi J. Can compassion be taught? Let's ask our students. *Journal General Internal Medicine*. 2008;23.
- West and Markiewicz, 2016 West M, Markiewicz L. Effective team work in health care. In: Ferlie E, Montgomery K, Reff Pedersen A, eds. *The Oxford handbook of health care management*. Oxford University Press 2016;231–252.
- Worline and Dutton, 2017 Worline D, Dutton J. *Awakening compassion at work* Oakland: Berrett-Koehler Publishers; 2017.

The Patient as Educator

Gerard Flaherty and Robina Shah

Trends

- Doctor-patient relationships are moving from the traditional paternalistic model of passive patients to a more active engagement by patients, working in partnership with professionals.
- Students benefit from learning about the lived experience of patient-educators.
- Multiple levels of active patient involvement across the spectrum of medical education exist and sustainable approaches to patient-educator training are emerging.

Key concepts

- Patient-educators are individuals with a medical condition, mostly drawn from the lay public, who are given an active role in the education of health professional students.
- There are multiple degrees of progressively deeper patient involvement in medical education, ranging from the use of patients as case material for discussion to their participation as equal partners in curriculum planning and programme governance.
- Patients who teach require clear guidance on their expected role and should receive appropriate training without sacrificing the authenticity of the narrative based on their lived experience.

Introduction

The fundamental importance of clinical immersion in undergraduate medical education is globally accepted. Traditionally, medical students have developed and refined their consultation and physical examination skills by spending valuable time as individual learners or in small, often tutor-led, groups at the patient's hospital bedside. They observe how clinicians communicate with and counsel patients and they learn to appreciate patients' specific concerns and personal priorities. Various strategies have been proposed to preserve the humanistic element of student-patient interactions at the bedside ([Ramani & Orlander, 2013](#)). Despite this, patients have perhaps inadvertently been relegated to a somewhat passive educational role in most institutions. Their often supine posture on a hospital bed or examination couch is somewhat symbolic of the subservient role they have assumed in the medical school hierarchy, where the educational agenda, at least in the clinical phase of the programme, is typically set by medically qualified teachers with minimal input from real patients.



“Until recently, the role of patients in medical education has been passive, with them acting as interesting teaching ‘material’ – often no more than a medium through which or about which teachers teach.”

Ahuja and Williams (2005)

Greater participation of laypersons in the regulation of medical professionals, as well as the growing influence of patient advocacy organizations, has raised the profile of patient and public involvement in medical programme accreditation. Drivers of more active patient involvement in health professional education include a shift in government policy towards self-management in patients living with chronic illness; the adoption of patient-centred care by healthcare professionals; a greater focus on the value of shared decision making between patients and doctors; a consumerist approach in society which has helped to empower patients; and a desire by medical schools to engage more with their local communities ([Towle et al., 2010](#)). In the United Kingdom, both the [Department of Health \(2007\)](#) and the [General Medical Council \(2009\)](#) have issued recommendations for enhanced patient and public involvement in the National Health Service and in undergraduate medical education, respectively.

There is still a limited but emerging scholarship on this subject which was reflected in the elevation of ‘patient as educator’ as one of the central themes for the 2019 AMEE conference. Of the five invited plenary and symposium speakers addressing this theme, four were not medically qualified and three related powerful personal experiences as patients or their carers. This chapter will build on the momentum generated by these interactive sessions. By becoming more familiar with the background literature and by learning about existing models of best practice, the educator will be in a stronger position to evaluate his/her own medical school's approach to patient involvement and

implement changes which may have a positive influence on students' learning and, ultimately, on patient care.



"The term 'patient-educator' is the general term used to refer to a person with a health condition who is involved in the education of students."

Lauckner et al. (2012)

Patient and public involvement

Good communication skills are key to the development of a grounded and open doctor-patient relationship; however, it is the construct of conversation combined with patient partnership that requires the greater skill, situational awareness and expertise. Performed well through the lens of the patient and in partnership with the healthcare professional, it can transform the patient's lived experience from being a passive recipient of healthcare to becoming an active participant with informed choice, better health outcomes and a voice that is valued.

Working, collaborating, involving or engaging with patients, carers and the public is often referred to as 'patient and public involvement' (PPI). Many organizations in the healthcare sector, such as the [Health and Care Professions Council \(2014\)](#), the [National Midwifery and Nursing Council \(2010\)](#), the UK [General Medical Council \(2009\)](#), the [National Institute for Health Research \(2020\)](#) and NHS Foundation Trusts ([Kings Fund, 2005](#)), require PPI to be evidenced as part of good governance, public accountability, continuing professional development and professional practice. However, the definition, terms of reference, role description and characteristics that describe how healthcare professionals demonstrate PPI in these areas vary across the healthcare sector and in undergraduate medical education.

Patient and public involvement in medical programme accreditation

In the United Kingdom, the General Medical Council (GMC) requires medical schools to involve patients and the public in the delivery of its undergraduate medical programme. The GMC supplementary guidance, *Patient and Public Involvement in Undergraduate Medical Education* ([GMC, 2009](#)), illustrates how this may be demonstrated. Medical schools should ensure that their local engagement takes place for a clear purpose and is supported by a framework for recruitment, support, training and remuneration for those patients or public laypersons involved. Medical schools should ensure that a variety of innovative approaches to patient and public involvement and support are deployed, depending on the nature and purpose of involvement. Different experiences and areas of expertise of the local population should be used, including groups that are typically hard to reach.

Training and preparation of patient-educators

Patients or lay persons should be appropriately prepared for the role they are invited to perform. Medical schools should ensure that individuals understand and are comfortable with their role, are familiar with the expected learning outcomes of and consent to the encounter, and know who to contact if they find it difficult to continue. Some individuals, for example, those involved in students' formal assessment, may require more extensive training to ensure consistency of approach. A comprehensive support framework should be in place to meet the needs of the participants before, during and after the involvement encounter. This should include personal support, such as confirmation of arrangements for remuneration and transport, and identifying the contact person, general skills training, training specific to their role, and two-way feedback following the encounter.

Spectrum of involvement of patient-educators

Medical schools should consider whether there is scope for involving patients and the public in the selection of medical students, for example, by inviting them to contribute to the review of the selection process or interview questions, or to provide feedback on individual students' communication and interpersonal skills. Patients can contribute unique and invaluable expertise to teaching, feedback and assessment of medical students, which should be encouraged and facilitated.

Patient and public involvement in the development of curricula and assessments, governance and quality management and control is not yet the norm but there is great potential for development in these spheres. Attention should be given to the variety of perspectives that individual patients can bring. Schools should consider what expertise will best meet the purpose of engagement and call upon a range of approaches and sources to harness that expertise.

In their guidance document, [GMC \(2009\)](#) describes the progress that many medical schools have made with involving patients in assessments and feedback. Furthermore, a review of the literature in healthcare, albeit limited, shows that where good models of PPI are being used this can lead to improved patient outcomes, as well as enhancing student satisfaction, skills and confidence ([Towle et al., 2010](#)).

A systematic review of patient service user involvement in medical education by [Jones and Moss \(2019\)](#) supports this theme of variation and suggests that, although there are examples of how schools had consulted or involved patients and the public in curriculum development, teaching and admissions, there are fewer examples of schools using PPI in governance, leadership and management.

A study by [Monrouxe et al. \(2018\)](#) explores multiple stakeholders' perceptions of newly qualified medical graduates and their conceptualizations about what it means to be prepared for clinical practice. This study also included patient and public representatives, as well as policy and government officials. A noteworthy finding was that simulation-based learning was 'deemed inadequate for communication preparedness, because of the unpredictable nature and complexity of real life interactions.' To address this limitation, [Monrouxe et al. \(2018\)](#) suggest that medical educators should consider using [Eraut's \(2004\)](#) unstructured informal learning in the workplace approach to prepare final-year medical students for their transition to the public facing world of healthcare services. This can only be achieved if members of the public and not just 'expert' or simulated patients alone are also involved in training future doctors.

Educational value of involving patients as educators

Patients who teach medical students benefit from applying their lived experience of illness in a positive way and many will feel personally fulfilled at being in a position to give back to the profession and health system which provided their care. Discussing their illness with students may create a sense of patient empowerment and provide insights that will help them to cope better with the demands of their condition and its management.

For learners, the value of involving patients as teachers can be readily appreciated. They gain access to authentic, patient-centred knowledge and experience in relation to their condition and use of health services. Students regard learning experiences provided by patients as more powerful, engaging, and transformative than those available in their standard curriculum (Rees et al., 2007). Patient-educators, by giving an account of their real-life experiences, provide valuable context to medical students' learning (Jha et al., 2009). Patient-educators are well placed to provide constructive feedback to students on their communication skills and approach to physical examination. Receiving this timely feedback and attending more closely to the patient perspective will assist in the development of empathy in medical students and contribute to their professional identity formation.

Learners may feel less anxious in the presence of patient-educators and this may help them to grow in confidence and enthusiasm for their learning. Thus patient-educators may serve a vital role in remediating struggling students and in reducing attrition rates from medical school programmes. Exposure to patients as teachers may have a positive effect on learners' attitudes and behaviour and engender greater respect for patients and their innate capacity for healing. Early subscription to the model of equal partnership between doctor and patient may reap future dividends in terms of greater patient satisfaction and higher quality of patient care. Providing early patient-educator exposure in a given programme will be important before medical students become more entrenched in their views of the medical hierarchy and of patients' roles in it.



"...for learners, their understanding of patient-centred care and the humanistic aspect of the impact of illness on everyday life is enhanced, they report greater confidence in their own knowledge of examination and history taking skills and they enjoy sessions where patients/service users are involved."

Gordon et al. (2020)

Potential for expanded role of patients as educators

A hierarchy of patient involvement in health professional education has been proposed by [Towle et al. \(2010\)](#), ranging from the use of patients only as the focus of a case or clinical scenario to be discussed with a faculty teacher to the involvement of patient-educators at institutional level in decisions regarding educational policy and strategy ([Box 45.1](#)). The Doubleday Centre for Patient Experience at the University of Manchester (see case study) is an excellent example of high-level patient participation in medical education, where 'medical education partners' are engaged as copartners in the design, delivery, and governance of the undergraduate medical programme ([Wilkinson, 2018](#)). The US-based Society to Improve Diagnosis in Medicine, by partnering closely with patients, their families and carers, aims to eliminate harm resulting from diagnostic error in clinical practice. Patients with rare diseases acquire significant expertise and insights over a lifetime into these conditions which would benefit medical trainees at all levels.

Box 45.1

The six degrees of progressively greater patient involvement in education

1. Paper-based or electronic scenario
2. Standardized patient in a clinical setting
3. Patients shares experience with students in a faculty-directed curriculum
4. Patient-teachers involved in teaching, giving feedback to or assessing students
5. Patients as equal partners in instruction, evaluation and curriculum development
6. Patients engaged at institutional level in decision-making roles around policies

Modified from Towle et al., 2010.

[Solomon \(2011\)](#) qualitatively analysed students' perceptions of learning in a patient-led interprofessional education event and concluded that trained patient-educators are effective in facilitating interprofessional education. With so many barriers impeding the development of interprofessional learning in practice, the use of patient-educators to bridge this divide may prove a powerful tool in medical education. Other potential roles for patients as educational partners include involvement in curriculum design, student selection and mentorship, patient safety training ([Jha et al., 2015](#)), provision of feedback, assessment of reflective portfolios, clinical teaching space design and the codesign of educational conferences. The potential impact of doctors themselves recounting their experiences of being patients and navigating the health system has not been fully explored to date.

Case study: the Doubleday Centre for Patient Experience

The University of Manchester medical school provides informal learning as suggested by [Eraut \(2004\)](#) to its students through the Doubleday Centre for Patient Experience. The Doubleday Centre hosts the school's patient and public involvement strategy and is supported by members of the public referred to as medical education partners (MEPs). MEPs are involved in all aspects of the delivery, teaching, and governance of the school's medical education programme and actively contribute to a wide variety of taught and extracurricular medical education activities. [Fig. 45.1](#) illustrates the importance of medical education partners in underpinning the undergraduate medical programme.

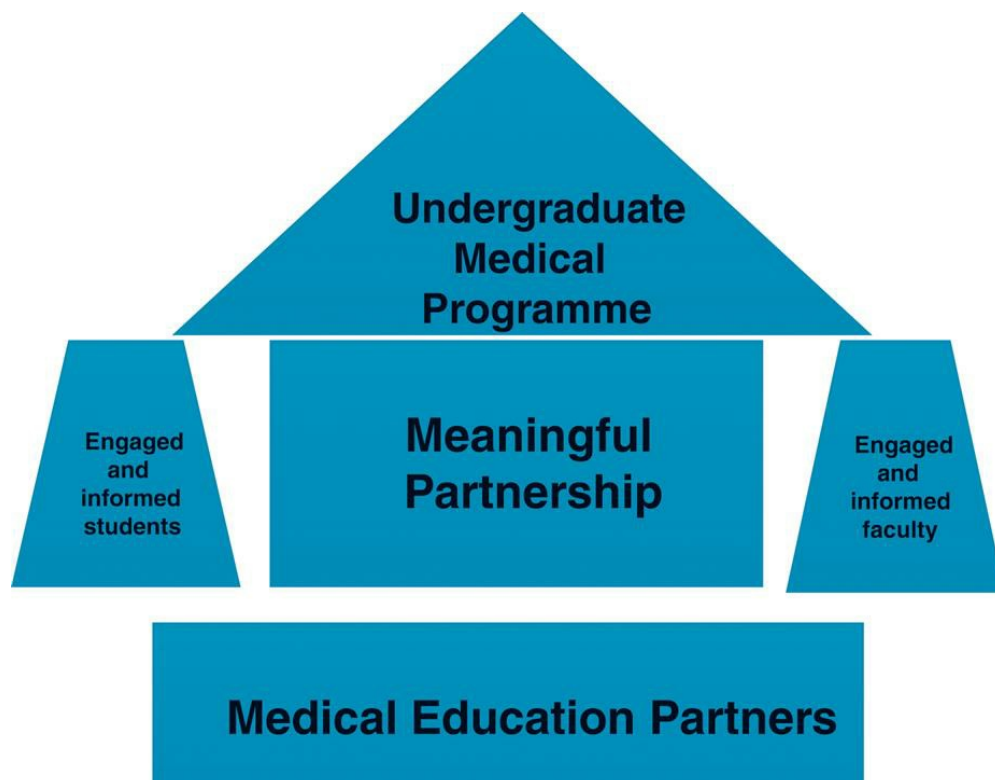


FIG. 45.1 The role of medical education partners in a patient and public involvement (PPI)-supported curriculum. A meaningful and purposeful partnership model of engagement sits at the heart of the Doubleday Centre and is instrumental in delivering person-centred care that is owned by students, staff and medical education partners.

The PPI strategy supports student learning through the appointment of national ambassadors with various senior leadership roles in healthcare, research and the voluntary sector. Their input has extended students' understanding of person-centred care and the importance of partnership in working with patients, service users and

family carers. Key to its model of engagement and PPI strategy is the appointment of student ambassadors who work in partnership with MEPs to design, plan and produce extracurricular programmes, including the annual Doubleday Lecture. Medical student ambassadors also work in partnership with MEPs to help shape and inform the importance of working in partnership with patients and promote wider student learning about person-centred care through the Doubleday Centre for Patient Experience Medical Student Society. The diverse roles of medical education partners are presented in [Box 45.2](#).

Box 45.2

Roles of medical education partners at Manchester medical school

- Medical student progression committee
- Medical student admissions
- Medical student assessment committee
- Programme governance committee
- Teaching and learning committee
- Curriculum committee
- Medical students society funding committee
- Medical student health and conduct panels
- Direct student teaching and learning
- Wider public engagement activities
- Supporting faculty PPI activities
- Doubleday Centre for Patient Experience Medical Students Society

PPI, Patient and public involvement.



"The best retention rates are achieved by programmes that involve patients in planning, acknowledge their involvement and regularly update them on programme and student progress."

Towle et al. (2010)

A key challenge for the Manchester medical school was to ensure that the PPI strategy and its model of partnership and engagement with staff, students and the MEPs was clear, realistic, relevant and valued. This was achieved by creating a community of practice that produced a shared definition of PPI in terms of its role, function and purpose about what that partnership should look like and how it would be integrated and sustained across the undergraduate medical programme. Although the Doubleday Centre has been recognized nationally ([Wilkinson, 2018](#)) and internationally ([Institute for Healthcare Improvement, 2020](#)) for strong leadership in

this area, it is important to pause, reflect and evaluate how this journey has impacted upon students' understanding of PPI and their understanding of how PPI has shaped and informed their approach to working in partnership with patients to achieve better patient outcomes, including their preparedness for clinical practice.

There remains a need for medical schools to agree a common definition of PPI that can be evaluated consistently across medical education institutions. However, in the absence of a shared definition, how PPI is evaluated and evidenced will be institution specific. This approach may not adequately reflect the true contribution that PPI makes in the teaching of medical students, doctors and other healthcare professionals, especially its impact in improving patient outcomes and the patient experience.

Challenges facing patient-educator programmes

The confusing terminology which surrounds patient-public involvement in medical education, with an array of descriptive labels used by different authors and institutions (Lauckner et al., 2012), does little to encourage academics wishing to facilitate greater patient involvement in medical education. A dearth of high-quality research evidence of the long-term benefits of this approach (Jha et al., 2010) may constrain faculty champions in their efforts to garner support in embedding patients as educators on their programmes. Concerns for patient-educators' emotional wellbeing and stamina have the potential also to limit faculty enthusiasm for their participation (Wykurz & Kelly, 2002). Local factors may interfere with patient recruitment, and retention of patient-educators from year to year will also challenge course developers. In the absence of a standardized approach to patient-educator training, faculty will lack guidance and run the risk of 'overtraining' of patients such that their narratives begin to lose authenticity.



"Typical academic training may lead patients to act as 'quasi academics'; they may lose the authentic voice and unique world view that distinguishes them from professional educators."

Towle and Godolphin (2011)

There is disagreement in the literature about whether patient-educator training should be peer-led or faculty-led (Cheng & Towle, 2017). Funding approaches vary across existing programmes, from voluntary participation to full payroll remuneration but coverage of travel and subsistence expenses is likely to be required in most cases. Training costs are likely to be recurrent given the high expected turnover of patient-educators resulting in a lack of amortization compared with conventional physician-educators (Walsh, 2012). The risk of professional boundaries between physicians and their patients becoming confused with patient-educators expecting preferential treatment is probably only a theoretical concern but should be acknowledged by course designers. A summary of the challenges facing patient-educators is presented in [Box 45.3](#).

Box 45.3

Challenges of patient-educator involvement

- Lack of knowledge of educational context
- Lack of formal preparation and support from faculty
- Overcoaching resulting in loss of realism and engineered responses
- Anxiety and distress resulting from repeated narratives of traumatic events

'Professionalization' of patient-teachers from repetition of their stories
Lack of integration into the educational programme
Tokenism on the part of curriculum committees
Exclusion of patient-educators from curriculum planning and assessment
Potential loss of welfare benefits if remuneration reaches certain thresholds

Future research opportunities

The long-term benefits of a deeper level of patient involvement in medical education remain to be established through rigorous and collaborative international research. Future qualitative research should involve patients and carers from ethnic minority and other underrepresented groups in society (Ahuja & Williams, 2005). Towle et al. (2010) have identified multiple examples of priority research questions in the patient as educator domain (Box 45.4). Patient involvement in the design and evaluation of such research initiatives will be essential to their success. Building a patient as educator theme as a longitudinal track in major medical education conferences will promote scholarship in this area and provide a platform for the dissemination of research findings in different settings across the world.

Box 45.4

Selected patient-educator research questions

Antecedent variables

What are the drivers of patient involvement in health professional education?
How do different countries differ in their approaches?
How do local factors influence what is feasible and effective?

Structural elements

What contributes to a comfortable patient-educator learning environment?
What safety issues affect student access to community-based patient-educators?
Does the educational setting influence student learning from patient-educators?

Processes

What are the continuing development needs of patient-educators?
How should conflicts between patients, students and faculty be managed?
What are the most effective educational interventions and assessments?
What are the ethicolegal implications of patient involvement?
What is the value of patient involvement in interprofessional education?

Educational outcomes

What are the short- and long-term effects on healthcare professionals?
What are the most appropriate outcome measures?
What are the long-term changes in postgraduate behaviours and attitudes?
What is the impact of patient involvement on institutional cultures?

What factors promote sustainable patient-educator programmes?

Modified from Towle et al., 2010.

Summary

The traditionally passive educational role of patients is being replaced by a deeper and more meaningful participation of patients in health professional education programmes. This has been facilitated by a number of factors, including accreditation pressures and a growing focus on patient-centred care. Medical schools are encouraged to use a variety of innovative approaches to patient and public involvement, depending on their local circumstances and the desired purpose of patient involvement. There is general agreement that patients should be appropriately prepared and trained for their expected roles.

The unique value of patient expertise in teaching, assessment and student feedback is increasingly being recognized. Higher level involvement in curriculum design, governance and policy formulation is desirable but not yet widespread. Students value the engaging, authentic and transformative potential of patient-led teaching events which provide context to their learning. The University of Manchester involves patients as medical education partners across the entire spectrum of undergraduate educational activity. Research efforts are hampered by the lack of a consistent definition of patient-public involvement. The longitudinal benefits of forging a deeper level of patient engagement in medical education require further evaluation but there is an emerging appreciation of the positive effects of patient-educators on the development of empathy and communication skills.

References

- Ahuja and Williams, 2005 Ahuja AS, Williams R. Involving patients and their carers in educating and training practitioners. *Current Opinions in Psychology*. 2005;18:374–380.
- Cheng and Towle, 2017 Cheng PTM, Towle A. How patient educators help students to learn: an exploratory study. *Medical Teacher*. 2017;39(3):308–314.
- Department of Health, 2007 Department of Health. *Patient and public involvement in the NHS* London (UK): House of Commons; 2007; Third report of session 2006-07.
- Eraut, 2004 Eraut M. Informal learning in the workplace. *Studies in Continuing Education*. 2004;26:247–273.
- General Medical Council, 2009 General Medical Council. *Patient and public involvement in undergraduate medical education*. London (UK): GMC; 2009.
- Gordon et al., 2020 Gordon M, Gupta S, Thornton D, et al. Patient/service user involvement in medical education: a best evidence medical education (BEME) systematic review: BEME Guide No 58. *Medical Teacher*. 2020;42(1):4–16.
- Health and Care Professions Council, 2014 Health and Care Professions Council. *Role brief and requirements for lay visitors* London: HCPC; 2014.
- Institute for Healthcare Improvement, 2020 Institute for Healthcare Improvement (2020). Making medical education more patient-centered. Available at: http://www.ihl.org/education/ihlopenschool/blogs/_layouts/15/ihl/cookieList=9f16d15b-5aab-4613-a17a-076c64a9e912&ID=216 (Accessed 19 January 2020).
- Jha et al., 2015 Jha V, Buckley H, Gabe R, et al. Patients as teachers: a randomised controlled trial on the use of personal stories of harm to raise awareness of patient safety for doctors in training. *BMJ Quality and Safety*. 2015;24:21–30.
- Jha et al., 2009 Jha V, Quinton ND, Bekker HL, Roberts TE. What educators and students really think about using patients as teachers in medical education: a qualitative study. *Medical Education*. 2009;43:449–456.
- Jha et al., 2010 Jha V, Setna Z, Al-Hity A, et al. Patient involvement in teaching and assessing intimate examination skills: a systematic

- review. *Medical Education*. 2010;44:347–357.
- Jones and Moss, 2019** Jones L, Moss F. What should be in hospital doctors' continuing professional development?. *Journal of the Royal Society of Medicine*. 2019;112:72–77.
- Lauckner et al., 2012** Lauckner H, Doucet S, Wells S. Patients as educators: the challenges and benefits of sharing experiences with students. *Medical Education*. 2012;46:992–1000.
- Monrouxe et al., 2018** Monrouxe L, Bullock A, Gormley G, et al. New graduate doctors' preparedness for practice: a multistakeholder, multicentre narrative study. *BMJ Open*. 2018;8(8):e023146.
- National Institute for Health Research, 2020** National Institute for Health Research, 2020. What is public involvement in research? Available at: <https://www.invo.org.uk/find-out-more/what-is-public-involvement-in-research-2/> (Accessed 19 January 2020).
- Nursing and Midwifery Council, 2010** Nursing and Midwifery Council. *Standards for pre-registration nursing education* London: NMC; 2010.
- Ramani and Orlander, 2013** Ramani S, Orlander JD. Human dimensions in bedside teaching: focus group discussions of teachers and learners. *Teaching and Learning in Medicine*. 2013;25(4):312–318.
- Rees et al., 2007** Rees CE, Knight LV, Wilkinson CE. "User involvement is a sine qua non, almost, in medical education": learning with rather than just about health and social service users. *Advances in Health Sciences Education*. 2007;12:359–390.
- Solomon, 2011** Solomon P. Student perspectives on patient educators as facilitators of interprofessional education. *Medical Teacher*. 2011;33:851–853.
- The Kings Fund, 2005** The Kings Fund. (2005). Governing Foundation Trusts: A new era for public accountability. Available at: <https://www.kingsfund.org.uk/publications/governing-foundation-trusts> (accessed 28 January 2020).
- Towle et al., 2010** Towle A, Bainbridge L, Godolphin W, et al. Active patient involvement in the education of health professionals. *Medical Education*. 2010;44:64–74.
- Towle and Godolphin, 2011** Towle A, Godolphin W. A meeting of experts: the emerging role of non-professionals in the education of health professionals. *Teaching in Higher Education*. 2011;16:495–504.
- Walsh, 2012** Walsh K. The full costs of patient educators. *Medical Teacher*. 2012;34:509–513.
- Wilkinson, 2018** Wilkinson E. The patients who decide what makes a good

doctor. *British Medical Journal*. 2018;361:k1829.

[Wykurz and Kelly, 2002](#) Wykurz G, Kelly D. Developing the role of patients as teachers: literature review. *British Medical Journal*. 2002;325:818–821.

SECTION 7

Students & Trainees

OUTLINE

- 46 Selection of Students and Trainees
- 47 Students and Trainees in Need of Additional Support
- 48 Student Engagement in the Educational Programme
- 49 Professional Identity and Career Choice

Selection of Students and Trainees

Kevin W Eva

Trends

Selection is becoming recognized as the earliest moment at which potential students get a first-hand glimpse regarding what is valued by the profession and what one needs to do to succeed within its training programmes.

Implicit messages conveyed by, and unintended consequences resulting from, our admissions processes can no longer be overlooked.

Recent work suggests we can be better: better at identifying students who are most likely to display the professional ideals we strive to encourage, nurture and maintain; better at recognizing the strengths of applicants who have had lesser degrees of privilege; better at being socially accountable by considering cultural and geographic workforce issues; and, better at thinking in terms of systems that can create synergy between selection and later stages of training and practice.

Key concepts

- Academic versus professional characteristics: an oversimplified dichotomy used to encapsulate the variety of qualities the health professions value. The pairing, generally reflecting intellectual aptitude and interpersonal abilities, avoids the prevalent dichotomy into cognitive versus noncognitive characteristics that is erroneous because the qualities commonly assigned to the latter category (e.g., communication skills, compassion) require cognition.
- Cost versus cost effectiveness: a dichotomy used to reflect the dangers of deciding what selection processes will be used based on the resources required as opposed to considering the resources spent in conjunction with the benefits achieved.
- Selection systems: the admissions process as a whole, incorporating preselection efforts to encourage applications (through pipeline programmes, for example), the deliberate and judicious use of particular assessment tools, and postselection support of matriculants.
- Trait versus state: an enduring characteristic that an individual possesses (and thus demonstrates regardless of context) versus a temporary way of behaving, thinking, or feeling that is influenced heavily by the particulars of a situation.
- Validity: a construct reflecting the extent to which evidence exists that facilitates the interpretation of data. Modern frameworks suggest validity to be a matter of argumentation, identifying data that will allow empirical testing of assumptions to define limits that should be imposed on how scores are used to guide decisions.
- Wicked problems: a type of problem that may be impossible to solve given that its complexity causes each solution attempt to reshape the problem in a way that creates other issues or makes them more prominent.

Introduction

Let's get the bad news out of the way first. If you are reading this chapter, it is likely because you require entry into the international support group for battered and bruised admissions officers (ISGBBAO). If you are deeply involved in selection and do not need this group, do not feel left out; you will eventually.

I am sorry to start out with this note of pessimism, but empowerment and resilience come from acceptance of three realities: (1) selection is destined to be flawed; (2) blame will often be laid at the feet of the admissions office; and (3) perfect consensus on what is 'right' is unachievable. It is insufficient to recognize that mistakes can be made. Rather, we need to know mistakes will be made. The critical questions are: "What types of mistake can we live with?", "What logic justifies that conclusion?" and "How can we remain engaged in continuous quality improvement?".

Therefore this chapter is constructed to look at five types of error that commonly arise when managing selection processes. Some are inescapable because selection is a 'wicked problem' (Cleland et al., 2018). Others occur because human behaviour is complex, precluding perfect prediction. Our purpose, therefore, is to define and explore the implications of various errors in an effort to enable informed decision making regarding what can be controlled, where we are limited to doing the best we can, and what efforts can be anticipated to misuse limited resources.

The sections are sequenced roughly from considerations of logic to considerations of logistics although I intend for the boundary between principles and practice to be blurry. This is not a simple 'how to' manual because any such document would oversimplify the inherent challenges; what is right depends on context. Rather, the chapter is intended to provide a 'practical guide' by facilitating thinking about how to best match the possibilities to the institution's values, resources, and other constraints.

Errors of ignorance

Errors of ignorance are those that derive from blindly following an historical path without giving due consideration to changes in knowledge and society. These mistakes may not be acutely obvious, but they can have considerable influence on the overall culture, reputation, and impact of the institution. They present in practice through expressions like: “We get good applicants, so why worry about selection?” and “If it ain’t broke, why fix it?” The conclusion implied (to not change) might be justifiable. Too often, however, the questions reflect reflexive and unintentional adoption of a narrow, and potentially detrimental, view of selection practices.

Consider this case:

A school selects students exclusively based on academic achievement, has a high graduation rate, and its students generally pass the licensing examinations required to move onto their next stage of training. Therefore it concludes all is well.

Why should this institution consider expending resources to do anything other than what it has been doing so successfully? The answer lies both in whether the school has data to capture other outcomes of priority and in whether the school is content to live with unintended consequences that can arise from this policy.

As understanding of healthcare has evolved, educational institutions and regulatory authorities have come to recognize it takes more than knowledge to be a good practitioner. Professional qualities like communication skills, compassion, and collaborative ability are now considered vital competencies. We often do not, however, have robust structures that reward those who perform well (or document those who perform poorly) despite knowing insufficient professional qualities cause many healthcare problems.

Lack of explicit emphasis does not simply result in passive acceptance of suboptimal professional behaviours; it actively reinforces the risk. Learners’ behaviour is understandably driven towards things that determine advancement. Our admissions processes are the first stage at which many are exposed to the implicit messages our assessment protocols convey regarding what is valued in, and valuable for, professional practice.

If we accept that academic achievement is sufficient for selection, we cannot be surprised when applicants perceive a strong knowledge base to be sufficient for practice; we cannot complain if we end up with students who pursue performance rather than mastery; we should expect trainees to prioritize studying over clinical experience; and, we can anticipate wellness issues as students stress over the academic heights that determine achievement of their career goals.



Tip

Keep the end in mind. When designing a selection system, consider not only what is meant to be achieved in the short term, but how the admissions protocol, educational practice, and long-term goals of the institution can be made more synergistic. Doing so requires explicit consideration of the implicit messages being conveyed at each stage of training and continuous quality improvement involving deliberate collection of outcome data that are relevant rather than simply those that are available.

This is not an issue of whether selection is more essential than good curriculum given that professional qualities can be taught. Rather, it is a question of how we create an integrated continuum between selection, training, assessment and practice requirements that, from the outset, directs professionals towards good practice. Answering that question requires consideration of purposes other than measurement of candidates.

Errors of purpose

Errors of purpose are those that derive from insufficient consideration of the multiplicity of goals a selection process can serve. Most commonly we think of selection as a task for identifying the candidates most capable of developing the competencies expected of health professionals. That is laudable, but it is a mistake to believe it to be the only goal. Given that ‘assessment drives learning,’ we can strive to steer applicants in directions that offer personal and professional development and serve the greater good of society. It requires us too, however, to recognize the opportunity to achieve in whatever reward structure we create may not be evenly distributed across the population.

Consider this case:

Jane is considered more meritorious than Joan because her transcript reveals higher grades and she has travelled the globe engaging in humanitarian efforts. She is offered admission because her life experience is so impressive.

In a world in which bias, discrimination, and conflicts of interest create inappropriate advantages, it seems self-evident to say selection should be based on merit and that Jane should therefore be given greater opportunity. What could be fairer than selecting from many applicants to fill few positions based on merit rather than preferential treatment? Well, what if our means of defining merit is itself a source of preferential treatment (i.e., if Joan appears better because she has already had more opportunity)?

Not all forms of privilege are as direct in their impact as socioeconomic advantage, but if Jane’s family is wealthier than Joan’s, it is easy to understand why their CVs will look different. Economic disadvantage can impact Joan’s academic success, her capacity to display professional characteristics in easily recognizable ways, and the likelihood she would ever aspire towards medicine ([Southgate et al., 2015](#)). It is a mistake, however, to assume Joan’s life experience is less valuable given that what one does is far from a guarantee of what one learns. Further, we err when we do not consider the need for Joans in healthcare as diversity of experience and perspective contributes valuably to students’ learning and creates awareness of sociodemographic influences on health.

As we become more aware of the influence created by one’s circumstances, we must become better at critically examining how selection processes contribute to the propagation of social advantage ([Razack et al., 2020](#)). As we become more aware of the variable health needs of subpopulations, we must become better at understanding how selection processes influence our social accountability. Doing so requires creating a system aimed at accomplishing a variety of goals and broadening consideration of the array of factors we use to determine which candidates are ‘best’. This can include creation of pipeline programmes to increase the rate of competitive applicants from underrepresented groups preselection, implementation of differentiated policies for high-priority groups during selection, and providing postselection support for needed

social and academic adjustments (e.g., [Girotti et al., 2015](#)).

If we accept that the best candidates are those who demonstrate their merit through achieving high test scores or engaging in life experiences that are inaccessible to others, we cannot care about whether there are perfectly capable applicants with diverse backgrounds and other forms of excellence who could enrich the learning environment yet are excluded because their own lack of privilege prevents them from competing effectively; we should not be surprised when our classes are disproportionately represented by majority groups from large urban areas; further, we should not be surprised when our graduates show disinterest in practising in underserved communities to which they have no personal ties.



Tip

Remember the whole is greater than the sum of its parts. Although the logistics of collecting data to rank order individuals in a meaningful and effective way can seem overwhelming by itself, it is equally important to focus upon how well your admissions process generates a group of successful applicants that represents the population it is selected to serve. Consideration of how to widen access to historically underrepresented groups has demonstrable benefit even though the problem is far from solved (Mathers et al., 2016).

Whatever purposes an institution prioritizes, turning the characteristics it desires into data about individuals that can be used to accomplish its goals is a challenge that will require compromise. Resources are not infinite and there may be some things we think exist that are not measurable. Here we must take care to avoid being misled by errors of conception (i.e., mistakes made by holding a faulty view of what is achievable and at what cost).

Errors of conception

The utility of selection processes being defined by compromise places it in the same camp as any other assessment protocol as we must always weigh the robustness of information gathered and behaviours encouraged against their cost. We mistakenly conceive of this process, however, when we think purely in terms of cost rather than cost effectiveness (i.e., what can be measured, at what expense, and at what cost if we fail to do so well?).

Consider this case:

The Dean, struggling to sustain the viability of the medical school, decides to cease interviews to lower expenses. This is broadly accepted as a financially responsible strategy with a clear impact reflected on the school's bottom line.

Hidden in this case is the degree to which the costs the Dean avoids might covertly transfer to other sections of the budget. There are relatively few cost evaluations examining educational practices partly because costs are context specific and partly because it is difficult to convert many relevant outcomes to a common (typically financial) metric. The natural experiment that has recently taken place in The Netherlands as schools transition away from selecting purely via grade-based lottery has, however, generated comparative data. At Maastricht, for example, mounting a more elaborate selection system cost roughly 500 euros per student. At the same time, it saved roughly 750 euros per student through drop-out prevention and other costs associated with struggling learners ([Schreurs et al., 2018](#)). More general research examining the costs of failure indicates that financial impacts are felt by students, government, educational programmes, and health services ([Foo et al., 2018](#)). It is unlikely, however, that the costs of poor decision making in selection are strictly monetary.

If we accept cost barriers without consideration of cost-benefit ratios, we should anticipate setting weaker individuals up to fail; we can expect to demotivate the clinicians who provide their education; and we risk patient safety and satisfaction by exposing them to ill-suited trainees.



Tip

Do not expect a return without an investment. Without careful cost management any system can quickly outgrow its usefulness. Considering the case for cost effectiveness, however, requires thoughtful exploration of what costs are incurred if resources are not invested to create a better system.

Unfortunately, myopic views on costs associated with admissions is not the only aspect of selection by which we tether ourselves with inaccurate intuitive models of the

world. Rather, we reveal additional errors of conception in the way we commonly talk about candidates as people who ‘possess’ certain traits. In doing so, we fail to account for the complexity of human behaviour, thus misleading our decision making.

Consider this case:

Justin is a talented swimmer whose dedication, tenacity, and grit enabled him to have an Olympic career. During interviews he presents as a very confident young man who possesses admirable qualities that can undoubtedly be helpful during medical practice. The admissions committee is wholly assured Justin has the work ethic to enable success.

Should they be? Human behaviour is known to be context specific (Eva, 2003). Being a hyperdedicated swimmer, therefore does not guarantee Justin will be a hyperdedicated physician. As a result, terms like ‘tenacious’ or ‘confident’ should not be deemed characteristics he possesses but are best thought of as descriptors of how he has behaved in specific situations. In this instance, the labels are at particular risk of being nongeneralizable because they were generated from a single context. We know the learning that enables such qualities is more robust when it occurs in a variety of situations. This is why, according to Epstein (2019), early success is not always predictive of long-term performance: “the more contexts in which something is learned, the more the learner creates abstract models, and the less they rely on any particular example.”

Furthermore, we must be careful about overinterpreting the value of any desirable characteristic given that there will be context-dependent limits to the benefits they provide. Confidence is beneficial to empower action, but too much becomes arrogance with all the negative connotations that term implies. Too much tenacity becomes an unwillingness to accept feedback; too much drive becomes myopia; and too much dedication creates a recipe for burnout.



Tip

Use them to guide prioritization, but take care to not reify constructs. Designing a selection system that is better at identifying candidates who are more likely to demonstrate the qualities we desire requires contemplation of ways in which our natural language (using words like skill or characteristic) can misdirect our decision making regarding what data are to be trusted and how they should be used.

Although many debates about the use of language can appear to be matters of semantics with little practical importance, the distinction between measuring someone’s character and the qualities they display in a particular situation carries considerable implications for how we might optimize admissions decision making; as outlined later, it can help us prioritize spending resources in ways that maximize the benefits they yield, thus improving their cost effectiveness. Without a clear distinction, it is easy to make errors of implementation that can very quickly turn dedicated, expensive, and well-intentioned selection practices into nothing more than elaborate lotteries

(Kulatunga-Moruzi & Norman, 2002).

Errors of implementation

If one cannot meaningfully attribute characteristics to candidates in a generic manner, then how can we possibly carry out a task aimed at identifying individuals who will demonstrate the qualities we expect of clinicians? I am not going to review the evidence in favour (or against) any one selection methodology for two reasons: (1) there are consensus statements published that do that well enough ([Patterson et al., 2018](#)); and (2) anyone who tells you their tool provides a 'true measure' of complex behaviours or the capacity to gaze into candidates' intrinsic values and underlying belief systems should be considered a snake oil salesman. Models of validity have evolved over recent decades, but everyone makes it clear that a measurement instrument cannot be considered universally valid. That said, although it is insufficient to believe any one selection model is guaranteed to provide meaningful representation of candidates' likelihood of success, there are general principles that can offer guidance.

Consider this case:

Evidence-Based University (EBU) has decided to select students based on an equal balance of academic achievement (measured by grade point average [GPA]) and professional qualities (measured by multiple mini-interviews [MMIs]). Not all courses are created equal, so a weighting scheme gives greater credit to particular courses. Because the school has historically interviewed people by having three examiners meet with each candidate for 30 minutes they divide their interviewers into 3×10 minute MMI stations. To create the desired balance, they multiply GPA and MMI scores by 50% and add them together to create a rank ordering of candidates before heading off to a nice restaurant to celebrate a job well done.

This case provides an opportunity to compare and contrast common features of academic and professional quality measures at the same time as contemplating how they can be unintentionally misused. Prior academic achievement has long been known to be the best predictor of future academic achievement ([Patterson et al., 2018](#)). Although imperfect, such metrics are valuable because they generally represent an accumulation of evidence, gathered over time, from a variety of contexts. As a result, although some courses will be harder than others, if a large enough sample of achievement is collected, differential weighting of courses or years of study generally makes little difference ([Trail et al., 2008](#)).

Professional quality measures most schools can collect are quite different. They are generally gathered at a particular point in time, within a particular context, from particular observers and, hence, do not reflect an accumulation of observations in the same way. MMI processes remain limited in such regards, but they were developed to enable greater sampling of behaviour from a wider array of perspectives than is available from panel-based interview formats ([Eva et al., 2004](#)). As a general rule, the more sampling one does, prioritizing independence of observation and diversity of perspective, the better the measurement properties become. Three 10-minute interviews

therefore can be expected to yield better test-retest reliability than a single 30-minute interview (Eva et al., 2004). However, if the 90 minutes of interviewer time historically used by EBU were spread out to gather data from nine 10-minute interviews, even greater reliability can be anticipated. That is not feasible in all situations, but the distinct forms of implementation should provide a reminder that one cannot assume the structure of a process (or equivalent psychometric properties) based on its label.

The last learning point built into this case is that there are statistical properties of data that must be considered if the ranking is to reflect the stated philosophy. That is, the differing scales on which GPA and MMI scores are typically collected prevent them from simply being added together to reflect equal weighting. For example, if GPA were recorded on a 4-point scale with an eligibility threshold of 3.5 and MMI scores were collected by having 12 people each assign ratings on a 10-point scale, then adding GPA to MMI scores effectively amounts to adding a constant to a variable and guarantees MMI scores become the ultimate determinant of overall ranking. Regardless of what stance one takes regarding the correct balance, z-scores are required to convert data to a consistent metric and to avoid mistakenly using a process that is incongruent with the school's stated principles. Judging the right balance to be 50:50, in other words, is not a mistake as long as the proportions are deliberately set to fit the institution's values. There are, however, many ways in which judgment can be used incorrectly, which is the focus of the final set of errors that will be considered.



Tip

Track the devil that lies in the details. Admissions offices must be prepared to operate at multiple levels, considering the principles and values they intend to represent through their admissions processes at the same time as tracking whether or not data collection, aggregation, and use properly align in a manner that puts those principles into play. Data manipulation can be automated, but statistical expertise should be sought to ensure that the algorithms are established correctly if such expertise is not available in house.

Errors of judgment

Medical education has a long history of tension between striving to improve fairness through objective assessment processes and efforts to recognize the added value judgment can provide to capture the breadth and nuance of relevant competencies. Nowhere is this more pronounced than in selection practices given that there are dozens of qualities the profession has identified as being important, most of which are not amenable to objective classification ([Albanese et al., 2003](#)).

This is one of the (better) reasons that so many medical schools use interviews to select candidates. It is also why many invest heavily in file review committees to finalize their decision making; there are exceptions to every rule that need consideration. The former (interview) practices are aimed at understanding who a candidate is rather than what they have done. The latter (file review) practices are aimed at ensuring those who do not fit the common mold are given sufficient opportunity. Recognizing the importance of judgment, however, is not the same thing as using it well. There are many obvious ways in which judgment can be mistaken (e.g., lack of sufficient attention), but there are also unfortunately many ways in which we can be caught unaware of how limitations in judgment mislead our decision making.

Consider this case:

Dr. Jones, a well-trained and highly functioning general practitioner, with considerable experience gathering patient narratives, spends 45 minutes interviewing each of three candidates. She forms a particularly positive impression of Anna, given her thoughtful responses and rich life experience. The two develop a fast rapport and Dr. Jones recommends Anna be admitted. The review committee, knowing Dr. Jones to be a stringent marker, considers her glowing recommendation worthy of overruling the 50:50 algorithm because Anna's GPA seems to underrepresent her potential.

Again, each of these judgments might be absolutely correct. The focus we have tried to maintain in this chapter, however, is what we should expect in general to avoid amplifying problems that arise when we are wrong. The real problem worthy of discussion, therefore, is not Dr. Jones' opinion about Anna, but the confidence she has in her impression. As Gladwell eloquently says in his book *Talking to Strangers* ([2019](#)), "Looking into someone's eyes does not reveal their soul." It is difficult to spend time with someone and not feel like we have learned something about who they are. The robustness of context specificity (already discussed), however, indicates that the best we can learn is something about who they were in the moment of that interaction. And the extent to which our own backgrounds and biases influence our impressions creates risk that we unintentionally and problematically learn more about the interviewer than the interviewee ([Harasym et al., 1996](#)). Reducing errors of judgment on the part of our interviewers requires simplifying the task we require of them, enabling them to generate a more robust impression of the variety of responses candidates might offer, and diluting the influence of individual judgments by sampling the impressions of

many people with diverse backgrounds (Eva, 2018). Reduction of judgment-induced error does not occur through efforts to make raters more objective, more comprehensive or by asking them to spend more time with each candidate.

At the level of the review committee, the important error in judgment is similarly not the one that seems most evident. Yes, the committee was particularly swayed by Dr. Jones' impression, relying on data that may be flawed. The real issue here, however, lies in consideration of whether the committee should be overruling the rank ordering generated by the algorithm at all. There are undeniably exceptions to every rule; the rules, however, define the most likely scenario and one should not assume that all changes are for the better. If the algorithm is correct 80% of the time, for sake of argument, only 20% of decisions will be wrong, yielding base rates that suggest there is a four times greater risk of the right being made wrong than there is of the wrong being made right. An expansive literature comparing committee-based decision making to actuarial (i.e., data-based) decisions long ago revealed that the latter wins quite robustly (Dawes et al., 1989).

This is not an argument to eradicate judgment. Rather, it is an argument to use judgment to set the algorithm (or algorithms if differential processes are to be used for applicant subgroups) and then let the computer do its work. The less data we have available to guide development of the algorithm, the more likely it is to make mistakes. However, the best we can do is gather the principles, perspective, and evidence available to the selection committee and define what best captures their judgment about how to most appropriately make selection decisions. Once that is done, the circumstances should be fairly extreme before one overturns the general rule to account for individual idiosyncrasies. If the algorithm is reviewed by the committee annually as more local data and more literature-based evidence become available, adjustments can be made that hopefully lead to continued refinement. It is at that policy-setting stage, however, that the bulk of a committee's judgment should have influence.



Tip

Accept that mistakes are inevitable while recognizing that some are worse than others. The least controversial thing I could write is that human judgment is fallible. We are always biased by our own background, our own perspective, and our own blind spots. Overcoming this, however, is not achieved by fixing our judges. It is overcome by creating systems that reduce reliance on the judgment of individuals (e.g., taking advantage of the wisdom that comes from aggregating independent judgments from diverse groups of individuals) and by not falling into the trap of believing that committees yield special insights.

Summary

In domains like aviation, where safety systems can be improved, where limited variation in circumstances exist, and where training processes can be made more intense, it is reasonable to strive for a 100% success rate. Despite dramatic and saddening examples to the contrary, that is nearly achieved. Student selection, however, is a domain in which error of many different types can occur with efforts to avoid one error often causing problems of a different type. As such, the error rate may be variable, but it is guaranteed to be nonzero. Nonetheless, consideration of the types of errors that can impact upon a selection process lead to a variety of practical tips, as have been highlighted throughout this chapter.

Those tips sum together to move our contemplation of selection tasks from identifying a means for considering 'how we identify the best students,' to identifying a means for considering 'how we best select students in ways that align with our values and the ideals we are striving to achieve.' Doing so is a moral imperative given that we use these systems to make life altering decisions on behalf of our applicants, the educators from whom they might learn, and the patients they could eventually serve ([Norman, 2004](#)). Striving for continuous quality improvement is a fundamental expectation we have of our health professionals; as a result, they should expect nothing less from us in terms of how we select who joins their ranks.

References

- [Albanese et al., 2003](#) Albanese MA, Snow MH, Skochelak SE, Huggett KN, Farrell PM. Assessing personal qualities in medical school admissions. *Academic Medicine*. 2003;78:313–321.
- [Cleland et al., 2018](#) Cleland JA, Patterson F, Hanson MD. Thinking of selection and widening access as complex and wicked problems. *Medical Education*. 2018;52:1228–1239.
- [Dawes et al., 1989](#) Dawes RM, Faust D, Meehl PE. Clinical versus actuarial judgment. *Science*. 1989;243:1668–1674.
- [Epstein, 2019](#) Epstein D. *Range: why generalists triumph in a specialized world* New York: Riverhead Books; 2019.
- [Eva, 2003](#) Eva KW. On the generality of specificity. *Medical Education*. 2003;37:587–588.
- [Eva, 2018](#) Eva KW. Cognitive influences on complex performance assessment: Lessons from the interplay between medicine and psychology. *Journal of Applied Research in Memory and Cognition*. 2018;7 177–188, 2018.
- [Eva et al., 2004](#) Eva KW, Reiter HI, Rosenfeld J, Norman GR. The relationship between interviewers' characteristics and ratings assigned during a multiple mini-interview. *Academic Medicine*. 2004;79:602–609.
- [Eva et al., 2004](#) Eva KW, Rosenfeld J, Reiter HI, Norman GR. An admissions OSCE: The multiple mini-interview. *Medical Education*. 2004;38:314–326.
- [Foo et al., 2018](#) Foo J, Ilic D, Rivers G, et al. Using cost-analyses to inform health professions education – The economic cost of pre-clinical failure. *Medical Teacher*. 2018;40:1221–1230.
- [Girotti et al., 2015](#) Girotti JA, Park YS, Tekian A. Ensuring a fair and equitable selection of students to serve society's health care needs. *Medical Education*. 2015;54:84–92.
- [Gladwell, 2019](#) Gladwell M. *Talking to strangers: what we should know about the people we don't* New York: Little, Brown and Company; 2019.
- [Harasym et al., 1996](#) Harasym PH, Woloschuk W, Mandin H, Brundin-Mather R. Reliability and validity of interviewers' judgments of medical school candidates. *Academic Medicine*. 1996;71:S40–S42.
- [Kulatunga-Moruzi and Norman, 2002](#) Kulatunga-Moruzi C, Norman GR. Validity of admissions measures in predicting performance

- outcomes: the contribution of cognitive and non-cognitive dimensions. *Teaching and Learning in Medicine*. 2002;14:34–42.
- [Mathers et al., 2016](#) Mathers J, Sitch A, Parry J. Population-based longitudinal analyses of offer likelihood in UK medical schools: 1996-2012. *Medical Education*. 2016;50:612–623.
- [Norman, 2004](#) Norman G. The morality of medical school admissions. *Advances in Health Sciences Education*. 2004;9:79–82.
- Patterson et al., 2018 Patterson F, Roberts C, Hanson MD, et al. Ottawa consensus statement: Selection and recruitment to the healthcare professions. *Medical Teacher*. 2018;40:1091–1101.
- [Razack et al., 2020](#) Razack S, Risør T, Hodges B, Steinert Y. Beyond the cultural myth of medical meritocracy. *Medical Education*. 2020;54:46–53.
- [Schreurs et al., 2018](#) Schreurs S, Cleland J, Muijtjens AMM, Oude Egbrink MGA, Cleutjens K. Does selection pay off? A cost-benefit comparison of medical school selection and lottery systems. *Medical Education*. 2018;52:1240–1248.
- [Southgate et al., 2015](#) Southgate E, Kelly BJ, Symonds IM. Disadvantage and the ‘capacity to aspire’ to medical school. *Medical Education*. 2015;49:73–83.
- [Trail et al., 2008](#) Trail C, Reiter HI, Bridge M, Stefanowska P, Schmuck M, Norman G. Impact of field of study, college and year on calculation of cumulative grade point average. *Advances in Health Sciences Education*. 2008;13 253–216.

Students and Trainees in Need of Additional Support

Rille Pihlak and Susannah Brockbank

Trends

- Increasingly pressurized environments and increasing curriculum demands for knowledge and skills make medical training more challenging now than ever.
- Support must be endemic as all learners are likely to experience periods of adversity.
- Struggling learners may present themselves in many different ways and difficulties are likely to be multifactorial.
- Less consistency in clinical teams makes assessing trainee wellbeing and making provision for support more difficult.
- Systems-level support is more beneficial than individual support.
- Formulating a holistic understanding of an individual trainee will help in providing appropriate and nonjudgemental support.

Key concepts

- 'Struggling' learner: a medical student or postgraduate trainee who has been identified as falling short of expectations. We intentionally use inverted commas as the individual learner is often not the problem, instead representing an individual having difficulty coping in a challenging context.
- Burnout: a state of emotional and cognitive overload resulting in an inability to function at the level required to meet the requirements of one's personal or professional life to a satisfactory degree.
- Identity dissonance: a mismatch between who an individual perceives they are and who they perceive they should be often based on sociocultural expectations.
- Formulation: an approach borrowed from Clinical Psychology to understand why a learner may be having difficulties that can be used to identify ways to support individuals and improve systems.

Introduction

The educational environment for students and trainees has evolved beyond recognition in recent decades; not only has medical knowledge increased exponentially but there are myriad ways in which learners can access this information ([Wynter et al., 2019](#)). Medical students are thus faced with a vast amount of information to learn, compounded by an imperative to make difficult choices about the quality of the learning resources available to them ([Judd & Elliott, 2017](#)). Furthermore, medical curricula have expanded beyond knowledge to encompass skills, such as effective communication, situational awareness, professionalism, teaching and leadership. Whilst much has been added, little has been removed, making the prospect of meeting the requirements of medical training more and more daunting.

In addition, the clinical environment is an increasingly complex one in which to train. So-called ‘multimorbidity’ and population growth increase the demands ([World Health Organization \[WHO\], 2019](#)), whilst lack of funding and staffing shortages common around the world mean that the workforce is struggling to keep up ([WHO, 2018](#)). From a trainee perspective, this translates into gaps in rotas and pressurized work environments. Overall, it is arguably more difficult to train to be a doctor than it ever has been.

Previous studies report that up to 28% of trainees ‘struggle’ ([Guerrasio et al., 2014](#)) and over half of physicians in the United States reported symptoms of burnout ([Shanafelt et al., 2015](#)). This is only the tip of the iceberg: it cannot capture those that fly under the radar, ‘struggling’ quietly and never coming to the attention of colleagues or trainers. Every medical student or trainee is likely to experience a period of adversity and thus mechanisms to support learners must be readily accessible and embedded across the spectrum of training. In this chapter, we will discuss how to identify learners in need of additional support and approaches to the assessment of learners and their learning context. We will also discuss potential strategies that can be used in the support of ‘struggling’ medical learners.



“Medical educators must be alert to the ‘struggling’ learner as trainees may come to their attention in many different ways.”

Identifying learners in need of support

Medical educators must be alert to the ‘struggling’ learner as trainees may come to their attention in many different ways. Though some learners may be the first to approach, requesting help and support, the competitive nature of medical training and the stigma associated with failure or illness mean that this remains relatively uncommon (Chew-Graham et al., 2003; Guerrasio et al., 2014). ‘Red flags’ include, although are not restricted to: a peer or senior colleague reporting a concern, a failed examination, a professionalism lapse, unexplained absences and poor clinical performance. Any red flag is, however, unlikely to tell the whole story and a detailed investigation is required to identify the roots of the problem, which may be multifaceted (Kalet & Chou, 2014).

Some authors recommend a ‘diagnostic’ approach to exploring problems, creating a list of ‘deficits’ (Guerrasio et al., 2014; Kalet et al., 2016). In our opinion, however, this approach has major flaws: it risks oversimplifying individuals, failing to fully account for the interrelatedness of issues and contextual factors; and it risks learners effectively being labelled as ‘diseased’. In Box 47.1, we present a worked example to illustrate the shortcomings of a ‘diagnosis of deficits’ approach.

Box 47.1

Example of the complexity of ‘struggling’ learners

Sally is an internal medicine trainee. She graduated from a local university and was always considered a ‘good’ student. She worked in a local hospital for the first 2 years of her training, which passed uneventfully. She often worked longer hours than her colleagues, describing herself as a ‘perfectionist’, but there were no concerns raised about her wellbeing or performance. She joined your training programme 6 months ago and was generally getting good reports from her trainers. She was referred to support services following an angry ‘outburst’ during a busy on-call shift.

When you interview Sally, she tells you that “things got on top of her” that day and that it will not happen again. She is extremely upset about the incident as it does not “represent the kind of doctor I want to be”. She mentions that she has recently failed a postgraduate examination. She tells you that she has never failed an examination before and feels “distracted” and “like a failure”. Sally has had difficulty telling her supervisor as she is worried that the supervisor will think she is “stupid”.

She knows she needs to start studying to take the examination again but is having difficulty finding the time. She finds the work environment difficult to cope with: she has always found work stressful but not to this extent. The on-call shifts are “relentless”, often because there are gaps in the rota that leave the team short of staff. She finds herself making decisions that she does not feel confident with because there are few seniors available to ask. She goes home and worries about the decisions she has made, concerned that a patient will come to harm.

There are also constant requests to cover rota gaps, which she often helps with as she

wants patients to be well cared for. This means that she finds herself “always at work”. She worries about the negative impact that this is having on her relationship: when she spends time with her partner, she is exhausted and “not good company”. They were thinking about buying a house together, but these plans have been put on hold because of the demands of her job.

This example demonstrates the complexity of ‘struggling’ learners aptly: Sally’s problems have come to light through a professionalism lapse, but she is clearly having academic, personal and potentially mental health problems. Importantly, she has not always been a ‘struggling’ trainee; circumstances have conspired to shift the balance of the scales from ‘coping’ to ‘not coping’. Taking a ‘diagnosis of deficits’ approach, one could easily generate a problem list and strategies for addressing these as presented in [Table 47.1](#)

Table 47.1 An illustration of the ‘diagnosis of deficits’ approach to Sally’s case

| Problem | Next step(s) |
|---|---|
| Professionalism lapse | <ul style="list-style-type: none">– Reflective writing exercise to demonstrate importance of relationships with colleagues– Refer for stress management training |
| Examination failure | <ul style="list-style-type: none">– Educational psychology assessment to exclude specific learning difficulty– Refer for study skills support |
| Insufficient time to study | <ul style="list-style-type: none">– Refer for time management and organizational skills support– Recommend that Sally takes on fewer additional on-call shifts |
| Possible underlying mental health problem | <ul style="list-style-type: none">– Refer for mental health assessment– Recommend counselling or other psychologic therapy |

Although the perceived ‘deficits’ listed in [Table 47.1](#) may all be contributing to Sally’s difficult situation, this approach clearly misses some important contextual factors. This diagnosis fails to acknowledge the contribution of the resource-poor clinical environment and instead makes Sally personally responsible for her ‘deficits’. Looking at the nuance of Sally’s situation, it is clear that focusing on her as an individual can, at best, only ever be part of the solution: educators must be alert to the system problems that ‘struggling’ learners might highlight.

Additional support as an identity challenge



"In order to understand and support 'struggling' learners in a way that is truly holistic, it is vital that their difficulties are not dissociated from the environment in which they have occurred."

It is also vital for educators to be aware of the impact of the 'diagnosis of deficits' approach on the learner that is 'struggling'. They are likely to already feel that their professional identity is under threat: they do not feel capable of being the doctor they aspire to be. In Sally's case, for example, the examination failure clearly had an impact on her perception of herself as a doctor, labelling herself as a 'failure'. Furthermore, the lack of feedback on her decisions did nothing to quell her lack of confidence in herself as a physician. Adding labels such as 'struggling' and 'deficits' would potential exacerbate Sally's awareness of the discrepancy between where she is and who she would like to be, sometimes referred to as identity dissonance (Costello, 2005). Identity dissonance is associated with increased emotional and cognitive burdens, which could then exacerbate the pressure that the learner is experiencing, as represented in Fig. 47.1. So in Sally's case, the process of addressing her deficits by referring her to multiple professionals may make intensify her feeling of failure and sense of distance from the physician she aspires to be. In addition, this approach lays the 'blame' for Sally's difficulties firmly on her shoulders, largely ignoring her current context. To understand and support 'struggling' learners in a way that is truly holistic, it is vital that their difficulties are not dissociated from the environment in which they have occurred.

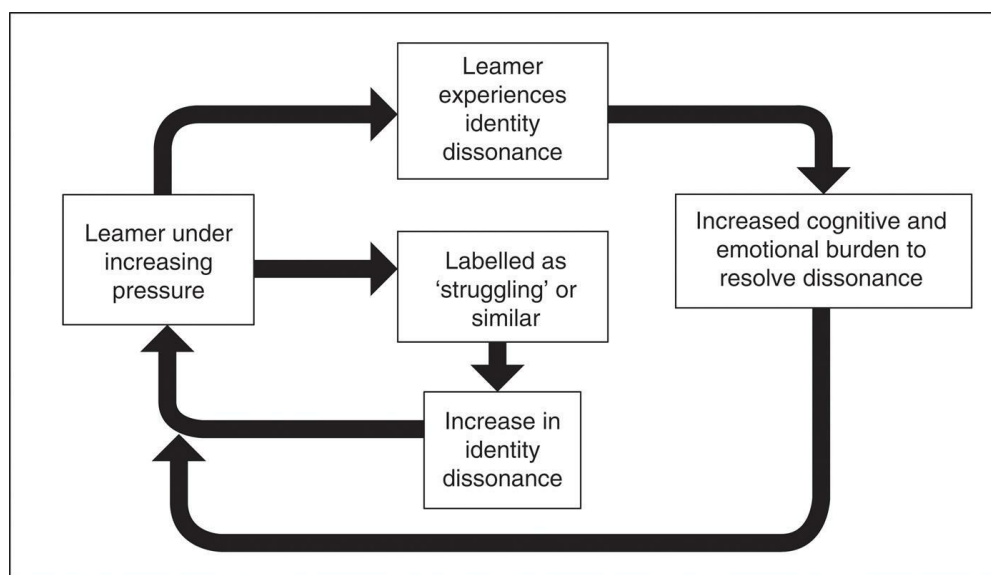


FIG. 47.1 Schematic representing identity dissonances in 'struggling' learners.

System issues



"Trainees are often disproportionately affected by system pressures as not only is their clinical work increasingly challenging but time for training and supervision is also eroded."

While assessing the source of difficulties trainees are facing, we need to remember that in majority of cases the problems lie with the system rather than the individual. As discussed earlier, healthcare has changed rapidly over the past decades. Trainees are often disproportionately affected by system pressures as not only is their clinical work increasingly challenging but time for training and supervision is also eroded. Thus before assuming that the trainee is 'struggling', educators must actually look at problems in the system that have led to this.

The causes of distress in the current generation of doctors in training can be boiled down to a number of key systems factors: the need and expectation to do more with fewer resources; increasing administrative burden; unrealistic expectations from the public; changing on-call patterns that do not align with traditional peer or senior support; loss of continuity of training; lack of time with patients; loss of communal amenities like on-call rooms and doctors' messes; and the industrialization of healthcare that has created a 'transaction' or 'production line' culture ([Gerada et al., 2018](#)). Furthermore, some of these factors may lead to later identification of a trainee that is 'struggling'. In particular, there is a lack of consistency of membership of clinical teams, both because of changing on-call rotas and frequent trainee rotations. This makes out-of-character behaviour or performance very difficult to identify as peers and clinical educators do not have the opportunity to build meaningful relationships.

In addition, postgraduate trainees are usually younger adults, expected by society to build relationships, have children, buy houses and other responsibilities that symbolize a transition into adulthood. There is a continued, although often unspoken, assumption that trainees must work far beyond their contracted hours and that a refusal to do this represents a lack of commitment to the profession. These expectations may have been realistic in the 1950s, when medicine was dominated by men with wives that assumed responsibility for the home environment ([Shirley & Padgett, 2006](#)). Increasingly, however, both men and women are expected to balance work and home life. Thus it is normal for these young people to have priorities outside of work and it should not be a surprise that these competing commitments can mean that trainees are not able to meet the increasing demands of the clinical environment. With these factors in mind, it is hardly surprising that levels of burnout amongst trainees are extremely high and seemingly increasing ([Johnson et al., 2018](#)).

A metaanalysis assessing ways to improve physicians' wellbeing and burnout has shown that organization- or system-based interventions are more beneficial than those focused on individual trainees ([Panagioti et al., 2017](#)). This demonstrates once again that

the bulk of problems with trainee wellbeing lie within healthcare systems, not individual trainees. We see this clearly in Sally's case, where a time management course may be 'prescribed' for her perceived lack of organizational skills but this fails to address the gaps in the rota that place an unreasonable pressure on her time.

Sally's case highlights a key point about system problems, in that it is often easier to find an individual responsible for their 'struggles' and plan interventions targeted at that individual. Simply put, unless someone breaks under pressure, the problems are easily ignored and thus when an individual does 'struggle', they are seen as the exception. If we would have a closer look at other trainees in the same environment as Sally, we would probably see them struggling to a greater or lesser extent as well. It is only that Sally's behaviour has triggered a complaint that her difficulties have been identified. Thus support should equally be available for all trainees and built into their training programme as it is very likely they will need these at some point of their training.

Systems-level support

Training programmes must include ways of assessing and dealing with systems-level problems. As mentioned earlier, organizational strategies are more effective at improving physician wellbeing and burnout than those targeted at individuals (Panagioti et al., 2017). Examples of organizational strategies that have been shown to be effective are presented in Box 47.2 (Olson et al., 2019).

Box 47.2

Examples of organizational strategies to improve physician wellbeing

Culture of wellness

- Leadership development to value trainee wellbeing
- Offering trainees control and autonomy over one's own job plan
- Developing consistent teams and teamwork
- Building collegiality and community
- Formal and informal appreciation (giving and receiving)
- Improving equity, diversity and inclusion

Efficiency of practice

- Developing effective electronic health records (improving usability; simplification; providing adequate time)
- Improving systems for workplace efficiency (engaging users in redesign; improving structures and services)

Personal resilience

Supporting healthy lifestyle behaviours (role-modelling healthy habits; reducing after-hours work; coaching and support readily available)

Peer support (proactive peer support programmes, accessible mental health services)

From Olson et al., 2019.

It is vital that educators acknowledge that healthcare systems are their problem. Often the individuals involved in both designing curricula and frontline educational delivery are distanced from decisions about hospital organization and management. Furthermore, managers are rarely motivated to improve wellbeing as they are driven by patient outcome metrics and are unaware of the impact of burnout on patient care (Panagioti et al., 2018). This can make the process of engaging stakeholders with responsibility for organizational structures and cultures challenging for educators; however, this is a key step in meaningfully supporting students and trainees in clinical environments.

It is also important to see where the systems struggle to meet the needs of medical students. Early-years medical students often have academic and pastoral support systems provided both by their university and their medical school, giving options for students to access support in a variety of ways. These systems usually include peer, near-peer, faculty and professional support, depending on the requirements of the student in question. When students start their clinical rotations, however, they tend to work between healthcare institutions and universities. This can make finding appropriate support that meet their needs more difficult as they may encounter a gap in the system: the problems that arise in one place are not always understood in the other. Thus it is crucial that students undertaking clinical rotations in hospitals or other health centres are immediately and directly linked to support systems where they are. This is of particular importance as transition between clinical environments and stages of training may be especially challenging times (Bullock et al., 2013). Furthermore, robust support structures that persist across the continuum of medical training may reduce the stress associated with career transitions, thus improving wellbeing at all stages of training.



"Support needs to be offered not only to trainees that are already facing difficulties but to all"

Solutions to these problems are never easy fixes, rather these need an overview of the system and involvement of the key stakeholders. Clearly support needs to be offered not only to trainees that are already facing difficulties but to all, in an attempt to prevent distress and 'struggles'. As explained earlier, the medical workforce is facing problems from every angle and trainees are constantly under pressure. Thus there

needs to be a multitier support system built into all training programmes that does not only help reactively, but also proactively prevents trainees getting overwhelmed or burnt out. That is not to say that individual support should not be offered when a crisis point is reached. To do this, we suggest using a formulation approach common in clinical psychology and psychotherapy ([Johnstone & Dallos, 2014](#)).

A formulation approach to understanding ‘struggling’ learners

The purpose of a formulation is to develop a working understanding of the factors contributing to and maintaining an individual’s difficulties, including understanding the connections between problems ([Tarrier & Johnson, 2016](#)). Instead of a list of ‘deficits’, resulting in the piecemeal strategy to address them presented in [Table 47.1](#), a formulation approach allows educators to see the learner as a whole and incorporate contextual factors. In taking this approach, we are not suggesting that all learners that encounter problems are unwell: quite the reverse. Psychologists tend to avoid diagnostic labels, using the process of formulation to describe the difficulties with which a client is currently struggling ([Kinderman & Tai, 2007](#)).

Importantly, a formulation is developed in collaboration with the individual. Being involved in this process may give learners important insights into their perceived ‘failings’, demonstrating the multifactorial nature of their difficulties and highlighting some positive attributes. In Sally’s case, for example, her sense of responsibility for patients that leads her to take on additional shifts is to be commended. In the process of formulation, Sally would hopefully recognize, however, that her own wellbeing should also be prioritized.

There are many ways in which a formulation can be presented. One of the common approaches is to present a diagram with an associated narrative describing the difficulties and the circumstances and thought processes that are maintaining these. A diagrammatic representation of one possible, simplified formulation in Sally’s case is presented in [Fig. 47.2](#). The professionalism lapse that brought Sally to your attention deliberately sits on the periphery as, although this was the trigger for her referral, it actually seems to be of little relevance when all other factors are considered.

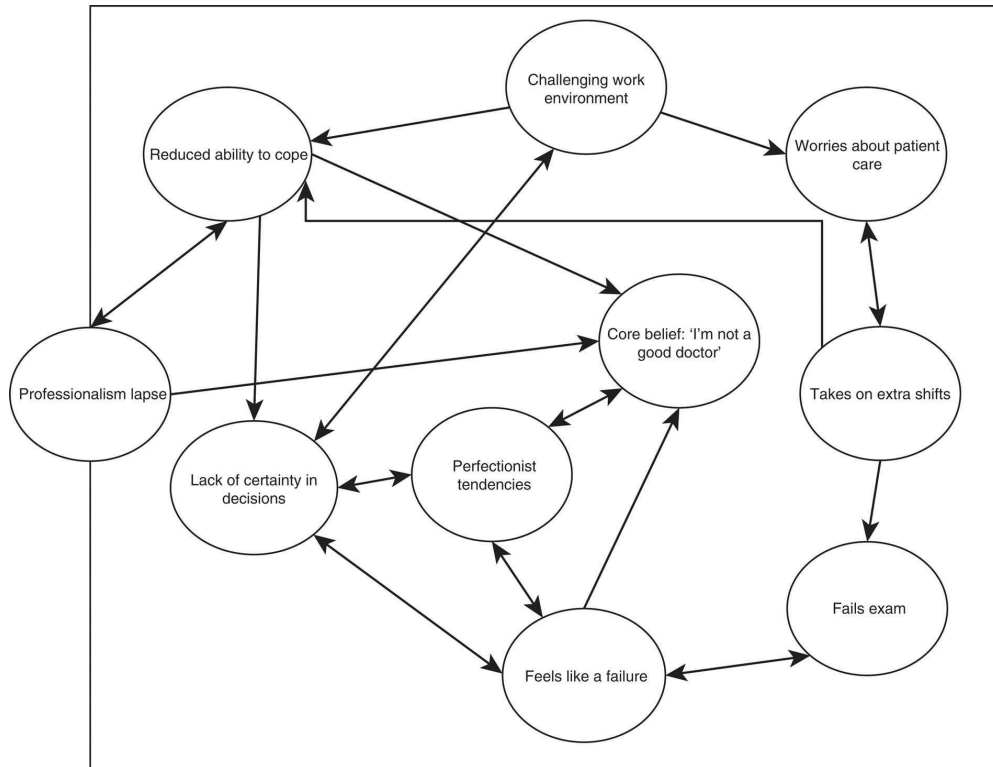


FIG. 47.2 Diagram demonstrating 'formulation' approach to Sally's case.

Having formulated Sally's case in this way, not only is the complexity of the situation evident but so is the interplay between her circumstances and challenging work context. Once learners can be understood in this way, there is space for looking at addressing both individual and contextual factors to provide effective support.

In this case, individual support might be effectively provided via a coaching relationship that allows Sally to reassess her clinical competence and offer positive feedback on her practice, as well as support to achieve her goals and thus reduce identity dissonance. Furthermore, there may be a role for a therapeutic relationship here in order for Sally to explore her self-perception as a failure and give her the tools to prevent such a crisis from occurring in future.

From an organizational perspective, it would be helpful to stop sending requests for rota cover to Sally in an acknowledgement that she is already working at capacity and cannot undertake additional hours. In addition, the senior medical team may need training and support in ensuring that trainees receive timely feedback on their clinical decision-making to provide Sally and her colleagues with the reassurance that patients are being well cared for. A review may also be required of senior doctor working patterns to make contemporaneous feedback possible. Importantly, any interventions must be agreed with Sally to ensure they are truly supportive and not seen as a 'tick-box' exercise that does not meet her needs.

Summary

In this chapter, we have outlined a number of reasons for the increasing levels of stress and burnout in medical trainees. The clinical environment is complex and challenging and systems are failing to create a learning environment in which trainees can thrive. To meaningfully address the issues the learners face, educators must look first and foremost at organization- and systems-level issues to prevent problems. Given the weight of the current evidence, it is no longer sufficient to wait for a trainee to reach a crisis point before putting support in place. Support must be endemic in training environments and must follow a learner through from the beginning of medical school to the completion of training and arguably beyond.

When trainees do 'struggle', it is important to address this in a way that does not create further difficulties. There is a risk that 'struggling' trainees are managed in a way that creates identity challenges and doubts about their abilities. To support individuals, we must take a holistic view that includes contextual factors and accounts for the complex interplay between factors that leads to a trainee reaching a point of crisis. Using a case formulation approach can help to map out these factors and see novel ways of addressing them in collaboration with the individual.

References

- Bullock et al., 2013 Bullock A, Fox F, Barnes R, et al. Transitions in medicine: trainee doctor stress and support mechanisms. *Journal of Workplace Learning*. 2013;25(6):368–382.
- Chew-Graham et al., 2003 Chew-Graham C, Rogers A, Yassin N. “I wouldn’t want it on my CV or their records”: medical students’ experiences of help-seeking for mental health problems. *Medical Education*. 2003;37(10):873–880.
- Costello, 2005 Costello CY. *Professional Identity Crisis* 1st ed. Nashville: Vanderbilt University Press; 2005.
- Gerada et al., 2018 Gerada C, Chatfield C, Rimmer A, Godlee F. Making doctors better. *British Medical Journal*. 2018;363:k4147.
- Guerrasio et al., 2014 Guerrasio J, Garrity MJ, Aagaard EM. Learner deficits and academic outcomes of medical students, residents, fellows, and attending physicians referred to a remediation program, 2006–2012. *Academic Medicine*. 2014;89(2):352–358.
- Johnson et al., 2018 Johnson J, Bu C, Panagioti M. Tackling burnout in the UK trainee doctors is vital for a sustainable, safe and high quality NHS. *British Medical Journal*. 2018;362:k3705.
- Johnstone and Dallos, 2014 Johnstone L, Dallos R, eds. *Formulation in Psychology and Psychotherapy: Making sense of people’s problems*. 2nd ed Hove, UK: Routledge; 2014.
- Judd and Elliott, 2017 Judd T, Elliott K. Selection and use of online learning resources by first-year medical students: cross-sectional study. *JMIR Medical Education*. 2017;3(2):e17.
- Kalet and Chou, 2014 Kalet A, Chou CL, eds. *Remediation in Medical Education: a mid-course correction*. 1st ed. New York: Springer Verlag; 2014.
- Kalet et al., 2016 Kalet A, Guerrasio J, Chou CL. Twelve tips for developing and maintaining a remediation program in medical education. *Medical Teacher*. 2016;38:1–6.
- Kinderman and Tai, 2007 Kinderman P, Tai S. Empirically grounded clinical interventions: clinical implications of a psychological model of mental disorder. *Behavioural and Cognitive Psychotherapy*. 2007;35(1):1–14.
- Olson et al., 2019 Olson K, Marchalik D, Farley H, et al. Organizational strategies to reduce physician burnout and improve professional

- fulfillment. *Current Problems in Pediatric and Adolescent Health Care*. 2019;49(12):100664.
- [Organization, W.H, 2018](#) Organization, W. H. *The 2018 update Geneva: Global Health Workforce Statistics*; 2018.
- [Organization, W.H, 2019](#) Organization, W. H. (2019). *World Health Statistics*. Geneva.
- [Panagioti et al., 2018](#) Panagioti M, Geraghty K, Johnson J, et al. Association between physician burnout and patient safety, professionalism, and patient satisfaction. *Journal of American Medical Association Internal Medicine*. 2018;178(10):1317.
- Panagioti et al., 2017 Panagioti M, Panagopoulou E, Bower P, et al. Controlled interventions to reduce burnout in physicians a systematic review and meta-analysis. *Journal of American Medical Association Internal Medicine*. 2017;177(2):195–205.
- [Shanafelt et al., 2015](#) Shanafelt TD, Gorringer G, Menaker R, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clinic Proceedings*. 2015;90(4):432–440.
- [Shirley and Padgett, 2006](#) Shirley, J. L., & Padgett, S. M. (2006). An analysis of the discourse of professionalism. In D. Wear & J. M. Aultman (Eds.), *Professionalism in medicine: critical perspectives* (1st ed., pp. 25–42). New York, USA.
- [Tarrier and Johnson, 2016](#) Tarrier N, Johnson J. *Case formulation in cognitive behavioural therapy* 2nd ed Hove, UK: Routledge; 2016.
- [Wynter et al., 2019](#) Wynter L, Burgess A, Kalman E, Heron JE, Bleasel J. Medical students: what educational resources are they using?. *BMC Medical Education*. 2019;19.

Student Engagement in the Educational Programme

Marko Zdravkovic and Jim Determeijer

Trends

- Medical schools increasingly invest in student engagement initiatives which promote the development of the students and benefit the institutions.
- The ASPIRE to excellence criteria (which promote the pursuit of outstanding performance in student engagement) are freely available and can be used for internal assessment of student engagement at your institution.
- This chapter presents five key steps to enhancing student engagement at your institution.

Key concepts

- Enhancing students and institutions: improvement of student engagement benefits the development of both students and their institutions.
- Equal partnerships: students and faculty need equal responsibility and ownership for student engagement to succeed and for each to contribute their unique expertise to the university.
- Continuous and stepwise improvement: improving student engagement is a continuous and repeating process which we divided into distinct steps to create overview and structure.

Introduction

Student engagement (SE) has received growing interest over the past decades. The term encompasses a variety of activities, ranging from student participation in the curriculum to student involvement in governance. One of the more comprehensive definitions of SE has been developed by Trowler.



“Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimize the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution.”

Trowler (2010)

Benefits of student engagement

Through active participation, SE enhances learning and professional development of the students. It has been shown that more active students, either in educational, extracurricular or research activities, are more academically successful ([Fredricks, 2011](#)), both in terms of achieving better grades and next year advancement rates ([Fredricks et al., 2004](#)). Through various engagement opportunities, students are able to more easily form their social networks which provide support and nurture the sense of 'belonging' to their educational environment. Specifically, this results in lower dropout rates and promotes better diversity as students from underrepresented backgrounds are at the highest risk of leaving their studies ([Fredricks et al., 2004](#)). Moreover, SE provides the opportunity to individually tailor student experience leading to improved participation which strengthens the sense of 'belonging' and the feeling of ownership over their educational journey. Such student participation also benefits the institutions by improving their curriculum ([Zdravkovic et al., 2018](#)) as well as reputation ([Coates, 2006](#); [Kuh & Hu, 2001](#); [Zepke, 2014](#)).



Tip

It has been shown that more active students, either in educational, extracurricular or research activities, are more academically successful, both in terms of achieving better grades and next year advancement rates.

Theoretical framework of student engagement

Historically, research on SE has focused on cognitive aspects (e.g., investment in deep learning), emotional aspects (e.g., positive and negative reactions to schools and teachers) or behavioural aspects (e.g., positive conduct, participation, attendance). However, exploring each of these elements individually provides a very limited snapshot of the complex nature of SE. Kahu, however, has suggested a compelling conceptual framework for SE which combines all the perspectives listed earlier and adds sociocultural background factors (Kahu, 2013; Kahu & Nelson, 2018). What is more, Kahu has added directionality to SE and has thus separated antecedents to SE, the engagement moment and the consequences of SE (Fig. 48.1). This conceptual framework is useful for understanding SE, directing interventions and designing research.

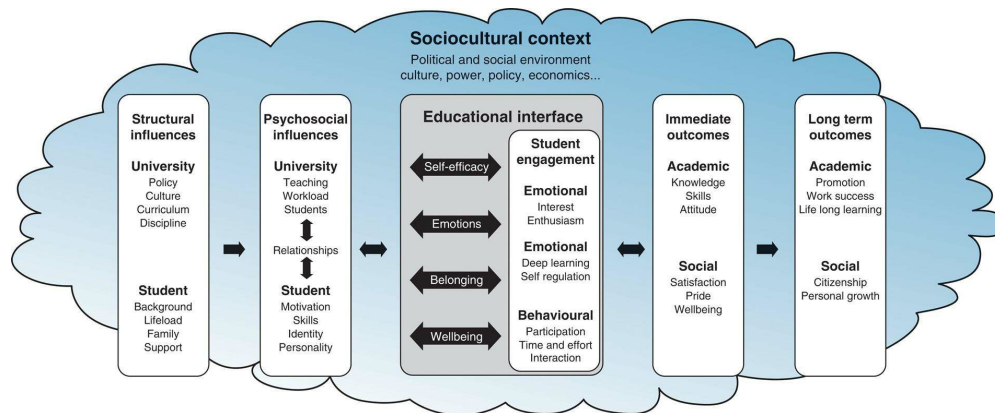


FIG. 48.1 Kahu's theoretical framework for student engagement. (From Kahu & Nelson, 2018. With permission.)

Student engagement in the curriculum

Although it is essential to understand the theory behind SE before dissecting it and deciding on how to enhance it, the practical examples are far more informative. Later, three examples are described to illustrate what successful SE looks like in practice and to envision what the processes, interim goals and supporting structures for enhancing SE might be. More in-depth descriptions of these SE initiatives can be found in the referenced papers.

The first example comes from the University of Maribor in Maribor, Slovenia ([Zdravkovic et al., 2018](#)). The school was founded in 2003 and enrolls a small cohort of students who engage in a popular peer teaching system which was initiated by the students and supported by the dean. It started as noncompulsory small group meetings with senior students as peer tutors focusing on general guidance, core medical topics reinforcement and examination preparations. With the peer teaching experience and established infrastructure, the initiative expanded and led to the introduction of a new elective course. After 2 years of running the elective, its core elements were included in the obligatory curriculum—delivered and organized by peer tutors.

This example illustrates how informal initiatives can lead to formal curricular changes with a sustainable and positive change. One of the key elements for such SE development is equal partnership between students and faculty. This was enabled in Maribor through the Centre for Medical Education which was equally run by students and faculty. This platform serves as an incubator for education innovation through equal partnership, room for open discussion, mentorship and financial project support.



Tip

Informal initiatives can lead to formal curricular changes with a sustainable and positive change.

The second example is that of the Charité in Berlin, Germany, illustrating SE development within a larger and older institution ([Milles et al., 2019](#)). The curriculum revision in 2010 formally included medical students into the board of directors of each curricular module. Consequently, each module board consisted of three faculty members and a student who were responsible for cyclic curricular development of their module. The module student directors later self-organized, shared information and provided support for one another. The first-hand experience of the curriculum and a supportive network enabled students to gain expertise in interpreting the place of a module in the learning spiral of the curriculum. Students and faculty responded positively to such collaboration, appreciated its impact on the curriculum and reported seeing the other party as equal. (Note: equal partner does not mean equal expertise as students and faculty bring different strengths to the table.)

Essential for developing the student codirectors is the supportive structure students built among themselves and subsequently the training they delivered to each other. As such, students shifted from a classical reactive to a proactive role with shared responsibility making them formal members of the academic community.

The third example comes from the Vrije Universiteit in Amsterdam, the Netherlands, where pharmacotherapy Learner-Centred Student-Run Clinics were developed ([Schutte, 2018](#)). The project was initiated as an extracurricular activity with the aim to improve the prescribing skills of medical students. First-, third- and fifth-year students, working as a team, performed regular consultations with patients from the internal medicine outpatient clinic with an added focus on the pharmacotherapeutic plan. All consultations were supervised by an internist and deemed safe and providing quality of care. Patients were satisfied with the care provided and voluntarily attended student consultations. Students found the experience highly motivating, emphasized the extensive learning opportunity, and valued the responsibility and teamwork involved. What makes this project unique compared with regular clerkships is that students learned from early patient interaction, were given a high level of responsibility, ran the programme themselves and learned through being coached instead of being taught.

The success of the Learner-Centred Student-Run Clinics demonstrates that students, when given real and authentic responsibilities supported with adequate coaching, supervision and collaboration, can deal with and learn from difficult cases and situations.

These three examples will hopefully provide some practical insight for the reader on how to enhance SE in various settings while keeping in mind that SE itself is an ongoing process rather than a distinct goal.

A stepwise approach for enhancing student engagement

SE, as shown earlier, is multifactorial and cannot be approached as ‘one size fits all’. For institutions eager to develop or improve SE the question of where to start and what to strive for can be daunting and vague. The subsequent five steps have been developed to demystify SE and aid in achieving practical and sizeable results regardless of one’s SE goals, current state of SE or culture.

Step 1: Assess student engagement

Most institutions already have more SE initiatives in place than they are aware of. However, most of these SE initiatives are informal, run by a group of enthusiasts and/or hard to spot if outside their direct network. Establishing a means of identifying, mapping and assessing SE is a valuable starting point for each organization willing to invest in SE. The ASPIRE¹ criteria, described in more detail later, were developed to recognize excellence in SE for medical, dental, veterinary and health sciences institutions. The same ASPIRE criteria, however, can be used as a means of categorizing different SE initiatives into four spheres (SE in governance, education programme, academic community and extracurricular activities) and as a self-assessment tool (Hunt et al., 2018). A so drafted map of SE activities can then be shared within the academic community with a further call to report any other ongoing SE initiatives. After acquiring an overview of existing SE initiatives, an assessment should be made. A strengths, weaknesses, opportunities for improvement and threats for improvement (i.e., the SWOT [strengths, weaknesses, opportunities and threats]) approach can be used to assess the current level of SE within an institution.



Tip

ASPIRE criteria can be used as a means of categorizing different SE initiatives into four spheres (governance, education programme, academic community and extracurricular activities) and as a self-assessment tool.

Step 2: Share a condensed one-page report and set new student engagement targets

SE encompasses many different types of engagement and members of the academic community will likely report a wide range of interpretations of SE. Spreading the SE definition and categorization within the academic community can be beneficial to breed a common understanding of SE and a common goal to strive for. Giving condensed

feedback to the whole community with the new SE targets clearly communicates how much SE is valued and that the leadership supports SE development.

Step 3: Create the supporting system

All interested parties to contribute to SE development will then need an adequate supporting system (Peters et al., 2019). Each institution should consider the ways of making SE project delivery easier and sustainable. Important aspects to be considered are financial support, administrative staff support, space for and opportunities to develop and work on the ideas, allocated time, peer teaching, (peer) training, mentoring and coaching (Peters et al., 2019; Zdravkovic et al., 2018). Special attention should be given to supporting the equal position and voting rights of students and staff in all governance aspects of a medical school, including curriculum design and evaluation, which might require change in official school policies (Peters et al., 2019). An essential aspect is to establish a formal position for SE, such as student and faculty coordinators for SE. These two champions would then be responsible to form a SE support team, be the link between project delivery and the school leadership and connect the existing with the new SE initiatives (Zdravkovic et al., 2018).

Step 4: Improve the existing, engage the unengaged and innovate

In this step, the focus is entirely on expanding, improving and further embedding the ongoing projects and their people, creating entry points for people or projects who want to engage and establishing connections within and between these two groups. It should be emphasized that SE breeds SE (Kahu, 2013; Peters et al., 2019). Establishing a well-connected SE coordination team, consisting of students and faculty, is essential for any successful SE development programme. The SE coordination team can fulfil a central facilitating position for SE initiatives, maintain a network for initiatives and people to connect and take responsibility for continuous improvement of the general SE community. The SE coordination team can also identify new SE opportunities, provided their representative(s) is a part of the schools' official curriculum committee. Furthermore, the SE coordination team provides SE with a face and a voice which makes SE approachable, helps convey a clear message and promotes SE. In addition, all active stakeholders should hold the responsibility for their project delivery and the ownership for their contributions.

Step 5: Return to step 1

All the enacted efforts to enhance SE should be regularly (e.g., annually) reassessed and the findings fed back to the academic community (step 1 and step 2 described earlier). This actually represents a circular progression of the suggested five-step model (Fig. 48.2) and is a form of closed loop communication. For example, ideas for improvements at the school collected from the students can be fed back by the faculty as a live online

progress list with a traffic light colour process. Green would represent the changes already made based on student suggestions, yellow the ones in progress and red the ones currently on hold – with appropriate comments on why this is so. In this circular repetitive process, institutions can regularly revise each of the steps and optimize SE development process.

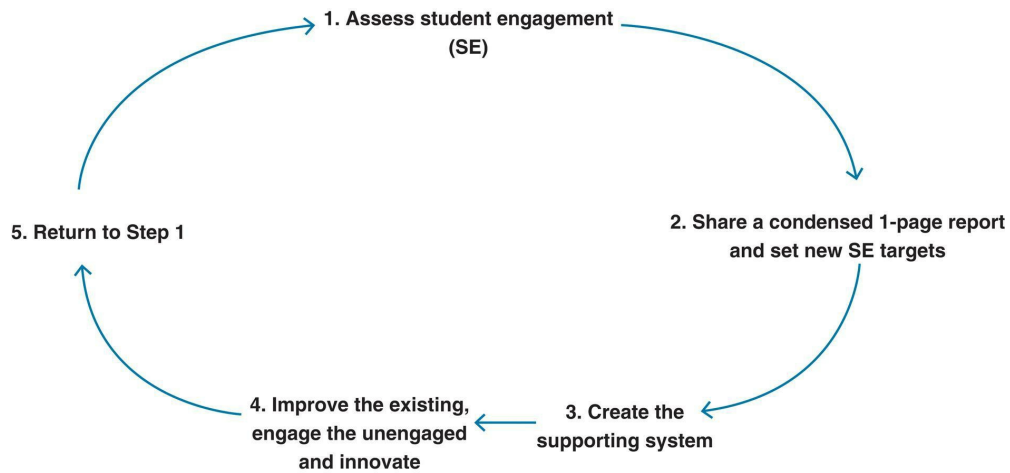


FIG. 48.2 A stepwise approach to enhancing student engagement.

How to avoid major pitfalls?

As with each process, improving SE comes with pitfalls ([Determeijer, 2018](#); [Kahu, 2013](#); [Peters et al., 2019](#)). We would recommend the following key strategies to avoiding major pitfalls: (1) engage faculty just as much as students; (2) set different goals and strategies for a (small) motivated group *versus* a not yet motivated (larger) group of students; (3) formally embed SE in the curriculum but keep creativity and opportunities of informal activities alive; (4) do not force SE initiatives top down; rather start with what already exists and expand. Keep in mind that SE breeds SE ([Kahu, 2013](#); [Peters et al., 2019](#)).

Criteria for student engagement excellence: the ASPIRE programme

The schools with highly developed SE constantly innovate and push the limits of SE. And today there is a means of recognizing such efforts internationally. The ASPIRE project was launched in 2012 to promote the pursuit of excellence in medical education and to somewhat counterbalance the research-based recognitions of institutions (Hunt et al., 2018). One of the educational excellence areas awarded by the ASPIRE project is also SE for which 16 schools have been recognized over the last 7 years. The ASPIRE excellence criteria in SE were developed by the international group of experts and categorize SE into four spheres: SE in governance, education programme, academic community and extracurricular activities. Although we encourage using these criteria for internal evaluation of SE within medical, dental, healthcare and veterinary schools (Step 1 in our five-step model for enhancing SE), some institutions might rather opt for external evaluation and apply for the ASPIRE award in SE. Based on the feedback, the schools can then swiftly use the reviewers' suggestions to improve SE and some will be found of sufficient excellence to merit being awarded the ASPIRE award too. Also, the representatives of the winning schools have joined and collaborate as the members of the ASPIRE Academy, promoting the pursuit of excellence in medical education through publication and conference activities (Klamen et al., 2017). The group can be readily approached for advice through general ASPIRE contact email: aspire@dundee.ac.uk.



Tip

What appear to be the essential requirements to receive the ASPIRE recognition of excellence are: student representation and voting rights in the curriculum committee, evidence of the change resulting from the student voice, using student faculty evaluations for the faculty promotion and retention, using student course evaluations in curricular design and change, and overall support structures for SE.

Summary

SE should be one of the primary concerns of every medical school. Striving towards excellence in SE leads to many benefits for both students and their institutions. This chapter has hopefully equipped the reader with a practical five-step approach to enhancing SE and tips on how to avoid the major pitfalls. Diverse and illustrative examples provided should be read in concert with Kahu's theoretical framework of SE to generate ideas for further enhancing and researching SE.

References

- Coates, 2006 Coates H. The value of student engagement for higher education quality assurance. *Quality in Higher Education*. 2006;11:25.
- Determeijer, 2018 Determeijer, J. (2018). Student engagement at the AMC: Reflection, improvements and best practices from abroad. Internal publication, can be shared on request by contacting the author at: j.j.determeijer@amsterdamumc.nl.
- Fredricks, 2011 Fredricks JA. Engagement in school and out-of-school contexts: a multidimensional view of engagement. *Theory Into Practice*. 2011;50(4):327–335.
- Fredricks et al., 2004 Fredricks JA, Blumenfeld PC, Paris AH. School engagement: potential of the concept, state of the evidence. *Review of Educational Research*. 2004;74(1):59–109.
- Hunt et al., 2018 Hunt D, Klamen D, Harden RM, Ali F. The ASPIRE-to-Excellence Program: a global effort to improve the quality of medical education. *Academic Medicine*. 2018;93(8):1117–1119.
- Kahu, 2013 Kahu ER. Framing student engagement in higher education. *Studies in Higher Education*. 2013;38(5):758–773.
- Kahu and Nelson, 2018 Kahu ER, Nelson K. Student engagement in the educational interface: understanding the mechanisms of student success. *Higher Education Research and Development*. 2018;37(1):58–71.
- Klamen et al., 2017 Klamen DL, Greer P, O'Sullivan P, et al. *Push your performance toward excellence: let the ASPIRE Academy help!*. Abstract book Helsinki: An international association for medical education (AMEE); 2017;630 Available online (page 630): <https://amee.org/getattachment/Conferences/AMEE-Past-Conferences/AMEE-2017/AMEE-2017-Abstract-Book.pdf>.
- Kuh and Hu, 2001 Kuh GD, Hu S. The effect of student-faculty interaction in the 1990s. *Review of Higher Education*. 2001;24:309–332.
- Milles et al., 2019 Milles LS, Hitzblech T, Drees S, Wurl W, Arends P, Peters H. Student engagement in medical education: A mixed-method study on medical students as module co-directors in curriculum development. *Medical Teacher*. 2019;41(10):1143–1150.
- Peters et al., 2019 Peters H, Zdravkovic M, Costa MJ, et al. Twelve tips for enhancing student engagement. *Medical Teacher*. 2019;41(6):632–637.
- Schutte, 2018 Schutte, T. (2018). Learning in a student-run clinic: a new concept to improve medical education in pharmacotherapy.

Accessed at <https://research.vu.nl/en/publications/learning-in-a-student-run-clinic-a-new-concept-to-improve-medical>.

Trowler, 2010 Trowler V. Student engagement literature review. *Higher Education Academy*. 2010;11:1–15.

Zdravkovic et al., 2018 Zdravkovic M, Serdinsek T, Sobocan M, Bevc S, Hojs R, Krajnc I. Students as partners: our experience of setting up and working in a student engagement friendly framework. *Medical Teacher*. 2018;40(6):589–594.

Zepke, 2014 Zepke N. Student engagement research in higher education: questioning an academic orthodoxy. *Teaching in Higher Education*. 2014;19(6):697–708.

¹ASPIRE is an international programme established to recognise excellence in medical, dental and veterinary schools (<https://www.aspire-to-excellence.org>).

Professional Identity and Career Choice

Roger Ellis and Elaine Hogard

Trends

- Professional identity (PI) poses problems of definition and meaning; measurement and assessment; and teaching and learning (Ellis & Hogard, 2020). It depends crucially on the values held by the professional. The idea of professional identity has implications for the whole medical curriculum but in this chapter, we are looking particularly at selection and careers choice and guidance.

Key concepts

- Professional identity (PI): of central importance in medical education but open to many definitions and difficult to measure and assess, teach and learn. It includes self-concept, knowledge, skills and centrally, values.
- Values: principles or standards of behaviour. They are not directly observable but are inferred from behaviour.
- Selection: the process of determining which applicants should be offered a place on a programme. It should be fair, transparent and defensible.
- Value-based recruitment (VBR): an approach which attracts and recruits' students on the basis that their individual values and behaviours align with those that the programme is aiming to develop. Careers guidance: helps students to make informed choices of career including medical or health specialism, and related activities in teaching, research and administration.

Introduction

The main focus of this chapter is on professional identity in medicine. PI poses problems of definition and meaning; measurement and assessment; and teaching and learning ([Ellis & Hogard, 2020](#)). It depends crucially on the values held by the professional. The idea of PI has implications for the whole medical curriculum but in this chapter, we are looking particularly at selection and careers choice and guidance. This chapter will be dealing with:

- PI
- Values
- Selection
- Value-based recruitment
- Medi match
- Careers choice and guidance

Professional identity

The terms profession, professional, professional identity and professionalism are referred to numerous times in Medicine, and often used interchangeably (Lane, 2020a; 2020b). This can lead to confusion as to what the concepts really mean. Clarity is needed when we quote them, and, more importantly, when we apply them to professional practice and training.

PI has both internal and external aspects. On the one hand it is the way the individual sees themselves; on the other hand, it is the way they are seen. A comprehensive view of PI includes all the knowledge that a doctor is expected to have and all the things they are able to do to help patients. The medical curriculum reflects this with components dedicated to knowledge and competence. However, underpinning what is done and what is known is a set of values which determine ethical standards for practice. Developing a PI, including the right values, is both fundamental to the curriculum but also the most challenging for teaching, learning and assessment. We will be looking at values for medical practice and their implications for the selection of students and for careers guidance and selection.

Both PI and values are slippery concepts. Neither are directly observable but have to be inferred from observable behaviour. Rather than being objective entities that can be recorded and quantified they are hypothetical constructs open to different interpretations. Notwithstanding these problems, we will aim in this chapter to offer some practical advice and suggestions.



"Both professional identity and values are slippery concepts."

As an example, take the key professional activity of diagnosis. Clearly a sound diagnosis depends on accurate observation and a knowledge base to which this can be related. The observations must produce valid and reliable data and these data must be processed through an accessible knowledge base to determine appropriate action. All of this depends on competencies and learning which can be taught and assessed. But the approach to the diagnosis depends on values that are not in themselves directly observable. Such a value would be respect for persons. Respect would be inferred from the interactional style of the diagnosis and the physician's sensitivity's possible effects on the patient. Such a value is more difficult to teach, complicated to learn and challenging in assessment.

We would argue that it is these values that are the fundamental characteristics of professional identity. The values held by applicants should therefore be a consideration in selection and this has led to so called value-based recruitment (VBR). We will be describing an innovative approach to VBR.

At the end of the training programme students must select a career direction which matches their view of their PI as it is and as it might develop. We will consider ways in which this might be addressed in the programme, including an innovative approach

called Match.

PI is a hypothetical construct that can be theorized in a number of ways and operationalized accordingly. The following are two examples.

Typically, theories of PI borrow from established identity theories which stress the development of identity through stages. [Cruess et al. \(2015\)](#) building on Kegan suggest that PI moves from an initial superficial adoption of the professional role through increasing integration and adoption of key values, and accommodation to identity conflicts, to ideally, a deep, authentic and unshakable incorporation of PI with other enduring identities defining the self.

Another approach is to propose a typology of PI suggesting that it can take different forms. [Coulehan and Williams \(2003\)](#) distinguishes three types of PI in medicine, two of which are relatively dysfunctional. First, there is technical identity where the doctor abandons traditional values, becoming cynical about duty and integrity and narrowing the sphere of responsibility to the technical arena. Second is nonreflective identity where the doctor espouses and consciously adheres to traditional medical values whilst subconsciously basing behaviour, or some of it on opposing values, thus being self-deluded and detached. Third is compassionate and responsive identity – the doctor overcomes conflicts between tacit and explicit socialization, internalizes the virtues and values professed and manifests these in behaviour.

Although it might seem obvious that a programme of medical education should play a key role in the development of an appropriate PI, there is no agreement as to how this might be best achieved. Whereas the professional role includes competencies and knowledge and the teaching, learning and assessment of these are relatively well understood, their integration into an individual identity is more problematic.

It is beyond the scope of this chapter to review theories of professional development; however, the characteristics of the two examples given suggest three tests which can be applied to any formulation. First is it coherent in its own terms and theoretically consistent and meaningful? Second does it have an evidential base with hypotheses derived from it and subject to empirical verification. Third does it have practical implications for medical education?



Tip

- Articulate your programme's idea of professional identity.
- Identify where and how this is taught and learned in the programme.
- Identify where and how it is assessed.

Values

Values are fundamental beliefs that determine behaviour in a range of situations. Values have an ethical dimension and are sometimes referred to as medical ethics. They are assumed to have a degree of permanence. Values themselves are hypothetical constructs and are not directly observable but have to be inferred from consistencies in observable behaviour. When a value points clearly to a set of behaviours or at least a behavioural disposition they may be called attributes. Although they are considered important in courses of professional training, they pose problems for teaching, learning and assessment.

The professional curriculum may be considered as having three main components: knowledge, competencies and values. Knowledge includes both medical sciences and related biological and behavioural sciences. Competencies include both clinical and social skills. Both components are covered elsewhere in this book.

It is beyond the scope of this chapter to consider approaches to the teaching and learning of professional values. Instead we will focus on two situations where values and their assessment are important. The first is selection; the second is careers guidance.

Examples of values deemed important in medicine range from attempts to describe a small number of fundamental values to longer lists which aim to be comprehensive at a more detailed level.



"The professional curriculum may be considered as having three main components knowledge; competencies and values."

Four basic principles to guide the professional approach to patients and their care are autonomy, justice, beneficence and avoidance of maleficence. Each of these principles can of course be broken down into more specific values. As the analysis becomes more detailed and fine-grained, values get closer to specific behaviours and shade into competencies. For example, autonomy for the patient requires informed consent and decision making; and freedom from coercion. Informed consent requires knowledge of procedures and risks and effective communication. Freedom from coercion requires respect for persons and sensitivity to feelings.

As an example of a longer list of values, the UK Medical Schools Council Assessment Alliance has produced a list of core values and attributes needed to study medicine ([MSC Selection Alliance, 2018](#)). The distinction between value and attributes is an interesting one in that values are beliefs which may not lead to action whereas attributes are behavioural dispositions reflecting values. Attributes should be manifest in assessable behaviour.

The list includes

- Motivation to study medicine and genuine interest in the medical profession
- Insight into your own strengths and weaknesses

- The ability to reflect on your own work
- Personal organization
- Academic ability
- Problem solving
- Dealing with uncertainty
- Manage risk and deal effectively with problem statements on the core values and attributes needed to study medicine
- Ability to take responsibility for your own actions
- Conscientiousness
- Insight into your own health
- Effective communication, including reading, writing, listening and speaking
- Teamwork
- Ability to treat people with respect
- Resilience and the ability to deal with difficult situations
- Empathy and the ability to care for others
- Honesty

Producing a convincing list of values and attributes is one thing; determining the evidence which will give valid and reliable evidence of their existence is another. The aforementioned list was produced to inform the application process for medicine which raises the question of how data might be gathered for selection.



Tip

- Identify the values and attributes which characterize your model of professional identity
- Describe how these are taught and assessed in your programme.

Selection

Selection is the culmination of the application process when decisions are made as to who should be admitted to a programme. Selection should be based on valid and reliable evidence about a candidate. This evidence is evaluated against standards and in comparison, with other candidates in the context of the number of places available. This process should be transparent, fair and defensible.



“Assessing the values held by applicants and their potential for developing the values central to a professional identity is particularly difficult.”

Selection should be predictive of success on the programme and ultimately as a medical practitioner. Medical programmes consist of academic and practical learning components together with the development of a PI and its values.

Selection for the academic component is the most straightforward because it can be based on national examination results and also on dedicated tests for prospective medical students. Using these results for selection meets the requirement for transparency, fairness and defensibility.

Gauging potential for practical learning and professional development is more problematic. The applicant may be required to produce evidence of relevant practical activities.

Evidence may be drawn from a wide range of experiences including:

- Work experience placements
- Experience of paid employment
- Volunteer work
- Participation in social activities
- Educational experience

However, the availability, acceptability and evaluation of this evidence is relatively unreliable and dubious valid.

Practical assessments may be built into selection through simulations or even preliminary Objective Structured Clinical Examinations. Use is also made of multiple mini-interviews (MMIs) where each interview requires a practical response. Face-to-face interviews may include an assessment of communication skills.

Assessing the values held by applicants and their potential for developing the values central to a PI is particularly difficult. This approach to selection is called VBR ([Pearson & Latham, 2016](#)). VBR is an approach which attracts and selects students, trainees or employees on the basis that their individual values and behaviours align with the values of the selecting organization.

Medical values are of course not directly observable but have to be inferred from behaviour in the professional role. Clearly this is not feasible for applicants. Methods

which are used to assess values before selection include

- Structured interviews
- MMIs
- Selection centres
- Situational judgement tests (for screening)

Scoring these activities depends on valid and reliable inference from behaviour by trained observers. The candidate's response to questions or in a personal statement depend on their ability to reflect on their own values. This self-report evidence is of doubtful validity because it assumes that applicants are able to reflect on their values and that they will report them honestly rather than saying what they believe is required.

A more cost-effective approach may be to require applicants to complete an appropriate psychometric test assuming a suitable one is available.

At the Northern Ontario School of Medicine (NOSM), such a test is being developed and called Medi-Match. Our aim is to build into our selection procedures evidence of the medically related values held by applicants and the extent to which these matches those which an ideal clinician should hold. The test is e-tailored in part to the particular values which would be consistent with the distinctive regional mission of the school.

While recognizing existing methods for value-based selection, including interviews, personal statements and MMIs, a psychometric test that could provide a valid, reliable and feasible indication of the values held by applicants would be a strong contributor in selecting students suited to the school's missions.

In the absence of a test meeting these requirements, a version was created using concepts from an identity theory called identity structure analysis and its associated measurement approach Ipseus ([Passmore et al., 2014](#)). This approach has been used to develop a VBR instrument for nursing programmes and that this had been piloted successfully ([McNeill et al., 2018](#)). This is the basis of the Medi-Match instrument with values relevant to the NOSM.

Ipeus is a proprietary software which facilitates the development of an instrument. Once devised the software enables its presentation to respondents through a web-based platform. The software collects the responses of respondents and analyses them to present a comprehensive report on the respondent's position regarding the values included.

An Ipeus instrument is not a conventional questionnaire. The instrument is made up of bipolar constructs derived from the chosen values which have to be applied to entities. The bipolar constructs represent dimensions of thought representing particular values; the entities represent people and aspects of self. Completing an instrument requires each construct to be applied to each entity. Through these mini-dialogues applying constructs to entities the respondent's value position can be calculated with scores on individual values and an overall score.

Medi-Match is being custom designed and built using the Ipeus software framework and at present requires the application of 20 bipolar constructs representing medical attributes and values to 12 entities from personal, home and work domains. The value

constructs used in the Medi-Match instrument are derived from a literature search, consultation and trials with experienced and well-respected clinicians; moderated by the insights of the expert research team. The following are some examples of constructs in relation to values.

| | |
|------------|---|
| Value: | Commitment to research-based medical knowledge as a basis for practice. |
| Construct: | Believes that practical skills must be based on theory..... |
| | Believes practical skills are based on common sense and experience. |
| Value: | Independence and self-determination. |
| Construct: | Believes a senior person should never be challenged..... |
| | Believes a senior person should be challenged if they are incorrect. |
| Value: | Realistic approach to work. |
| Construct: | Would take shortcuts to achieve a target..... |
| | Would always make sure everything is done thoroughly. |

The entities included are:

- Ideal self
- Self at work
- Self at home
- Me 2 years ago
- Me in 5 years' time
- The person I most dislike
- A model medical practitioner
- A clinical manager
- A typical patient
- A bad medical practitioner
- My best friend
- My parents

A school can select the values that most closely align with that school's mission. In the instrument each construct is presented as a connecting two contrasting points of view. In applying a construct to an entity respondent use a nine-point, semantic differential scale with a centre zero and four points on either side indicating the positive or negative appropriateness of the pole for the entity being appraised. Centre zero is used by the respondent if they cannot decide between polar values.

The entities in the instrument are aspects of self and people from the workplace and home context. Respondents are asked to appraise aspects of self and other people in terms of the attributes or values they perceive them to have or hold. For example, "At work I am prepared to challenge someone more senior if I feel it is in the interests of the patient/would not challenge someone more senior in any circumstances".

A conventional questionnaire would ask direct questions regarding the values held by a respondent. The Medi-Match instrument approaches the values less directly by requiring the respondent to apply each value in a number of dialogues appraising a range of people. From the LogRhythm's in the Ipseus software indications can be given of the respondents preferred value poles and the significance of the value to the

individual.

Although Medi-Match is still in the early stage of development, it is anticipated that like Nurse-Match it will be a useful measure of values which could play a part not only in selection but in charting progress towards a PI and subsequent professional development.



Tip

Identify if Value Based Recruitment is part of your selection procedures.
Identify how data is gathered regarding applicants' values.

Careers choice and guidance

Careers choice is the process whereby medical students make, ideally, a well-informed, realistic decision about their future career. This choice involves, in principle, a matching of the student's emergent PI with that of the specialism they choose. Careers guidance is the process provided by the medical school that enables this decision. Although some form of choice, possibly less than ideal, will happen inevitably, careers guidance appears to vary widely between medical schools. There are a number of issues and problems with the area.



"There is a concern that careers guidance is not sufficiently integrated into the curriculum as a whole and there is an expressed need for national guidelines."

Many medical students are unhappy at the extent and quality of careers advice ([Fuller et al., 2006](#)). The most cited shortcomings were lack of structured career advice ([Kasim et al., 2016](#)).

There is evidence that students find the process very stressful and that the matching of student choice with service needs and opportunities is dysfunctional.

There is a concern that careers guidance is not sufficiently integrated into the curriculum as a whole and there is an expressed need, in Canada at least, for national guidelines ([Howse et al., 2017](#)).

Starting with the present guidelines, it is recognized by programme accreditors that the medical school has an important role in supporting and facilitating career choice. Although the standards set by, for example, China Academy of China Medical Sciences are brief, they do nevertheless require a system for careers guidance and both required and optional career advising activities. By system, it is intended that a school must have an individual in place who coordinates the activities and serves as the point-person that a student can go to if they are unsure which discipline they want. Schools then must also have required sessions that augment the discipline specific special interest group sessions that focus on one career option. The General Medical Council requires that all doctors in training must have an educational supervisor who should provide, through constructive and regular dialogue, feedback on performance and assistance in career progression. The training programme director should also have career management skills (or be able to provide access to them) and be able to provide career advice to doctors in training in their programme.

Guidance is a process of facilitating informed choice and this has both. Informational and psychologic implications. There needs to be information about the student and their PI, including, as described earlier, their knowledge, competencies and values. Ideally for each of the possible careers open to medical students there should be a comprehensive description with which the student's PI can be matched. Matching information in this way can seem as an objective process with clear outcomes. However, the crucial decision of choosing a career with unpredictable outcomes is an emotionally

charged process. There is evidence that in the United States and Canada, at least, it has become very stressful for students to select their discipline. Guidance must be structured and purposeful but also sensitive and supportive. Guidance should include advice to students who seek what are called oversubscribed disciplines (orthopaedic surgery, neurosurgery, emergency room [ER], dermatology, to list a few) to have back up plans to successfully get a residency. Disappointment needs support and motivation for renewed realistic planning.

The idea of matching audits, self and career, is developed by the Association of American Medical Colleges (AAMC) in their Careers in Medicine website (AAMC.org/careersinmedicine). Through the website students can:

- Assess their interests, values, personality, and skills to help you choose specialties that best fit your attributes.
- Learn details, such as salary and lifestyle, prerequisites and length of training, competitiveness data, types of patients and procedures, and other characteristics of more than 120 specialties.
- Compare their qualifications, pinpoint their preferences for residency training and compare programmes.
- Position themselves to be more competitive to land a residency.

Central to this process is the awareness which students need to develop about themselves on the one hand and the options on the other. Developing self-awareness is an important feature of PI (AAMC.org/careersinmedicine) and in this way the early material regarding PI in this chapter links with the process of career choice. The more information students can have about their identity, including perhaps their value orientation through tests like Medi-Match, the more realistic their choice should be.

Matching this realistic self-awareness, students will need information regarding the specialisms they might follow. This information should include an account of the activities that characterize the specialism, including working conditions and locations, patient groups and their needs, interventions challenges and likely success and relative failures. Information should include not only the characteristics of the specialism itself but also the opportunities for employment in areas where students are prepared to work.

Choice is a function of both personal and external factors. For most, this decision is an ongoing process throughout their undergraduate schooling. Although some students know what specialty they want to pursue at the time of entrance, most are influenced by internal and external factors throughout their schooling.

Factors that are reported as influencing medical students' career choices range from personality and personal attributes, through gender differences, to issues of prestige and income. Lifestyle issues and role models are identified as prominent factors influencing medical students. Although all these factors have been demonstrated to have an influence on choice, few studies have addressed career choice on a broad scale integrating factors ([Pianosi et al., 2016](#)).

Clearly, identity and PI will have a bearing on choice but there is little research that follows this line of enquiry. Future research examining students' level of self-assessment

and self-reflection in their decision-making processes and level of certainty about their selected specialty would be useful.

The 'system' advocated by accreditors should include the following components. First there should be designated senior responsibilities, including first a member of the school senior team with careers guidance as part of their portfolio. It is suggested that this person should be at assistant dean level or its equivalent. Second there should be an individual whose principal responsibilities are for careers guidance. This person should be responsible for devising, monitoring and improving a system for the school.

Centrally, there should be a team of faculty staff who provide the teaching required for careers guidance including giving individual support and guidance. Each student should have a named career mentor. Staff will require training for this role.

There is not a wealth of research studies of the effectiveness of career guidance at the teaching and learning level. An example of the kind of study needed is the description and evaluation of tailored career coaching by [Hur et al. \(2015\)](#).

Overall, it seems that careers guidance as part of the undergraduate curriculum is relatively neglected, variable in form and questionably effective. This is borne out by the recommendations of the Canadian Review Group ([Howse et al., 2017](#)). They advocate greater integration of careers guidance into the curriculum. Careers guidance should be treated as other parts of the curriculum with learning objectives, a syllabus, teaching and learning methods and assessment. It should also be subject to the programme evaluation process of continuous improvement. This should be the starting point for curriculum planners reviewing careers guidance.



Tip

- Identify your programme's system of careers guidance and responsibilities for implementing it.
- Express Careers Guidance as a programme element/module/sequence of modules with objectives, syllabus, teaching scheme and assessment.

Summary

Consideration is given to the meaning and theoretical analysis of PI in medicine culminating in the identification of values as a key element. Examples of values are given and their importance for VBR is identified. A novel psychometric approach to VBR called Medi-Match is described. Finally careers choice and guidance within which PI is crucial are considered. Careers guidance is identified as a key area in the curriculum requiring a comprehensive review and development.

References

- AAMC.org/careersinmedicine AAMC.org/careersinmedicine.
- [Coulehan and Williams, 2003](#) Coulehan J, Williams P. Conflicting professional values in medical education. *Cambridge Quarterly of Healthcare Ethics*. 2003;12(01):7–20.
- [Cruess et al., 2015](#) Cruess RL, Cruess S, Boudreau J, Snell D, Steinert LY. A schematic representation of the professional identity formation and socialization of medical students and residents. *Academic Medicine*. 2015;90(6):718–725.
- Ellis and Hogard, 2020 Ellis R, Hogard E. *Professional identity in the caring professions: meaning, measurement and mastery* Routledge 2020.
- [Fuller et al., 2006](#) Fuller R, Reuben K, Belfied P. Careers guidance for medical students and foundation trainees the clinical teacher. *The Clinical Teacher*. 2006;3(4):215–219.
- Howse et al., 2017 Howse K, Harris J, Dalgarno N. Canadian national guidelines and recommendations for integrating career advising into medical school curricula. *Academic Medicine*. 2017;92(11):1543–1548.
- [Hur et al., 2015](#) Hur Y, Cho A, Kim S. How to provide tailored career coaching for medical students. *Korean Journal of Medical Education*. 2015;27(1):45–50.
- [Kasim et al., 2016](#) Kasim SS, McGowan Y, McGee H, Whitford D. Prepared to practice? Perception of career preparation and guidance of recent medical graduates at two campuses of a transnational medical school: a cross-sectional study. *BMC Medical Education*. 2016;16(1):56.
- [Lane, 2020a](#) Lane S. Professional identity in medicine. In: Ellis R, Hogard E, eds. *Professional identity in the caring professions: meaning, measurement and mastery*. Routledge 2020a.
- [Lane, 2020b](#) Lane S. Reflective practice and professional identity. In: Ellis R, Hogard E, eds. *Professional identity in the caring professions: meaning, measurement and mastery*. Routledge 2020b.
- [McNeill et al., 2018](#) McNeill C, Erskine A, Ellis R, Traynor M. Developing nurse match: a selection tool for evoking and scoring an applicant's nursing values and attributes. *Nursing Open*. 2018;6(1):59–71.
- [MSC Selection Alliance, 2018](#) MSC Selection Alliance. *Statement on the core values and attributes needed to study medicine* London: Medical Schools Council; 2018.
- [Passmore et al., 2014](#) Passmore G, Ellis R, Hogard E. *Measuring identity: a*

review of published studies High Wycombe, UK: Buckinghamshire
New University Press; 2014.

[Pearson and Latham, 2016](#) Pearson K, Latham N. *Values based recruitment framework* England: NHS Health Education; 2016.

[Pianoski et al., 2016](#) Pianosi K, Bethune C, Hurley K. Medical student career choice: a qualitative study of fourth-year medical students at Memorial University, Newfoundland. *Canadian Medical Association Journal Open*. 2016;4(2):E147–E152.

SECTION 8

Medical School

OUTLINE

- 50 Curriculum and Teacher Evaluation
- 51 Medical Education Leadership
- 52 The Medical Teacher and Social Accountability
- 53 The Educational Environment
- 54 Medical Education Research
- 55 Diversity, Equality and Individuality

Curriculum and Teacher Evaluation

Machelle Linsenmeyer

Trends

- Curriculum and faculty evaluation are important for continuous quality improvement in medical education.
- Evaluation is a broad term and, thus, the aim/purpose of the evaluation must be clearly defined.
- An evaluation model is described in this chapter, the CAPA-CAR model. However, the best evaluation model will match to the evaluation aim/purpose.
- Faculty evaluations should be focused (e.g., teaching or learning) and developmental.

Key concepts

- **Assessment:** the processes and instruments applied to measure the learner's achievements, normally after they have worked through a learning programme of one sort or another.
- **Continuous quality improvement:** a strength-based process that relies on teamwork to improve processes, services and outcomes.
- **Curriculum:** a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and programme of work.
- **Evaluation:** a systematic method for collecting, analysing, and using information to answer basic questions about your programme. It helps to identify effective and ineffective services, practices, and approaches.
- **Quality:** the ability or degree with which a product, service or phenomenon conforms to some set standards
- **Quality assurance:** a focus on current outcomes, with a retrospective (look-back) view of 'what happened.'

Introduction

The primary objective of this chapter is to discuss the decisions and processes that should be considered when thinking about curriculum or faculty evaluation. The intent is not to offer a comprehensive overview of these evaluation topics or provide a full analysis of the literature surrounding these topics. To begin, it is important to note that evaluation is a broad term that can be used to refer to many types of analysis. In thinking about curriculum evaluation alone, the evaluation process might encompass the entire curriculum, a block of courses, a single course, a session within a course, or an educational activity (including faculty evaluations and assessments). See [Fig. 50.1](#) for illustration.

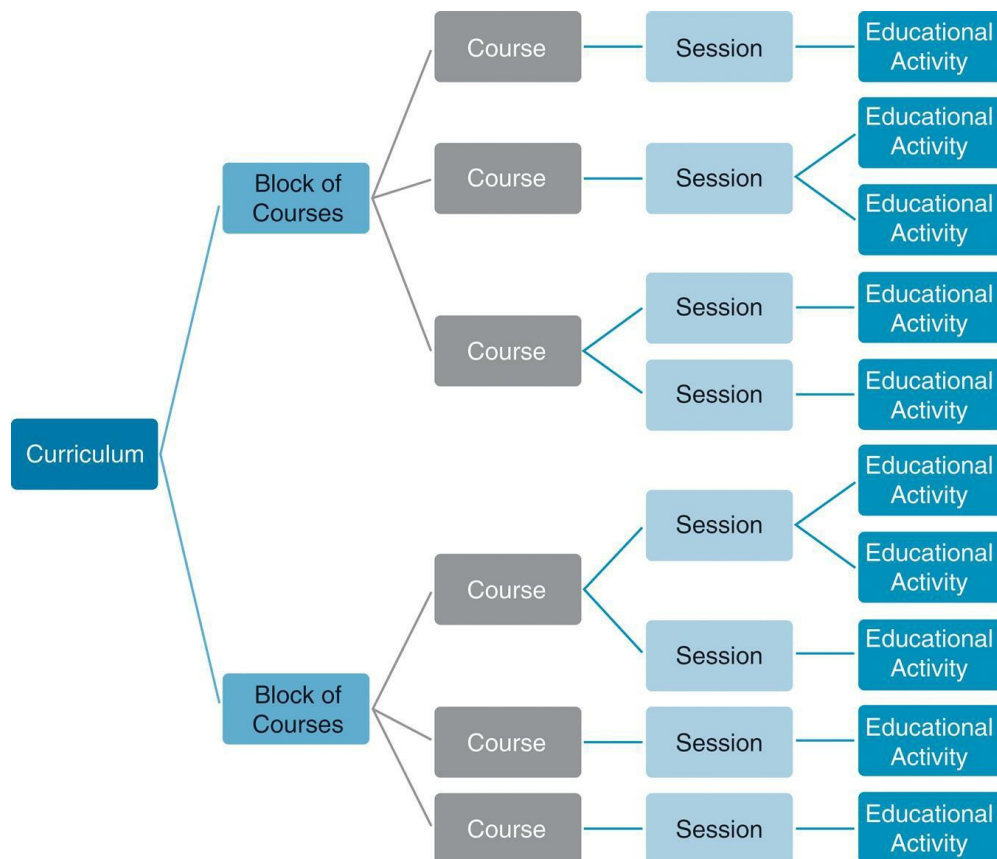


FIG. 50.1 Possible evaluation points for curriculum.

Therefore evaluation processes must be clearly defined and incorporate methods that align to the purpose of the evaluation. It is for this reason that focusing on the decisions and processes that inform evaluation are so important. This chapter will outline why quality evaluation is important, a discussion of evidence-based continuous quality improvement (CQI), a potential model for evaluation, and considerations specific to faculty evaluations.

Why evaluate curriculum and faculty?

Evaluation can help ensure quality. However, defining quality is difficult because quality is subjective and everchanging depending on the context. The key ideas in various published definitions are that quality is the ability or degree with which a product, service or phenomenon conforms to some set standards. In moving from just quality to quality assurance, we then add consistency to the mix. In medical education, quality and quality assurance may be influenced both internally (academic institutions regularly monitoring and reviewing their own policies, practices, and standards) or externally (governments, educational systems, or accrediting bodies reviewing an institution's policies, practices, and standards). Quality assurance has been engrained in most 'external' accreditation standards and *"can be useful in encouraging institutions to conduct self-review and improvement"* (Van Zanten et al., 2008) and *"have profound effects on the nature and delivery of medical education"* (Leinster, 2014) for 'internal' standards. Thus accreditation standards are forcing institutions to consider CQI practices not only in external evaluation but in internal evaluation as well. For example, in the United States, the Liaison Committee on Medical Education's (LCME's) scope and purpose of accreditation states that *"accreditation is a voluntary, peer-reviewed process of quality assurance that determines whether the medical education programme meets established standards"*. It continues to state that the accreditation *"process also fosters institutional and programmatic improvement"* (LCME, 2008)

To meet these emerging demands for quality assurance and CQI, institutions must be thoughtful in the creation of developmental evaluation plans versus audit evaluation plans (Edstrom, 2008). In an audit process, evaluation is simply a means to an end where institutions or programmes demonstrate that they meet a standard but then stop the process until the next required review often leaving methods unchanged. A developmental process goes beyond just being accountable for meeting a standard to critically informing change. It is formative in nature where the audit process is more summative. In developmental processes, institutions fully embrace the idea of quality assurance and make evaluation an integral part of growth and development (for both the curriculum and faculty). The evaluation process must become part of the culture. This fits with Ewell's principles of response (Ewell, 2009) which offers guidance on ways to ease tension between audit and developmental processes using four principles including responding visibly to domains of legitimate external concern, showing action on the results of assessment, emphasizing assessment at the major transition points, and embedding assessment in the regular curriculum.

Ewell (2009) contends that implementing continuous improvement is not easy and most institutions lack the will to 'show action' by closing the loop on assessment results or they simply do not know how to implement evidence-based continuous improvement. The principles outlined in this chapter will help institutions devise a strategy to make evaluation part of the culture and every-day processes of the institution.

What is evidence-based continuous quality improvement?

CQI is meant to improve processes, services and outcomes through teamwork. It is an ongoing cycle of collecting data and then testing, implementing, learning from, and revising solutions.

Besides creating an inquisitive CQI culture in an organization, the key to any CQI initiative is using a structured planning approach to evaluate the current processes and improve systems to achieve the desired outcome and vision for the desired future state.

Tools commonly used in CQI include strategies that enable team members to assess and improve outcomes and services. One of the most widely used models is the PDSA cycle, developed by W. Edwards Deming ([Deming, 1986](#)), which presents a cyclical model for problem solving through phases known as plan, do, study and act. For focusing on evidenced based CQI in curriculum and faculty evaluation, we have adapted this idea to the CAPA-CAR model which represents expanded phases for considerations unique to curriculum and faculty, such as the context and approval phases. [Fig. 50.2](#) shows a graphic of the CAPA-CAR model with short descriptions for each phase.

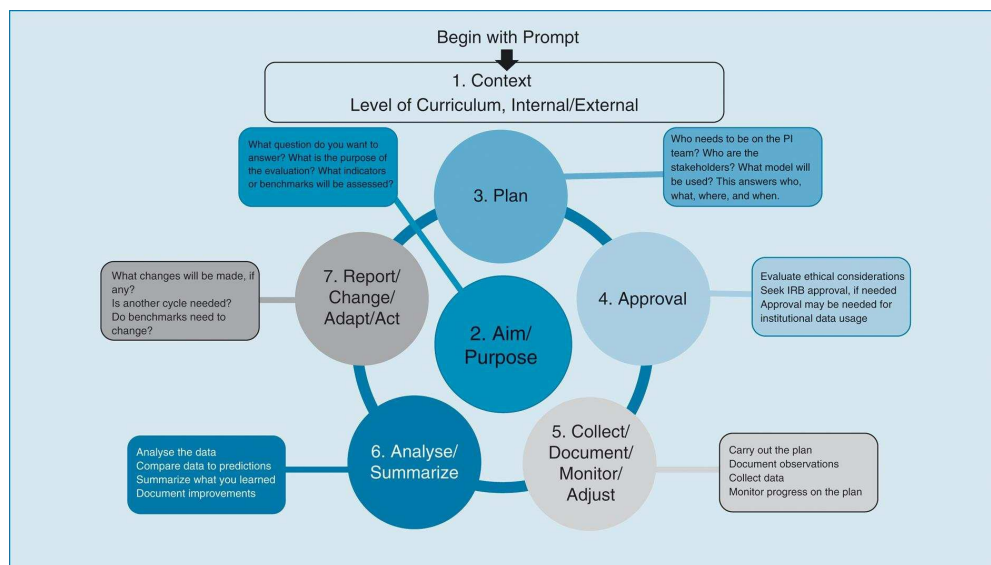


FIG. 50.2 CAPA-CAR model. *IRB*, Institutional Review Board; *PI*, professional identity.

Potential model for evaluation

Every evaluation project will start with a prompt, this prompt can be a problem/issue (e.g., student scores on a subcomponent of a national examination decrease), a question (e.g., are we teaching enough geriatrics in the curriculum?), or just a routine evaluation action (e.g., faculty evaluations at the end of each course). Once the prompt has been identified, the CAPA-CAR model will be initiated.

Steps in the CAPA-CAR model

Step 1: Context

With any evaluation process, the prompt will engage the CAPA-CAR model. It is important to consider the context for the evaluation in the first step. For purposes of curriculum and faculty evaluation, the context sets the stage for the evaluation by defining the level of influence (will the evaluation be for internal or external reviewers/purposes?) and type of curriculum (the level at which the evaluation will take place). As a note to readers, although labelled 'type of curriculum', faculty evaluation fits with both the taught and, more granularly, the perceived curriculum.

Levels of influence and types of curriculum

Determining the level(s) of influence on evaluation and type(s) of curriculum will be important for all phases of the evaluation process. This information is especially useful in setting specific aims/goals for the evaluation and defining the scope of the evaluation plan.

The levels of influence can bring forth different questions to be answered. For example, accreditation (external level of influence) involves self-study and external quality review to ensure that institutions maintain not only the required standards for quality but also ensure a process for quality improvement. The external, macro-level of evaluation (conducted by an accrediting body) on curriculum and faculty may answer macro-level questions whereas internal, meso- or micro-level evaluation efforts can have more detailed and in-depth questions.

The same is true for the types of curriculum. The perceived curriculum may require significant interaction with faculty whereas the experiential or attained curriculum might involve more interactions with students. The various influences and types of curriculum are illustrated in [Table 50.1](#). The internal and external factors can match to the organizational levels (macro, meso and micro) of curriculum ([van den Akker, 2004](#)). These organizational levels can feed into the general types of curriculum (declared, taught and assessed) described by [Harden \(2001\)](#). The levels can get even more granular as described by [Akker \(2003, 2004\)](#).

Table 50.1 Levels of influence and types of curriculum

| Levels of influence | | Types of curriculum | |
|---------------------|--|--|--|
| Influences | Organizational levels (van den Akker, 2003) | Harden (2001) | Akker (2003, 2004) |
| | | | |
| External | Macro (Government, educational systems, accrediting bodies, Society) | Declared curriculum (what it is assumed the student is learning) | Ideal curriculum (the original version underlying a curriculum; basic philosophy, rationale, or mission) |
| Internal | Meso (Institution, Faculty) | | |

| | | | |
|----------|--|---|---|
| External | Macro (Government, educational systems, accrediting bodies, Society) | | Formal curriculum (the vision elaborated in a curriculum document) |
| Internal | Meso (Institution, Faculty) | | |
| Internal | Micro (Classroom, Faculty) | Taught curriculum (as it is delivered to the students) (content, time, strategies for teaching and learning to take place) | Perceived curriculum (the curriculum as interpreted by its users (faculty)) |
| | | | Operational curriculum (the actual instructional process in the classroom as guided by previous representations— often referred to as curriculum-in-action or the enacted curriculum) |
| Internal | Nano (individual) | Assessed (what students actually learn) | Experiential curriculum (the actual learning experiences of students) |
| | | | Attained curriculum (the resulting learning outcomes of students) (knowledge, skills, and attitudes learners demonstrate as a result of teaching and learning) |

Different decisions, actions, stakeholders and models may be used for evaluation at each level or type. With so many possible evaluation targets, the curriculum evaluation process can become daunting which is why defining the context is so important. However, the most important step in the evaluation process is Step 2 the phase at which the aims, purposes, and objectives for evaluation are set.



Tip

The purpose of an evaluation is critical and should be determined in the initial phase of any evaluation plan.

Step 2: Aim/purpose

There may be a prompt for an evaluation project but that does not ensure a clear aim/purpose for the project. That is why the most important step to conducting your evaluation is to understand what you want to evaluate and develop the purpose for the evaluation. What is the specific purpose, aim or goal for the evaluation? What are the specific questions that you want to answer? This will become the overarching guide for

the evaluation project and set the stage for all other phases of the model.

Who determines the overall aim/purpose for the evaluation project? As mentioned, the prompt for the evaluation may come from any situation, group/committee, or individual. The Curriculum Committee may review national board performance and realize that it would be useful to have more information on how the curriculum is preparing students for the specific subcomponents of the exam. This may lead to an aim/purpose for evaluation related to the review of how students perform in the curriculum on the subcomponents on the examination to determine gaps or weak spots in the curriculum. Although this prompt came from the Curriculum Committee that does not mean that the members of the Curriculum Committee are the best 'team' to carry out the evaluation. That is where a good evaluator will bring forth expertise that can inform the specific aim/purpose (based on the influence and type of curriculum) and set the stage for the next step of planning the 'team', identifying the stakeholders, creating more specific objectives, identifying the best evaluation model, and so on. The prompt should be given to an experienced evaluator to carry it forward through the rest of the phases.

Step 3: Plan

Now that the context and aim/purpose has been defined based on the prompt, we are ready to plan the evaluation. This includes determining the 'team'. The team should be a good mix of all stakeholders who can support the evaluation process and provide the needed information for carrying out the process. Some things to consider in this phase include:

1. Who are the key stakeholders that need to be involved? The team will discuss the opportunity for improvement and decide if the aim/purpose are appropriate or if there are further question(s) they want to answer based on the aim/purpose. They may even modify the aim/purpose. These initial guiding points can be in the form of questions or can be more specific objectives using the SMART criteria ([Box 50.1](#)). The use of the SMART criteria in this step can be particularly helpful to expand the more general aim/purpose outlined in the previous step to something more measurable. Without describing measurable questions, the evaluation project can suffer.
2. What is the timeline for the project? The team will need to create timelines/set deadlines, and so on.
3. What is currently happening? The team should think about the current situation and approaches being used. What is causing the problem to exist? What is happening in the curriculum or with a faculty member currently?
4. What are the potential issues and solutions? At this point, the team brainstorms possible solutions to the problem and selects a potential solution that might best address the problem. If students are consistently lower on the biochemistry subcomponent of the national examination, what are the potential reasons for this that could inform questions for review? What could be a solution to analyse?

5. What could be reviewed for improvement? What are the key indicators or targets? The team should develop a theory for improvement which is a prediction of what will happen and develop a strategy for how to test for improvement (e.g., who will oversee the improvement plan, what materials will be needed, when will it occur, etc.)
6. What are the data collection processes if data will need to be collected? Will surveys be needed? Is there a validated instrument to use (especially for faculty evaluation)?
7. What is the specific analysis to be undertaken? There are various models of evaluation that can support the analysis. In this section, we will touch on the planned versus emergent models, but alternative models can be found in the literature.

Box 50.1

What is the SMART criteria?

| | | |
|---|------------|--|
| S | Specific | What will be accomplished? What actions will you take? |
| M | Measurable | What data will measure the goal? How much? How well? |
| A | Achievable | Is the goal doable? Do you have the necessary skills and resources? |
| R | Relevant | How does the goal align with broader goals? Is the result important? |
| T | Time-bound | What is the time frame for accomplishing the goal? |

From Doran, 1981.

Planned versus emergent analysis

Data can come from baseline, process, and product measurements. As [Durning et al. \(2007\)](#) point out, baseline measurements are necessary to determine ‘how learners change’. They serve as benchmarks and are especially important in determining the effect of the curriculum on the learners. For example, if we do not know how students performed in prior courses or prior students performed in a course, we cannot ensure that improvements caused the change or if some other variable caused it. Process measurements monitor learners during a course or activity and are collected in real time. There can be multiple process measurements so clear questions using SMART criteria are crucial. Product measurements are how learners do in a course. Are they successful overall? This is the area that many institutions focus on, but it is not always the most critical measurement when determining quality improvement efforts. [Durning et al. \(2007\)](#) provide a nice table ([Table 50.1](#)) that summarizes baseline, process, and product measurements for undergraduate and graduate medical education that might be useful to readers. There are other proposed models in the literature that can help with the planning phase, as well including the Contest, Input, Process and Product (CIPP) Model ([Stufflebeam, 2003](#)), Logic Model ([Frechtling, 2007](#)), Kirkpatrick Framework ([Kirkpatrick, 1967](#)), Experimental/quasi-experimental models ([Stufflebeam & Shinkfield, 2007](#)), and 12 Step Benchmarking ([Hacker & Kleiner, 2000](#)). Any of these models or frameworks could be appropriate depending on the questions outlined.

8. Are additional resources needed? Some evaluation plans may use methods that require additional funding or support. For example, if it is determined that student evaluations of each session of the curriculum are needed and there is a limit on the number of students who are willing to volunteer for the project, it may require funding to pay student time to participate in the project.
9. Do individuals outside the team need to be involved? For example, is a statistician needed to run analysis on the data?

Similar to doing a research protocol for a research study, evaluators should develop a protocol for all evaluation efforts. This will help ensure that all evaluation elements are consistently outlined and considered before the evaluation process. An evaluation protocol could include headings, such as:

1. Aim/objectives
2. Specific evaluation question(s)
3. Indicator
4. Targets
5. Data source
6. Data collection
7. Data analysis

After a plan has been established, there may be approvals needed to move the plan forward. This brings us to step 4.

Step 4: Approval



Tip

Ethics and informed consent should be reviewed to ensure safeguards are in place to protect participants (e.g., faculty, students) before any data are collected.

Curriculum and faculty evaluation has the potential to involve human beings so ethical issues must be considered. As mentioned earlier, evaluation is a type of research; evaluators research and study the components of a programme or curricula to determine how and to what extent it works. Therefore teachers or students may be involved whether participating, leading the programme, overseeing, or relying on the programme to make a difference. It is the responsibility of the evaluator or evaluation team to protect any human subjects during evaluation activities.

Before collecting any data, check with your institutional administrators to see what policies and procedures are in place for conducting evaluations. Is there an Institutional Review Board (IRB) that must be consulted before conducting an evaluation? Are there formal human subjects review procedures that must be followed? Does the evaluator need to obtain approvals or collect permission forms?

If institutional data (e.g., students grade point average, student national board scores, etc.) will be used, are there approvals that have to be obtained to use institutional data for analysis? Failure to answer these questions before data collection can be detrimental to the evaluation process. Once you are confident that all measures have been taken to get approvals, you are ready for step 5. This is the real work of the process.

Step 5: Collect/document/monitor/adjust

This step involves collecting the data or, if it is a follow-up evaluation, carrying out the improvement plan to test a new question. The team should document observations, collect data (both quantitative and qualitative may be appropriate depending on the question), and monitor progress on the plan to ensure timelines/deadlines are met.

In addition, a big piece of this step is adjustment. In most evaluation instances, we are developing the plan before implementation in a very simplified way with the assumption that events occurring under the same conditions will produce similar results. However, educational interventions are not so simple. These interventions are dynamic, complex, and everchanging. (Gamble, 2008; Patton, 1994). Therefore we have to consider what is actually happening in the moment versus what we predict will happen based on our aim/purpose. There will be unintended, hidden, or null curricular elements that surface and must be considered. Perhaps we are unable to collect all the data we had outlined in the collection step, the existing data are not accessible, the data were available but the quality was not as good as we had expected (e.g., too much missing information or recording errors), or we were unable to get enough programme participants to respond to our survey or agree to an interview. If we fail to make adjustments, or ask additional questions in the moment, we cannot capture the unintended processes and outcomes that emerge.

Once all evidence or data has been captured and adjustments have been made, it should be analyzed and summarized so that reporting (and changes or improvements) can happen. Step 6 discusses this phase.

Step 6: Analyse/summarize

In this step, we will analyse the results and summarize the findings so that a more formal report (Step 7: Report/change/adapt/act) can happen and change can take place. The data should be used to study the result and compare the results against the baseline data. The team should discuss the overall impression of results and summarize those for the next phase.

Step 7: Report/change/adapt/act

This step sets the developmental evaluation process apart from the *audit* process. It is very important to ensure that this step is not forgotten. Any evaluation process should have a plan for how the actions will feed forward into a future or new CAPA-CAR cycle. It will likely be important to review baseline 'quality indicators' or benchmarks and revise to accommodate new information found in the evaluation process. When thinking about revision of benchmarks, it might be good to consider the different levels of benchmarks as described by Henderson-Smart et al (Henderson-Smart et al., 2006)

Items to consider for Step 7

1. Based on the summary of findings, the team may be ready to report the results. If so, the team will need to determine the appropriate stakeholders, committee, or individuals to include in the report.
2. What is the best way to report the findings? Written report? Oral presentation? Email communication?
3. At this point, the team may also find that something unexpected happened. This will need to be documented clearly so that future teams know exactly what happened or did not happen and what was done to address it or if something needs to be done differently in the future.
4. The team may need to go back to the evaluation questions and reexamine the indicators and measures. Is there another measure that can be used? Is there another indicator you can use to address your evaluation question? Think creatively about what data you might be able to access or collect. Document what happened, explain what alternatives you are pursuing, and amend your original plan to accommodate the change (ensuring that you get all necessary approvals for the amendment).
5. The team will need to decide what to do with lessons learned. The team can continue with the improvement, test the improvement under different circumstances through a new CAPA-CAR process, or abandon the change and try a new solution to the problem.
6. The team will also need to establish future plans. This is where the team works to build on what was found and makes plans for additional CAPA-CAR cycles to continue to monitor plans and improvements. This is where benchmarks can be revised or new benchmarks set to inform future CAPA-CAR cycles.
7. Do any instruments or forms need to be modified or developed to capture future data? The development of a self-assessment form can be very useful in both course and faculty evaluations.

Developing a final report for distribution

Evaluation reports or presentations typically have a common format which closely resembles the components of any research report. In evaluation reports, the most important part of the report will likely be the executive summary or overview which should note key findings. This is the most important part of the report because some may only read this section. Other sections might include:

- Introduction (including programme background and theory)
- Evaluation design (including model, aim/purpose, evaluation questions, and evaluation methods)
- Results (including all findings from the evaluation, organized by evaluation question)
- Conclusions (including your interpretation of the results)
- Recommendations (including how the programme should proceed based on

your findings) or

- Limitations (including limitations based on evaluation design, analysis of data, and interpretation of findings)

This CQI process can be used at all evaluation levels from institutional evaluation to curriculum evaluation to faculty evaluation. The big modifications will be in the aim/purpose and plan. In addition, this process can help identify gaps in the expectations from the design of the curriculum, to the interpretation by the faculty teaching it, and the knowledge, skills, and attitudes that students attain from it. These differences can have an important impact on curriculum, teaching and faculty evaluation and shape the teaching and learning.

Specific to faculty evaluations

As with our previous discussions, institutions need to spend some time outlining the purpose for faculty evaluations that can truly feed forward in the overall evaluation plan for the institution. Institutions need to decide if faculty evaluation is going to be teaching focused, learning focused or both. Each focus area could have several possible objects for evaluation as explained by [Edstrom \(2008\)](#). For example, in teaching-focused evaluation, we might evaluate the teacher and the teaching process. In learning-focused evaluation, we might evaluate the learning outcomes and learning process. See [Table 50.2](#) for a description of each possible object for evaluation.

Table 50.2 Summary of objects for evaluation for teachers and learners.

| Object for evaluation | Description |
|-----------------------|---|
| Teaching (teacher) | Students are asked to rate the teacher and his/her teaching abilities |
| Teaching (process) | Students are asked to rate items, such as lectures, labs, recitations and course readings |
| Learner (outcome) | Students are asked to comment on the extent to which they feel they attained the intended learning outcomes. A review of student attainment of learning outcomes is reviewed through assessment data (examination scores, performance on examination items, etc.) |
| Learner (process) | Evaluation would include an inspection of student time on task, distribution of work over the duration of the course, appropriateness of learning activities, indications of approaches to learning, how students perceive the demands in the course, students' conceptions of learning, and approaches to learning |

From [Edstrom, 2008](#).

As [Åkerlind \(2007\)](#) explained, there are multiple approaches (or questions) for developing faculty that need to be considered:

1. Building up one's content knowledge (improving what to teach).
2. Building up practical experience (improving how to teach).
3. Building up a repertoire of teaching strategies (becoming more skilful as a teacher).
4. Finding out what strategies work for the teacher (becoming more effective as a teacher).
5. Increasing one's understanding of what works for the students (becoming more effective in facilitating student learning).

Faculty evaluations need to be structured so that they can be developmental or inform improvements. Historically, evaluation instruments have been deemed more suited for audit purposes than development purposes ([Edstrom, 2008](#); [Richardson,](#)

2005). Student ratings of faculty, if structured in an audit manner, should only be a portion of the overall faculty evaluation. A good mix of evaluation data should be included to ensure a developmental focus on the evaluation. Other possible indicators could be course analyses, how students perform on the faculty member's assessment items or met the faculty member's learning outcomes.

Summary

Medical education is ever evolving and changing with new technologies and advancements. As such, even a well-planned curriculum will change when enacted because of the nature of our educational systems. Also, every person who has a role within the system will have a different curricular experience based on role (e.g., faculty member or student) because each brings his/her own experiences and perspectives to the experience. Therefore quality assurance and evidence-based CQI are essential. Continuous evaluation is required to ensure quality. Both quality assurance and CQI must be part of the institutional culture. This is done through rigorous and ongoing analysis of curriculum and teaching, involving all stakeholders, clearly outlining the aim/purpose, using specific questions or SMART objectives, identifying areas for improvement and developing strategies to refresh benchmarks and standards for continued growth. These can be done effectively at all levels with a model, such as the CAPA-CAR illustrated in this chapter.

References

- Åkerlind, 2007 Åkerlind G. Constraints on academics' potential for developing as a teacher. *Studies in Higher Education*. 2007;32(1):21–37.
- Deming, 1986 Deming WE. *Out of the crisis* MIT Press 1986; Also, visit The Deming Institute website at: <https://deming.org/explore/p-d-s-a>.
- Doran, 1981 Doran GT. There's a S.M.A.R.T way to write management's goals and objectives. *Management Review*. 1981;70(11):35–36.
- Durning et al., 2007 Durning SJ, Hemmer P, Pangaro LN. The structure of program evaluation: an approach for evaluating a course, clerkship, or components of a residency or fellowship training program. *Teaching and Learning in Medicine*. 2007;19(3):308–318.
- Edstrom, 2008 Edstrom K. Doing course evaluation as if learning matters most. *Higher Education Research & Development*. 2008;27(2):95–106.
- Ewell, 2009 Ewell, P. (2009). Assessment, accountability and improvement: revisiting the tension. Occasional Paper #1. National Institute for Learning Outcomes Assessment.
- Frechtling, 2007 Frechtling J. *Logic modeling methods in program evaluation* San Francisco: John Wiley & Sons; 2007.
- Gamble, 2008 Gamble JAA. *A developmental evaluation primer* Canada: The J.W. McConnell Family Foundation; 2008.
- Hacker and Kleiner, 2000 Hacker ME, Kleiner BM. 12 steps to better benchmarking. *Industrial Management*. 2000;42(2):20–23.
- Harden, 2001 Harden RM. AMEE Guide No 21: Curriculum mapping: a tool for transparent and authentic teaching and learning. *Medical Teacher*. 2001;23(2):123–137.
- Henderson-Smart et al., 2006 Henderson-Smart C, Winning T, Gerzina T, King S, Hyde S. Benchmarking learning and teaching: developing a method. *Quality Assurance in Education*. 2006;14:143–155.
- Kirkpatrick, 1967 Kirkpatrick DI. Evaluation of training In. In: Craig R, Mittel I, eds. *Training and development handbook*. New York: McGraw Hill; 1967;87–112.
- Leinster, 2014 Leinster S. Role of accrediting bodies in providing education leadership in medical education. *Journal of Health Specialties*. 2014;2(4):132–135.
- Liaison Committee on Medical Education, 2008 Liaison Committee on Medical Education (2008) Scope and Purpose of Accreditation. Accessed on December 21, 2019 at: <https://lcme.org/about/>.

- Patton, 1994 Patton M. Developmental evaluation. *American Journal of Evaluation*. 1994;15:311–319.
- Richardson, 2005 Richardson JTE. Instruments for obtaining student feedback: a review of the literature. *Assessment and Evaluation in Higher Education*. 2005;30(4):387–415.
- Stufflebeam, 2003 Stufflebeam DL. The CIPP model for evaluation. In: Dordrecht: Springer; 2003;Kellaghan T, Stufflebeam DL, eds. *International handbook of educational evaluation*. vol 9 Kluwer International Handbooks of Education.
- Stufflebeam and Shinkfield, 2007 Stufflebeam DL, Shinkfield A. *Evaluation theory, models, & applications* San Francisco: Jossey Bass/John Wiley & Sons, Inc; 2007.
- van den Akker, 2003 van den Akker J. The science curriculum: between ideals and outcomes. In: Fraser B, Tobin K, eds. *International handbook of science education*. Dordrecht: Kluwer Academic Publishers; 2003;421–447.
- van den Akker, 2004 van den Akker J. Curriculum perspectives an introduction. In: van den Akker J, ed. *Curriculum landscapes and trends*. Dordrecht: Kluwer Academic Publishers; 2004;1–10.
- Van Zanten et al., 2008 Van Zanten M, Norcini JJ, Boulet JR, Simon F. Overview of accreditation of undergraduate medical education programmes worldwide. *Medical Education*. 2008;42:930–937.

Medical Education Leadership

Judy McKimm and Kirsty Forrest

Trends

- Medical educators need leadership, management and followership skills—the ‘leadership triad’.
- These skills are essential for organizational, team and individual success.
- There is no ‘perfect’ leadership style or approach—leaders need to work adaptively and flexibly.
- Understanding systems thinking and complexity is vital to effect sustainable change.
- Understanding that change may need leaders to become advocates and activists.

Key concepts

- Management: planning, providing stability and order (doing things right).
- Leadership: change, setting direction and adaptability (doing the right thing).
- Followership: the ability to work toward defined goals while being part of a team (doing the right things together).

Introduction

Medical educators are involved in teaching, facilitating learning, curriculum design and development, assessment, evaluation and managing teams, departments and programmes. All require some form of leadership, whether this is leading a project team, ensuring the right clinical learning environment or leading new programme development. Effective leaders have followers, take responsibility, do the right things and achieve results ([Drucker, 1996](#)). We often think of 'leadership' as associated only with formal senior management positions, but this is not the case. Medical educators can take both 'big L' (big projects, senior positions) and 'little l' (teams, classrooms) leadership roles, and individuals routinely switch between leadership, management and followership roles, depending on context and demands ([Bohmer, 2010](#); [Till & McKimm, 2016](#)).

In all sectors, leadership is seen as essential for organizational success, whereas poor leadership or management plays a major part in failing organizations ([Kotter, 1990](#)). Internationally, doctors are being called upon to be more engaged in the leadership and management of clinical services, which has led to an increased emphasis on learning leadership in education and training programmes. This requires medical educators to be much more aware of their practice as leaders and role models as well as providing education around leadership.

An extensive leadership literature has discussed whether specific qualities, attributes, knowledge or skills are more effective in different organizational situations. And although many leadership attributes and skills are generic, identifying the unique issues, challenges and opportunities in medical education helps to strengthen capacity of educational organizations to improve individual leaders' performance, thereby enhancing the experience of faculty, learners and, ultimately, patients.

Medical education leadership involves:

- Roles played out in a highly visible, regulated and complex environment: a 'crowded stage'
- Working across multiple, constantly changing organizational boundaries (higher [tertiary] education environments, community settings and complex health services)
- Producing highly skilled, socially accountable professionals.

The 'leadership triad'

Leadership, management and followership are interrelated activities – the 'leadership triad' (McKimm et al., 2016). Whereas many writers in the past clearly differentiated between these, this somewhat artificial distinction unfortunately promotes the idea that leadership is more important than management or followership. It is useful to think of 'leadership' as primarily all about 'people', their needs, idiosyncrasies, emotions and relationships, and 'management' as concerned with processes, systems and structures: both are needed and contemporary theory emphasizes that individuals need to be able to balance all these activities to be effective in the workplace. In terms of management, this ensures that a compelling vision offered by a leader with which people engage is supported by an implementation plan, that operations and accountabilities are maintained and monitored, and that change and innovations are enabled. For example, if the vision cannot be translated into activities that work on the ground and make a difference to improving the performance of an organization or a learner, then the vision is illusory. Similarly, during, for example, curriculum change, whilst leadership focuses on motivating people (followers) to implement the changes, management of processes is crucial to ensure key systems and structures remain stable.



"Our understanding of leadership is incomplete without an understanding of followership."

Uhl-Bien et al. (2014)

The followership literature moves away from leader-centric theories which can have the disadvantage of overattributing a leader's activities to outcomes and minimizing or ignoring the contribution of followers. Instead, outcomes are seen as the result of a dynamic, fluid, cocreative process between leader and follower in which followers and leaders influence one another.

When followers are engaged and active, they can help and support even relatively poor or inexperienced leaders, however, followers can also undermine a leader's authority and effectiveness, despite positional or other power. This can be partly explained by the implicit leadership theories (Derler & Weibler, 2014) which suggest that people, groups and organizations have beliefs about 'good' or 'bad' leadership. These beliefs are culturally derived and often rest on historical factors, unconscious bias or characteristics of individuals unrelated to actual leadership performance or capabilities. Such characteristics include gender, age, ethnicity and professional background (Mannion et al., 2015). An inclusive leadership approach that recognizes these issues, welcomes diversity and challenges biases in self and others can help to generate new perspectives and creativity and provide a sense of belonging that followers need (Hollander et al., 2008).

Leadership theory and practice

In this section, we describe some leadership theories and models that are most relevant to medical education with practical examples. [Table 51.1](#) summarizes a wider range of leadership theories and their key features found in the literature. Leadership theories provide lenses and explanatory frameworks for understanding situations and reflecting on and improving practice. Just as in education, some theories are more prominent than others at various times; however, being able to take these different perspectives provides opportunities and ideas for leadership practice and development.

Table 51.1 Leadership theories and approaches

| Leadership theory or approach | Key features |
|---|---|
| Adaptive leadership | This leader facilitates people to wrestle with adaptive challenges in complex systems or environments for which there is no obvious solution. |
| Affective leadership | Involves expressed emotion, the 'dance of leadership'. |
| | Leaders rapidly assess the affective state of the other, analyse their affective state and select the appropriate affect to display to achieve the desired (or best achievable) outcome. |
| Authentic leadership | Extends from authenticity of the leader to encompass authentic relations with followers and associates. These relationships are characterized by transparency, trust, worthy objectives and follower development. |
| Caring leadership | An approach which implies that leaders are morally obligated to care for their followers. |
| Charismatic leadership | Hero leader, strong role model, personal qualities important, such as communication, 'leader as messiah' — prototype 'great leader'. |
| Narcissistic leader | One issue is that an organization invests a lot in one senior person, often seen as rescuer, does not recognize human fallibility. |
| | A narcissistic leader is self-absorbed and arrogant, fails to distribute/share power and can lead organization to destruction. |
| Collaborative (shared, collective) leadership | Ensure all those affected are included and consulted. |
| | Work together (networks, partnerships) to identify and achieve shared goals. |
| | The more power we share, the more power we have to use. |
| Compassionate leadership | A current approach in healthcare leadership which focuses on the role of leaders in bring compassion (incorporating strength and humility) to both staff and patients. |
| Contingency theories | Leadership style and approach varies according to (contingent on) the situation or context in which leaders find themselves. |
| Destructive (toxic) leadership | Leaders' personalities make them less effective or inappropriate as leaders. |
| The Dark Triad | Extreme personality traits may lead to highly toxic behaviours: subclinical |

| | |
|---|--|
| | narcissism, psychopathy and Machiavellianism. |
| Dialogic leadership | Promotes inquiry and advocacy practices to explore possibilities and stimulate creative thinking through dialogue. |
| Distributed, dispersed leadership | Informal, social process within organizations, open boundaries, leadership at all levels, leadership is everyone's responsibility. |
| Eco leadership Ecoethical leadership | Socially responsive and accountable, emphasizes connectivity and interdependence, environmentally aware, promotes sustainable health professions' education. |
| Emotional intelligence (EI) | Comprises self-awareness; self-management; social awareness; social skills: can be learned. |
| Engaging leadership | Nearby leadership, based on relationship between leaders and followers. |
| | Effective style for public services, although culturally located. |
| Followership | Followers are as important as (if not more than) leaders. |
| | All have different styles and behaviours that impact on leadership. |
| | A mix of followers is helpful; take care not to stereotype. |
| Implicit leadership theories (ILTs) | We all hold implicit ideas about who leaders should be, how they should and should not behave often out of unconscious awareness—leads to stereotyping and people who do not 'fit' being not seen as a leader or potential leader. |
| Inclusive leadership | Welcomes diversity of people and ideas, surfaces and challenges unconscious bias in self and others. |
| Leader-member-exchange (LMX) theory | Every leader has a unique, individual relationship with each follower. |
| | These relationships differ in terms of the quality of the interactions based on whether the follower is part of the 'in-group' or 'out-group'. |
| Ontological leadership | 'Being' a leader is central, in terms of process, actions and impact on others and self. |
| Relational leadership | Emerged from human relations movement, leadership can only be carried out through relationships. |
| | Leaders motivate through facilitating individual growth and achievement. |
| Servant leadership | Leader serves to serve first, then aspires to lead; concept of stewardship and leaving a legacy is important. |
| Situational leadership | Leadership behaviour needs to adapt to readiness or developmental stage of individuals or the group, for example, directing, coaching, supporting, delegating. |
| Trait theory | Based on personality traits and personal qualities, |
| 'Great man' theory | For example, 'big five' personality factors: extraversion, agreeableness, conscientiousness, neuroticism, openness to new experience. |
| | 'Great man' 'theory' based on predominance of male leaders in history and relative absence of women leaders. |
| Transactional leadership | Similar to management, relationships seen in terms of what the leaders can offer subordinates and vice versa. |
| | Rewards (and sanctions) contingent on performance. |
| Transformational leadership | Draws from humanistic psychology. |
| | Leads through transforming others to reach higher order goals or vision. |

| | |
|------------------|---|
| Value-led | Values and morals underpin approaches and behaviours. |
| Moral leadership | |

Personal qualities and attributes

Early theories of leadership saw leadership as a concrete phenomenon, focused primarily on personality traits and personal qualities, with the (stereo)typical leader being a charismatic, inspiring individual. In many societies, reflecting patriarchal structures, historical traditions and storytelling in which the role of women was largely invisible, the 'leader' equated with both being a man and with masculine characteristics (McKimm et al., 2015). These early theories are therefore sometimes called the 'great man' or 'hero-leader' theories and still have resonance today. Effective leaders understand themselves well, continue to learn and develop, seek feedback and can communicate well with others. This reflects the move away from the charismatic hero leader towards a more relational, person centred or authentic leader who is very aware of how they think and behave and purposefully attends to and nurtures relationships.

In the unpredictable and everchanging world of medical education, a transactional leadership approach which relies on extrinsic motivators, such as material reward and recognition, will not fully motivate and engage people (Bass & Avolio, 1994). Authentic leaders attend to people's search for meaning and connection, genuinely relate to others, support optimism and display resilience which contributes to the building of trust, engagement and commitment in others (Avolio & Gardner, 2005; George et al., 2007).

In service organizations, values such as moral purpose, integrity, inclusivity and commitment to a higher purpose are fundamental (Greenleaf, 1977). Leaders therefore need to work with people in an authentic way, display emotional congruence, humility, emotional intelligence and quiet authority. Much of the recent focus of leadership development activities on coaching and personal development reflects this approach. The theories we have described so far emphasize the qualities that 'good' leaders display, but many leaders have a 'dark side' to their personality and can be toxic or destructive within teams and organizations (Jonason et al., 2012). Whereas some leaders are destructive because they do not have the skills or knowledge to do the job, or are unlikable, research is ongoing into personality factors and toxic leadership. Furnham et al. (2013) reviewed the empirical evidence around the Dark Triad, the three overlapping personality traits of narcissism, Machiavellianism and psychopathy. When these traits are extreme, this type of manipulative, self-serving, forceful, self-aggrandizing leadership is highly damaging and can lead to bullying and other toxic behaviours. However, effective leaders need a 'right amount' of these characteristics (toughness, social influence, self-confidence, political 'savvy') combined with emotional resilience and stability to succeed (Kaiser et al., 2015).

Leadership is context dependent

In the late 1980s, the idea that leadership behaviours could be learned (rather than leadership being bestowed or earned) gained prominence. As their names suggest, the contingency or situational leadership approaches propose that leaders should adapt their behaviours according to the situation or context. [Hersey and Blanchard \(1993\)](#) suggest that leaders should flexibly shift between four behaviours: directing, coaching, supporting and delegating in response to the follower's or group development. If followers are less confident, capable or willing, a directing or coaching approach is appropriate. With increased capability and confidence, leaders need to shift to more supporting or delegating styles. This helps leaders to provide flexible leadership to individuals, committees, task forces or teams.

Often medical education leaders prefer the coaching and supporting roles, where they still have a hand in the work, however delegating to a willing and capable group or individual is essential and enables succession plan.

The contingent leader also assesses the context to determine the most appropriate leadership style. [Goleman \(2000\)](#) proposes that the emotionally intelligent leader can adapt to the context by drawing from six leadership styles:

- Coercive
- Authoritative
- Pacesetting
- Affiliative
- Democratic
- Coaching

Leaders who use the authoritative, affiliative, democratic and coaching styles outperform those who use fewer and other styles. The authoritative style has the most strongly positive impact on organizational climate. The authoritative leader presents a compelling future vision and direction, maximizes engagement and commitment to the organization's goals and generates trust. The affiliative, democratic and coaching styles emphasize emotional harmony, consensus and support and development, respectively. Often medical education leaders have little formal power or authority, so engaging people around aspirations, valuing them and ensuring that voices are heard can be effective. Importantly for medical education leaders (who are often high-performing clinicians or academics), pacesetting leadership can have a negative impact on organizational performance, leading to the leader becoming alienated and resented by colleagues as they struggle to keep up to (sometimes) unrealistic standards or pace of work.

Leading groups and teams

Leadership is often about effecting change through team and group working. Drawing from humanistic psychology, 'transformational leadership' (a widely cited theory) focuses on stimulating the followers in the organization to transcend their own self-interest for a perceived greater organizational good ([Bass & Avolio, 1994](#)). This approach emphasizes motivating group members by raising their awareness of and motivation for idealized goals and values. This is achieved through role modelling, influencing skills and providing leadership tailored to enabling people to see the alignment of their own personal and professional goals with those of the organization to effect positive change. In a similar vein, [Kouzes and Posner \(2002\)](#) describe five leadership practices: model the way, inspire a shared vision, challenge the process, enable others to act and encourage the heart. These leaders articulate and role-model their values and moral standards, leading others to trust and respect them, creating a shared vision that arises from the collective, which then inspires participation. They foster a supportive climate by nurturing, coaching and developing people to create and contribute to something that is greater than the local and immediate needs, such as curriculum development, or other educational innovations or adaptations.

In the knowledge-based and networked world of medical education, the ability to communicate and think together well is critical to team and organizational effectiveness. Dialogic leadership evolved from the field of dialogue. The dialogic leader uncovers, through conversations, people's untapped wisdom, insights and creative potential ([Isaacs, 1999](#)). The leader's role is to ensure that people transparently share their ideas, and do not judge others' ideas. Inclusive leaders facilitate a positive culture which broadens peoples' perspectives and promotes creative problem solving by providing a safe psychologic environment, inviting candid conversations, showing vulnerability, being open to learning, building strong relationships and being able to articulate the common purpose ([Coyle, 2018](#)).

A systems' perspective

Medical schools, their curricula and linked health services are a complex adaptive system (Mennin, 2010) which includes collections of independent-minded individuals who can act unpredictably (Westley et al., 2006). Consequently, medical education leaders need to let go of notions of control, tolerate uncertainty and ambiguity, and collaborate with others to identify the issues and potential solutions. A collaborative, shared or collective leadership approach (West et al., 2015) recognizes that programmes need to adapt to the environment and solutions will emerge from experiments and pilot projects, whose results (failures and successes) will inform further design of initiatives. They collect team members with a diversity of perspectives to ensure the generation of innovative ideas and approaches. For the adaptive leader, discerning whether challenges can be solved with known expertise (technical problems, which reside in the head) or whether new learning and behaviours are required (adaptive problems, which reside in the stomach and heart) is foundational to their work (Heifetz et al., 2009). Changing curricula demands which require new designs and assessments of clinical capabilities and identities (such as competency-based education) are adaptive challenges that require new learning. The leaders' work is to mobilize and facilitate people wrestling with these issues on the front line (or 'dance floor') to be able to solve challenges, while keeping the picture of the whole education system in mind (looking down from the 'balcony'). The adaptive leader maintains focus on issues by asking difficult ('wicked') questions that enable conflicts and sensitive issues to be surfaced and addressed. Rather than telling people how to manage the problem, they assist the team in receiving the information they need to know and facilitate discussion of the difficult questions to enable them to make decisions.

In reality, leaders often fulfil many roles and operate within multiple discourses and realities as situations demand. The challenge for the current medical education leader is to achieve balance whilst operating in complex and constantly changing environments, managing, as well as leading, and doing all this with compassion, authenticity and efficiency. Western (2012) offers us the paradigm of ecoleadership which has elements of other approaches and takes an ecologic perspective. The ecoleader works within open systems, within networks and connectedness. We also suggest that, in light of the urgent need for sustainable healthcare and health professions' education, we need to combine an ecoapproach with an ethical or moral stance: 'ecoethical leadership in which leaders take responsibility for helping to address issues relating to environmental change (McKimm & McLean, 2020).



"Eco-leadership is about connectivity, inter-dependence and sustainability, underpinned by an ethical, socially responsible stance ... it is fuelled by the human spirit, for some this is underpinned by spirituality, for others not."

Western (2012)

Accountability, advocacy and activism

As you can see, our understanding of leadership is constantly shifting; it is not a static concept. Over the last few years, many health professionals and educators have become more politicized and we see a current shift in the way doctors and health professionals see themselves as leaders, combining accountability, advocacy and activism. This involves putting core values into action and incorporating these into everyday behaviours. Although we are all accountable for our own actions, behaviours and sphere of work (direct influence), at times leaders need to recognize when they need to step up and advocate for their students, learners, colleagues or patients. Moving from accountability to advocacy means a leader needs to develop and rely more on the skills of negotiation, persuasion and conflict resolution. Some of the theories associated with advocacy are relational and inclusive leadership. In terms of advocacy, this would be moving from caring for individual patients in the here and now, to being an advocate for patient and community health within the wider service or system. An educational example would be advocating for diversity among future medical students to represent the diverse communities they will serve.

Not everyone will become an activist, again this is about living your values, but when you feel so strongly that something must 'be done', you may recognize this in others as challenging 'authority' or whistleblowing. The skills required include working with power dynamics and political awareness in complex systems. The theories best applied in activism would be adaptive and collective leadership. In terms of activism, a typical example is the active engagement with many health professions' educators around planetary health and the need to promote sustainable health education for students and practitioners alike.

Summary



"Educators carry the double burden of managing and leading teams and institutions in a rapidly changing educational environment whilst working in close collaboration with a range of healthcare professionals to deliver safe and high-quality patient care."

McKimm and Swanwick (2011)

Medical educators at all levels provide leadership to their learners, colleagues and others which is characterized by its ultimate goal: to benefit today's and tomorrow's patients. This leadership is played out in a complex system which includes university environments, healthcare organizations and other regulatory and professional bodies. Leaders also manage and follow, they understand how to move within these roles seamlessly as they navigate through complexity. This requires understanding of policy agendas, strategy, systems and organizations, as well as knowledge of operational management processes and procedures, without which change and quality improvements will not happen. Effective leaders are also change agents who are comfortable with working in uncertain and rapidly changing environments, holding onto and communicating core vision and values, adapting strategy to external and internal change. Being able to negotiate across and within organizational, professional, department and team boundaries and to work within the 'spaces between' (which is where change is effected) is a vital characteristic.

But leadership is also about knowing yourself and 'people work': emotional labour (Held & McKimm, 2011). So authentic and consistent personal leadership and 'modelling the way' is vital. This is where leadership most closely intersects with where medical education and the practice of medicine are moving: into an arena where the social accountability role of medical schools is being questioned and cocreated, where the concept of being and becoming a doctor and a professional is debated, researched and challenged, and where the importance and impact of emotional labour is acknowledged. Here is where the most recent discussions of leadership in terms of values, relations, authenticity, inclusivity, complexity and ecoleadership can inform the day-to-day practice of all medical educators, whether or not they are in formal leadership roles.

Acknowledgements

With acknowledgements to Susan Leiff for her input to the earlier versions of this chapter, upon which we have drawn heavily.

References

- [Avolio and Gardner, 2005](#) Avolio BJ, Gardner WL. Authentic leadership development: getting to the root of positive forms of leadership. *The Leadership Quarterly*. 2005;16:315–338.
- Bass and Avolio, 1994 Bass BM, Avolio B. *Improving organisational effectiveness through transformational leadership* NJ, Sage: Thousand Oaks; 1994.
- [Bohmer, 2010](#) Bohmer R. Leadership with a small 'l'. *British Medical Journal*. 2010;340:c483.
- [Coyle, 2018](#) Coyle D. *The culture code: the secrets of highly successful groups* Bantam 2018.
- [Derler and Weibler, 2014](#) Derler A, Weibler J. The ideal employee: context and leaders' implicit follower theories. *Leadership and Organizational Development Journal*. 2014;35:386–409.
- [Drucker, 1996](#) Drucker P. Foreword: not enough generals were killed. In: Hesselbein F, Goldsmith M, Beckhard R, eds. *The leader of the future*. San Francisco: Jossey Bass; 1996.
- [Furnham et al., 2013](#) Furnham A, Richards SC, Paulhus DL. The Dark Triad of personality: A 10 Year review. *Social and Personality Psychology Compass*. 2013;7:199–216.
- [George et al., 2007](#) George B, Sims P, McLean AN, Mayer D. Discovering your authentic leadership. *Harvard Business Review* 2007;129–138.
- [Goleman, 2000](#) Goleman D. Leadership that gets results. *Harvard Business Review*. 2000;78:78–90.
- [Greenleaf, 1977](#) Greenleaf RK. *Servant leadership: a journey into the nature of legitimate power and greatness* Mahwah, NJ: Paulist Press; 1977.
- [Heifetz et al., 2009](#) Heifetz RA, Grashow A, Linsky M. Leadership in a (permanent) crisis. *Harvard Business Review* 2009.
- [Held and McKimm, 2011](#) Held S, McKimm J. Emotional intelligence, emotional labour and affective leadership. In: Preedy M, Bennett N, Wise C, eds. *Educational leadership: context, strategy and collaboration*. Milton Keynes: The Open University; 2011.
- [Hersey and Blanchard, 1993](#) Hersey P, Blanchard K. *Management of organizational behaviour: utilizing human resources* 6th ed. Englewood Cliffs, NJ: Prentice Hall; 1993.
- [Hollander et al., 2008](#) Hollander EP, Park BB, Elman B. *Inclusive leadership and leader-follower relations: concepts, research and applications* The

- Member Connector: International Leadership Association 2008.
- Isaacs, 1999 Isaacs I. Dialogic leadership. *The Systems Thinker*. 1999;10(1):1–5.
- Jonason et al., 2012 Jonason PK, Slomski S, Partyka J. The Dark Triad at work: how toxic employees get their way. *Personality and Individual Differences*. 2012;52:449–453.
- Kaiser et al., 2015 Kaiser RB, Lebreton JM, Hogan J. The dark side of personality and extreme leader behavior. *Applied Psychology*. 2015;64:55–92.
- Kotter, 1990 Kotter JP. *A force for change: how leadership differs from management* New York: Free Press; 1990.
- Kouzes and Posner, 2002 Kouzes JM, Posner BZ. *The leadership challenge* 6th ed. San Francisco: Jossey-Bass; 2002.
- Mannion et al., 2015 Mannion H, McKimm J, O’Sullivan H. Followership, clinical leadership and social identity. *British Journal of Hospital Medicine*. 2015;76:230–234.
- McKimm et al., 2015 McKimm J, da Silva A, Edwards S, et al. *Women and leadership in medicine and medical education: International perspectives. Gender, careers and inequalities in medicine and medical education: international perspectives* Emerald Publishing 2015;69–98.
- McKimm and McLean, 2020 McKimm J, McLean MM. Rethinking health professions’ education leadership: Developing ‘eco-ethical’ leaders for a more sustainable world and future. *Medical Teacher*. 2020;42(8):855–860.
- McKimm et al., 2016 McKimm J, O’Sullivan H, Jones PK. A future vision for health leadership. In: Curtis EA, Cullen J, eds. *Leadership and change for the health professional*. Maidenhead: Open University Press & McGraw Hill Education; 2016.
- McKimm and Swanwick, 2011 McKimm J, Swanwick T. Educational leadership. In: Swanwick T, McKimm J, eds. *The ABC of clinical leadership*. London: Wiley Blackwell; 2011.
- Mennin, 2010 Mennin S. Self-organisation, integration and curriculum in the complex world of medical education. *Medical Education*. 2010;44:20–30.
- Till and McKimm, 2016 Till A, McKimm J. Doctors leading from the frontline. *British Medical Journal*. 2016;352.
- Uhl-Bien et al., 2014 Uhl-Bien M, Riggio RE, Lowe KB, et al. Followership theory: a review and research agenda. *The Leadership Quarterly*. 2014;25:83–104.

[West et al., 2015](#) West M, Armit K, Loewenthal L, Eckert R, West T, Lee A.
Leadership and leadership development in healthcare: the evidence base
London: Faculty of Medical Leadership and Management; 2015.

Western, 2012 Western S. An overview of leadership discourses. In: Preedy
M, Bennett N, Wise C, eds. *Educational leadership: context, strategy and
collaboration*. Milton Keynes: The Open University; 2012.

[Westley et al., 2006](#) Westley F, Zimmerman B, Patton M. *Getting to maybe:
how the world has changed* Toronto: Random House; 2006.

The Medical Teacher and Social Accountability

Roger Strasser, Charles Boelen, Björg Pálsdóttir, Andre-Jacques Neusy and James Rourke

Trends

- Social accountability forms the essential foundation for medical practice and medical education.
- Social accountability is a core principle for medical and health workforce education.
- The medical teacher plays a key role in modelling social accountability in practice.

Key concepts

- Population health needs: vary according to social, cultural, geographic, linguistic context and determine health service models and workforce requirements.
- Health equity: allows people to reach their full health potential and receive high-quality care that addresses their needs, no matter where they live, the nature of their health problems, or who they are.
- Social determinants of health: economic and social conditions that influence individual and group differences in health status and health behaviours.
- Partnership pentagram: connecting community members with policy makers, health service managers, healthcare providers and academic institutions to determine and address priority health concerns.

Introduction

The medical teacher is at the intersection of providing medical care today and educating the doctors of tomorrow with the fundamental goal to improve the health of patients and communities now and into the future. Through these vital medical care and education dual roles, medical teachers can demonstrate social accountability by role modelling and actively involving learners in their medical practices, and healthcare and community advocacy. Medical teachers can have a key role in developing their medical school's vision, mission and curriculum and especially in strengthening the school's connection to the communities, regions and nation that it serves.

This chapter provides an overview of social accountability of medical schools ([Box 52.1](#)) and the contributions that medical teachers can make using practical examples from around the world.

Box 52.1

Social accountability conceptual foundation

- Medical doctors (MDs, physicians) have served humanity's needs since the earliest of times.
- As members of the medical profession, doctors are inherently given the privilege and responsibility of caring for patients through an implicit trust created by society and an explicit need structured through legislation and regulation.
- Medical schools, by permit of legislation, regulation and accreditation are entrusted with the education and graduation of future doctors and must take responsibility to provide appropriate medical education that will produce competent doctors ready to meet society's needs.
- Socially accountable medical education extends from the mission of the medical school to its organization, function, curriculum and learning experiences, and outcomes.

Medical teachers connect the community with the school and the learners at every level.

From Rourke (2013).

Social accountability of medical schools

Social accountability is a public commitment to respond to society's priority health needs and challenges—keeping quality, equity, relevance and effectiveness of healthcare as reference values—and to report back on progress to society. For a medical school, it implies graduating doctors who have the skills and commitment to improve the health of the population that they have the privilege to serve. This is reflected in national initiatives, such as the [Future of Medical Education Canada \(2010 and 2012\)](#), international collaborations ([Global Consensus for Social Accountability of Medical Schools, 2010](#); [Pálsdóttir et al., 2008](#); [THEnet](#)), and the World Health Organization's (WHO) new Global HRH Strategy 2030 ([WHO, 2016](#)) and is becoming embedded in evolving accreditation standards ([World Federation for Medical Education, 2015](#)) and aspirational goals ([ASPIRE](#)).



“Medical education does not exist to provide students with a way of making a living, but to ensure the health of the community.”

Rudolf Virchow, 1821–1902

From an educational point of view, a socially accountable school has the triple and intricate obligation to identify determinants of health in society, to produce graduates who are well prepared to address those determinants, and to ensure the best use is made of those graduates in a health system ([Table 52.1](#); [Box 52.2](#)). Consequently, the socially accountable medical school contributes to a more efficient and equitable healthcare delivery system, in part through collaboration with other health stakeholders ([Boelen & Heck, 1995](#)). For instance, to achieve a reduction of health disparity, the school partners with potential employers of graduates to design specific educational programmes and create attractive job opportunities in areas of greatest need.

Table 52.1 Social obligation scale

| | Responsibility ➡ | Responsiveness ➡ | Accountability |
|--------------------------|----------------------|-------------------------------------|-----------------------------|
| Social needs identified | Implicitly | Explicitly | Anticipatively |
| Institutional objectives | Defined by faculty | Inspired from data | Defined with society |
| Educational programmes | Community-oriented | Community-based | Contextualized |
| Quality of graduates | ‘Good’ practitioners | Meeting criteria of professionalism | Health system change agents |
| Focus of evaluation | Process | Outcome | Impact |
| Assessors | Internal | External | Health partners |

From Boelen (2018).

Box 52.2

Socially accountable medical schools

- Have an education, research and service delivery vision, mission, and strategic plan inspired by the current and prospective needs of its immediate society including current and future health system challenges and requirements
- Recruit, support, and promote faculty that are aligned with its social accountability (SA) mission who reflect the demographic and geographic diversity of the medical school's region/nation and will model, teach and develop SA.
- Actively engage and partner with their community, health system and other key stakeholders in designing, implementing and evaluating their education, research and service programmes.
- Select medical students who reflect the demographic and geographic diversity of the medical school's region/nation on basis of their potential.
- Provide a curriculum that reflects the priority health needs of medical schools community/region with emphasis on clinical service learning in partnership with the region's health service organizations.
- Produce graduates with the knowledge, skills and commitment to practice how and where they are needed in the medical schools region/nation.
- Provide professional development/continuing education based on its region's identified health needs for practicing physicians and healthcare workers in its region.
- Engage in ethical research activities inspired by and responding to the health needs of their region/nation and world health priorities.
- Promote this research and evidence-based policy and practice changes to improve health and health service delivery.
- Assess their impact in terms of meeting community/society's priority needs.

From Rourke (2013).



Tip

The essence of social accountability of medical schools is how they engage, partner with, and respond to the needs of their communities.

The notion of impact is essential in social accountability, as confirmed by the GCSA

(Global, 2010). Guided by the uninterrupted thread from identification of health needs in society to health service delivery, a socially accountable school keeps its focus on desired impacts, that is, improving coverage, promoting person centeredness, enhancing healthy life styles, preventing risks and avoidable deaths, and reducing acute relapses in chronic patients. To this end, the school must establish sustainable partnerships with key health actors: public authorities, health service organizations, health insurance schemes, professional associations and communities to ensure the greatest relevance for its work.



“The medical school must: ... consider that the mission encompasses the health needs of the community, the needs of the healthcare delivery system and other aspects of social accountability.”

World Federation for Medical Education (2015)

Medical teachers and social accountability

Medical teachers on the ground empower future physicians with values of social accountability and aptitudes to foster holistic actions for a greater and sustainable impact on people's priority health needs and must be recognized explicitly for their outstanding contribution and rewarded. Medical schools have an obligation to provide medical teachers with faculty development in social accountability and to be guided by their medical teachers in the school's curriculum development and delivery. In addition, medical schools must seek to be acknowledged for efforts in reorienting education, research and service missions towards a more person-centred, equitable and efficient healthcare delivery system. Such transformative reforms in the interest of the public must be included in accreditation by national health and academic authorities. A school accredited for its social accountability is expected to engage in quality and relevance improvement, and its teachers, researchers and practitioners will be motivated to adhere to this process (Boelen et al., 2019).

Canada has made social accountability an essential accreditation component (CACMS, 2019). Although low or middle income countries (LMIC) face constraints to achieve a comprehensive accreditation system, alternative evaluative approaches may be used to assess their level of social accountability, such as the conception-production-usability (CPU) model, the Training for Health Equity network (THEnet) evaluation framework and the International Federation of Medical Students Associations (IFMSA) toolkit. The CPU model recommends that schools and educational programmes assess their threefold capacity: to identify priority health needs and main challenges in society; to adapt their missions and programmes to those needs and challenges; and to ensure that their actions have a greater impact through a sustainable partnership with other key stakeholders (Boelen & Woollard, 2009). The THEnet framework transforms the CPU model into questions enabling schools to identify how to concretely comply with social accountability principles (THEnet, 2011). The toolkit designed by the IFMSA is a good example of what students expect from their educational institutions (IFMSA and THEnet, 2017). The ASPIRE criteria for excellence in social accountability provide a practical inclusive framework that now explicitly connects social and environmental accountability (ASPIRE).

Medical teachers supervising students in practice settings are probably the best advocates to the school leadership for a governance inspired by the social, cultural, demographic and environmental determinants of health as they are direct witnesses that changes must urgently be undertaken for the wellbeing of citizens (Ventres et al., 2018).

The transition from traditional medical education to socially accountable medical education requires a major change in medical school orientation and organization, and the medical teacher is right at the crossroads (Ventres & Dharamsi, 2015). As medical schools are important players in people's health development, markers of social accountability are being integrated into accreditation norms for recognition of excellence, which provides incentives to faculty, particularly medical teachers, to bring

social accountability to life. Teachers are instrumental as they plan, implement and assess educational programmes (Box 52.3). As planners, regardless of their specialty, teachers imbued with the concept of social accountability can argue cogently which are the essential competencies to be acquired by graduates. Similarly, on an educational committee, by referring to what is collectively perceived as the role of the doctor in a future health system, they can moderate debates in favour of a more relevant, balanced and integrated curriculum.

Box 52.3

Socially accountable medical teachers

- Weave social accountability (SA) into the fabric of their medical school's vision, mission, strategic plan, organization and function.
- Participate in their medical school's community engagement and partnership building.
- Bring a community perspective to the medical school's selection/admission process.
- Infuse SA into their medical school's curriculum and medical student experiential learning.
- Develop their own medical practice as a SA role model based on their community needs.
- Involve learners in socially accountable medical practice and community activities, including research projects that focus on community engagement, partnership and responding to priority health needs.
- Inspire their learners to choose careers paths relevant to society's priority challenges and needs.



Tip

Demonstrating social accountability improves medical teacher's practices, communities and medical schools and provides a positive role model for medical students

As implementers, medical teachers can be advocates for early and longitudinal immersion of medical students in the social milieu to enable them to grasp the complexity of determinants of health, identify populations at risk, follow up patients within their families, and prepare them to make more relevant decisions in health promotion and preventive care. In so doing, medical teachers will imbue students with a critical approach to causal effects that should guide them throughout their educational experience.

Medical teachers have an invaluable influence on students as role models in

demonstrating the concrete implications for a socially accountable practice, eventually by spending more time in primary care settings, by working with multiprofessional teams, by applying person centredness approaches, by caring for most vulnerable populations, by treating colleagues and patients with respect and empathy and by engaging and partnering with community leaders. Without compromising their specialized field of expertise, medical teachers also can be health advocates by addressing health issues from a wider economic, cultural and environmental angle and advocating for improving policy and practice towards greater equity, relevance, quality, effectiveness and efficiency.

Finally, teachers can stress the added value of social accountability to the evidence-based paradigm as proofs of impact are sought on targeted health problems in society. They can persuade students of the usefulness of practices inspired by health needs and their multiple causation and guide them in making professional choices most consistent with their ideals. Medical teachers have the potential to be true champions of social accountability and promoters of purposeful changes in the academic institution.

Medical teachers comprehensive roles in socially accountable medical schools

The Northern Ontario School of Medicine (NOSM) and Patan Academy of Health Sciences in Nepal are two medical schools that were developed to embody social accountability from the beginning and illustrate medical teachers vital and comprehensive roles.

In 2005 the NOSM opened as a stand-alone medical school in a rural underserved region of Canada with a social accountability mandate focused on improving the health of the people of Northern Ontario ([Strasser et al., 2013](#)). Distributed Community Engaged Learning, NOSM's distinctive model of medical education and health research ensures that students and residents are learning to practice in the Northern Ontario context. This involves over 90 sites in which local physicians are the medical teachers.

During the 8-month comprehensive community clerkship (CCC), each third-year student is placed in one of 15 communities to learn core clinical medicine from a family practice and community perspective. Students follow patients and their families encountered in the primary care setting over an extended period of time, engaging with a range of community medical specialists and health professionals, so as to experience continuity of care in family practice while also studying different clinical specialty disciplines. Much of the CCC is devised by and in partnership with the host communities.

The medical teachers have a pivotal role in this community engaged, socially accountable education. They provide much of the local clinical and classroom teaching, as well as acting as role models and mentors for the students during their clerkship year. Socially accountable medical teachers challenge students to consider the social determinants of health in each patient and family interaction; undertake research which addresses the health issues in the CCC community; and focus always on responding to the health needs of the patients and families under their care.

In addition, medical teachers help connect the community with the medical school. They have made an essential contribution to the development and implementation of the NOSM programme. Examples include bringing the community perspective to strategic planning; participation in the selection and admissions process; curriculum development including case writing for case-based learning; small group classroom and clinical skills teaching; and faculty development through peer teaching.

Patan Academy of Health Sciences' (PAHS) community-based learning and education is implemented in partnership with communities and Nepal's national health system. The primary goal of the medical school is to improve healthcare delivery in the region by producing well-educated graduates with a community health development orientation who are able and committed to work in the rural areas of Nepal.

The school uses an innovative curriculum focusing on the region's highest priority health needs, teaching pedagogy to foster students' problem solving and independent thinking skills, and a community health development orientation that stresses health

development capacity for enhancing community health status alongside individual medical care skills and knowledge. Local leaders and service providers as medical teachers are engaged as preceptors and in assessing student performance.

Initially, students at rural sites are given the opportunity to analyse simple problems and over time are exposed to complex issues—technical, managerial and societal in nature—as they advance to higher-year postings. Medical teacher role modelling is emphasized through supervisory visits to rural training sites, where faculty members provide clinical services and help build the capacity of local providers. Community members are involved in the student-selection process, especially as assessors of communication skills and of sensitivity, compassion and empathy.

Practical examples of medical teacher social accountability

In their practices, communities and medical schools, medical teachers demonstrate and role model social accountability all over the world. Here are some practical examples:

At **Tours Faculty of Medicine (France)**, practicing physicians (medical teachers) were invited by the dean to be part of a meeting of all main health stakeholders from the centre of France and the Loire Valley region where the school is the only one for a population of 2 million inhabitants. Political leadership, regional health authorities, health professional associations, patient associations and representatives of civil society assembled to identify key health issues in the territory and best ways for the medical school to contribute. A list of priority areas and recommendations for action emerged. A committee representing all partners is charged to prepare an annual meeting for follow-up. Major priorities for the school will be the retention of graduates in underserved areas and the involvement of regional health stakeholders in the medical school's community work. The school experience is viewed by the French association of medical school deans as a model.

At **Memorial University of Newfoundland (Canada)** Faculty of Medicine, over 150 physician part-time and fulltime faculty as medical teachers volunteer as interviewers in an admission process that recognizes rural, Indigenous and economically disadvantaged students may have had different sociocultural and educational experiences but also are more likely to practice in those communities of need. To ensure broad representation, the admissions selection committee includes members from Indigenous communities, rural communities, general public, allied health professions, medical students, biomedical scientists, university, administration, provincial medical association and provincial departments of health and community physicians.

At **Ghent University Faculty of Medicine and Health Sciences (Belgium)**, medical teachers emphasize research and training in community-oriented primary care (COPC) and the school has Chair in 'equity in healthcare.' Family physicians as medical teachers bring medical students into their practices beginning in the students first year. In the second year, students have 2-week clerkship in a nursing home, in the third year they have 1 week of clerkship in family medicine and have a 1 week block as part of 'health and society' interprofessional COPC experience in a deprived area of the city of Ghent. During the second and the third year, students are attached to a family where a child is born. They follow up the development of the child, and interact with the family members. The students interview three primary care providers involved in the care of that family and pay particular attention to social determinants of health. By combining observation from community experiences and epidemiologic data on the community, students, with teacher support, formulate a 'Community Diagnosis.' They then look for ways to improve the social conditions in the community.

Medical teachers at **Ghent University** also model social accountability by having their medical practice in community clinics in neighbourhoods with underserved urban

populations and by taking care of vulnerable populations such as refugees. In 2016 the Department of Family Medicine and Primary Health Care took responsibility for coordinating the care of 250 refugees from Syria, Afghanistan and Iraq. It put together a volunteer team of family physicians, nurses, mental health workers, dentists, pharmacists to organize comprehensive care for the asylum-seekers. This project will try to combine service with research and educational opportunities, contributing to increasing social accountability at Ghent University.

Flinders University School of Medicine with facilities in Adelaide, rural South Australia and Victoria, and the Northern Territory (Australia) values its reciprocal links with Indigenous communities and with the wider Australian and international communities. Indigenous medical teacher academics are involved in recruitment, admissions and support of Indigenous students and the school established the Poche Centre of Indigenous Health and Well-Being in Adelaide and the Indigenous Transition Pathways Unit in Darwin to provide support and mentoring.

At **Southern Illinois University School of Medicine (USA)**, physician faculty as medical teachers provide multiple elective opportunities for students to work alongside them in community service which can include providing cost free care at both the primary care and specialty levels for uninsured patients.

At **Southern Illinois University School of Medicine (USA)**, special individually designed electives ([IDEs]; 'design your own elective') allow students with creative service ideas, with the approval of supervising medical teacher faculty members, to receive elective credit. An example that was done recently was a group of eight students, accompanied by a clinical faculty member as medical teacher, spent 2 weeks in Haiti providing free medical care there.

The **Faculty of Medicine at the University of Gezira (FMUG)** was established in 1975 to serve rural communities in Sudan's Gezira region. At the FMUG medical teachers model approaches and behaviours that will help students in their future practice. For example, FMUG's Safe Motherhood project was initiated by faculty members to improve the health status of rural communities in collaboration with health authorities. FUMG faculty trained village midwives and facilitated their absorption into the government-funded health system. This initiative led to a remarkable reduction in the maternal mortality ratio (MMR) and in the neonatal mortality ratio (NMR) in Gezira state. The project helped lower the MMR from 469 per 100,000 live births in 2005 to 106 in 2011, and the NMR from 43 per 1000 live births in 2005 to 10.2 per 1000 in 2011. Many strategies were applied, including the training and provision of jobs for village midwives in collaboration with Gezira State.

The University of New Mexico School of Medicine (USA) uses social determinant prescription pads for health to help students make the connection between education and service to the school's social mission. Students and residents in primary care work with their preceptors (medical teachers) and community health workers in addressing social determinants of health of patients by 'prescribing' resources for hunger and food insecurity, prescription benefits, housing, employment, education, workforce training and health insurance coverage options.

James Cook University (JCU) in Northern Queensland (Australia), established to

help address the rural doctor workforce shortage, delivers the Australian General Practice Training (AGPT) programme for the Australian Government Department of Health. This postgraduate vocational training programme for medical graduates allows vertical integration of training, producing a cohort of doctors with knowledge, skills and aptitude to meet community need. The Rural Generalist Pathway provides a supported training and career pathway for junior physicians to train in rural and remote medicine, combined with financial and professional recognition. Teaching in both the undergraduate and postgraduate programmes is provided by a distributed network of committed rural and regional preceptors as medical teachers, each modelling social accountability through their skills, service and commitment to community.

The medical and nursing teachers at **University of the Philippines Manila School of Health Sciences (UPM-SHS)** and the **Ateneo de Zamboanga – School of Medicine (ADZU-SOM)** in the Philippines work closely with communities and other health system stakeholders to design, implement and evaluate their programmes. They also build the capacity of their partners to improve health. For example, they developed and implement a Municipal Leadership and Governance Programme in their respective regions. It is a 1-year, two module programme for mayors, municipal health officers and Department of Health officials which offers training and leadership coaching on local health system development for officials who are committed to supporting health reforms. The programme was developed in collaboration with local authorities and trainees have to be endorsed by the Department of Health's Center for Health Development.

Research

Medical schools that are socially accountable undertake research that is inspired by and responds to their community and region's priority health needs. This includes the full range from biomedical discovery to clinical to population health to health services research. The medical school actively engages the community in research, including developing the agenda, partnering and participating in research and knowledge translation/mobilization/application. The research gives priority to activities that create beneficial effects upon its community/region including a positive impact on the healthcare for and the health of the population served. Medical teachers can play a significant bidirectional role, engaging with the community to undertake community needs inspired research and then integrating research findings into medical practice, and involving students in both directions from practice to research to back again.

For example, Newfoundland and Labrador, a large province (400,000 km) with a small population of 500,000 people, has a very distributed founder population that has clusters of genetic disease. Medical teachers in Newfoundland and Labrador have this additional layer of genetic knowledge about patients from different communities that they teach medical students. This population need has inspired Memorial University of Newfoundland Faculty of Medicine to implement breakthrough genetic research that is needed for the province's population, but has worldwide significance, as these diseases are not confined to Newfoundland and Labrador. One such example is arrhythmogenic ventricular cardiomyopathy (ARVC), a disease in which the first symptom is usually sudden death from ventricular fibrillation in young men and women. Researchers at Memorial first identified that this often struck down every other person in the families affected. Initial treatment with implantable defibrillator pacemakers in all family members was found to stop the sudden deaths. The genetic riddle was solved, and a genetic test developed for at risk families to determine exactly who had the gene and put the defibrillator pacemakers in those who really needed them.

With a clearly defined mission to serve rural, Indigenous and tropical Australia, JCU, is engaged in research related to its social accountability mission. In addition to biomedical and basic science investigations, JCU centres its research on rural health, medical education and health workforce and primary healthcare. Medical teachers conduct graduate tracking and retention research; health workforce modelling; and collaborative health services research with Indigenous, rural, and remote populations. The research not only informs strategy and policy making, but feeds directly back into the education process.

Flinders University School of Medicine (Australia) Centre for point-of-care testing has responded to the needs identified by medical teachers who care for populations in very dispersed rural Australia by developing point-of-care devices and trains a range of practitioners including Indigenous health workers to conduct tests for chronic, acute and infectious diseases, particularly in Indigenous communities and rural and remote settings nationally and internationally. This allows for generating a test result that can be used to make an immediate informed clinical decision.

The Philippines suffers from significant health inequities with rural and poor regions lacking access to health workers, especially physicians. In the country, 68% of Philippine medical graduates end up practising overseas. Two health professional schools—ADZU-SOM and UPM-SHS—were designed to address these challenges. Medical teachers at both schools are involved in efforts to assess their school's impact by tracking graduates. Both socially accountable schools have retention rates of more than 90% remaining in the Philippines and more than 80% of graduates working in underserved or rural regions. The research also focuses on determining whether graduates contribute to improvements in healthcare and population health outcomes. A recent study showed that graduates of ADZU-SOM and UPM-SHS compared with graduates of conventional schools in similar geographic areas are over four times more likely to practice in smaller communities and more than three times more likely to practice in poor communities. Using the health of children under the age of 5 years as a proxy indicator, the study showed that children served by graduates of the socially accountable schools received higher levels of pre- and postnatal care, and the health outcomes of the mothers' youngest child were better compared with graduates of the conventional schools.

Summary

Over the past 25 years, social accountability has become firmly established as an expectation of medical schools. By demonstrating and developing social accountability in their medical practices, healthcare systems, communities and medical schools' medical teachers positively impact their patients' and communities' health and healthcare and the next generation of medical doctors.

References

- ASPIRE: International Recognition of Excellence in Education ASPIRE: International Recognition of Excellence in Education. Available at: www.aspire-to-excellence.org.
- Boelen, 2018 Boelen C. Coordinating medical education and health care systems: the power of the social accountability approach. *Medical Education*. 2018;52:96–102.
- Boelen et al., 2019 Boelen C, Blouin D, Gibbs T, Woollard R. Accrediting excellence for a medical school's impact on population health. *Education for Health*. 2019;32:41–48.
- Boelen and Heck, 1995 Boelen C, Heck J. *Defining and measuring the social accountability of medical schools* Geneva: WHO; 1995.
- Boelen and Woollard, 2009 Boelen C, Woollard R. Social accountability and accreditation: a new frontier for educational institutions. *Medical Education*. 2009;43:887–894.
- Committee on Accreditation of Canadian Medical Schools (CACMS), 2019 Committee on Accreditation of Canadian Medical Schools (CACMS) Standards for Accreditation of medical education programs leading to the MD degree effective July 1, 2019. https://cacms-cafmc.ca/sites/default/files/documents/CACMS_Standards_and_Elen_AY_2019-2020.pdf.
- Future of Medical Education in Canada, 2010 Future of Medical Education in Canada. (2010). A collective vision for MD education in Canada. Available at: <https://www.afmc.ca/pdf/fmec/FMEC-MD-2010.pdf>.
- Future of Medical Education in Canada, 2012 Future of Medical Education in Canada. (2012). A collective vision for postgraduate medical education in Canada. Available at: https://www.afmc.ca/future-of-medical-education-in-canada/postgraduate-project/phase2/pdf/FMEC_PG_Final-Report_EN.pdf.
- Global Consensus for Social Accountability of Medical Schools, 2010 Global Consensus for Social Accountability of Medical Schools. (2010). Available at: www.healthsocialaccountability.org.
- IFMSA and THENet, 2017 IFMSA and THENet. Students' Toolkit. (2017). Social Accountability in Medical Schools. Available at: https://ifmsa.org/wp-content/uploads/2017/09/Toolkit-on-Social-Accountability_Final-v.32.pdf.
- Pálsdóttir et al., 2008 Pálsdóttir B, Neusy A-J, Reed G. Building the

- evidence base: networking innovative socially accountable medical education programs. *Education for Health*. 2008;21.
- Rourke, 2013 Rourke J. AM Last Page: social accountability of medical schools. *Academic Medicine*. 2013;88(3):430–443
<http://dx.doi.org/10.1097/ACM.0b013e3182864f8c>.
- Strasser et al., 2013 Strasser R, Hogenbirk JC, Minore B, et al. Transforming health professional education through social accountability: Canada's Northern Ontario School of Medicine. *Medical Teacher*. 2013;35:490–496.
- The Training for Health Equity Network The Training for Health Equity Network. THENet's social accountability evaluation framework version 1. Monograph I. THENet. 2011. URL: www.thenetcommunity.org.
- THENet The Training for Health Equity Network. Available at: www.thenetcommunity.org.
- Ventres et al., 2018 Ventres W, Boelen C, Haq C. Time for action Key considerations for implementing social accountability in the education of health professionals. *Advances in Health and Sciences Education*. 2018;23:853.
- Ventres and Dharamsi, 2015 Ventres W, Dharamsi S. Socially Accountable Medical Education—The REVOLUTIONS Framework. *Academic Medicine*. 2015;90.
- World Federation for Medical Education, 2015 World Federation for Medical Education. *Basic Medical Education WFME Global Standards for Quality Improvement: The 2015 Revision* Copenhagen: World Federation for Medical Education; 2015; Available at: <http://wfme.org/standards/bme/78-new-version-2012-quality-improvement-in-basic-medical-education-english>.
- World Health Organization, 2016 World Health Organization. (2016). Global Strategy Human Resources for Health. Available at: www.who.int/hrh/resources/pub_globstrathrh-2030/en/.

The Educational Environment

Jonas Nordquist and Ingrid Philibert

Trends

- The medical school learning environment (LE) is important to student learning, professional socialization and wellbeing.
- Interest in the LE and its impact on learners and teachers has increased over the past two decades; current focal areas encompasses social, physical/architectural and technologic dimensions.
- The medical school LE is undergoing change because of a broader conceptualization of the role of the medical school as the home of research, postgraduate medical education and an expanding patient care enterprise.
- Ongoing evaluation and improvement of the LE is required by medical school accreditors across the globe.

Key concepts

- Learning environment: the context for learning that results from the combined influence of formal and informal curricula and social/psychologic, architectural/physical, technologic and policy/procedure attributes of the setting in which learning occurs.
- Professional socialization; the contribution of the explicit and hidden curriculum, role models and context on the formation of a professional identity in physicians in training.
- Learner-centredness: the practice of prioritizing the needs and preferences of learners and/or the conscious effort to balance consideration of learner and patient needs in the clinical learning environment.
- Learning communities/communities of practice: communities that facilitate socialization and learning by providing learners with immersion in a professional context, cognitive safety and a community of peers and teachers.

Introduction



“Early studies of the medical school learning environment first highlighted the power and influence of the ‘hidden’ curriculum.”

This is the first edition of *A Practical Guide for Medical Teachers* that includes a chapter dedicated to the medical school learning environment (LE). Throughout the continuum of medical education, the environment that provides the context for learning is critical to how learners learn and what is learned. This impact may or may not be intended. The medical school LE is the first formal contact with the medical field for many students and begins their professional acculturation to the role of physician.

Growing focus on the environment as the context for learning has influenced research reports, policy perspectives and editorials. Proposals for reform of undergraduate medical education throughout most of the 20th century addressed curricula, expanding medical knowledge, workforce needs and improving learners’ clinical experiences. In contrast, for the past two decades, recommendations for medical education reform have increasingly focused on improving the LE. Recurrent themes are the unintended negative impact of the existing environment on learners, their professional development and wellbeing, and calls for medical education to occur in a learner-centred, supportive and humane environment.

The ideal LE places the learner at the centre of activities, as suggested in [Fig. 53.1](#). Around the learner are layers that collectively make up the LE, include social interactions within local microenvironments; the physical/architectural and technologic attributes of the LE, and the institutional meso environment of the individual medical school with the policies and procedures that govern learners’ engagement with teachers, curricula, assessment systems, patients and each other. At the outermost perimeter are national research interests and calls for reform of the medical school LE. The dimensions are dynamic and interact in their influence on students and their teachers. Because of these relationships, efforts to change any dimension of the learning environment may have both intended and unintended consequences.

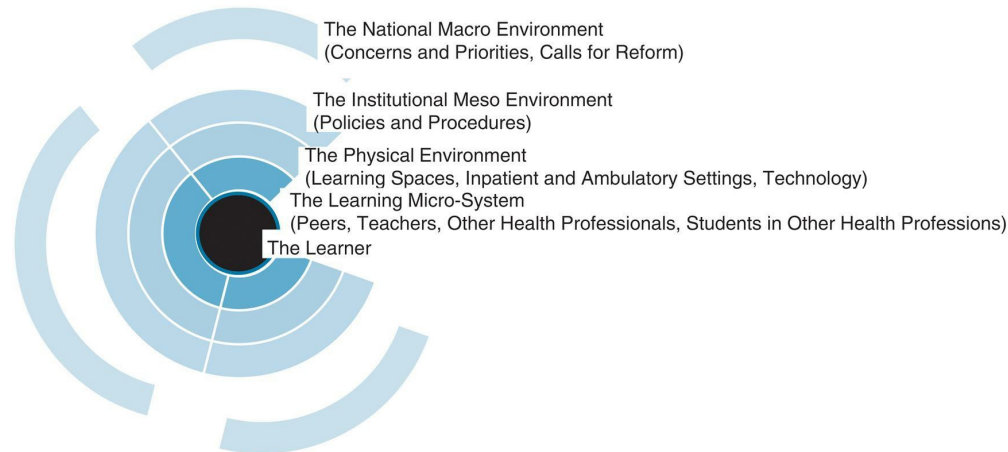


FIG. 53.1 Dimensions of a learner-centred learning environment.

In this chapter, we deconstruct these dimensions and address them individually to highlight what is known. We also offer practical guidance relevant to educators' and institutional leaders' efforts to have a positive impact on the LE. We encourage readers to draw connections between this chapter and critical elements of medical education discussed in other sections of the *Guide*. We close with discussing the LE of the future and a brief research agenda.

The first mentions of *LE* related to medical student education occurred in 1961, when a study described the impact of the environment on the 'class of 1960' and introduced the medical school environment inventory ([Hutchins, 1961](#)). Growing focus on the medical school LE over the next decades resulted from a growing awareness that stress and distress in students was not a sign of personal weakness but resulted from interaction with their environment ([Marshall, 1978](#)). Bibliometric data show the term LE rose in prominence in the literature from fewer than 10 articles in the peer-reviewed literature in the 1970s to 339 for 2019.

Critical to understanding the impact of the medical school setting as an agent of professional socialization is viewing the school as a community of practice. Newcomers join this community via a process of 'legitimate peripheral participation' — immersion in the new community and learning and integrating its modes of action and meaning as part of becoming a member ([Lave & Wenger, 1991](#)).

The preclinical learning environment

In most medical schools, clinical learning is preceded by preclinical education that allows students to learn foundational concepts from medical science and other relevant disciplines. The preclinical phase also begins students' socialization to the profession of medicine and is important to students' development of a professional identity (Holden et al., 2012) (Fig. 53.2).

| Elements of Learning | Teacher-Centred | Learner-Centred |
|---------------------------------------|---|--|
| Knowledge | Transmitted to lectures and instruction | Co-created by learners |
| Role of teacher | Lecturer, leader, authority | Facilitator and partner in learning |
| Learners' participation and enagement | Passive | Active |
| Emphasis | Memorization of concepts, providing "correct" answers | Developing a deeper understanding |
| Assessment | Testing of knowledge retention | Learning support, assessment for learning |
| Physical space | Lecture-oriented, speaker-focused | Shallow rooms, group settings, interaction-focused |
| Culture | Competitive | Collaborative, supportive |

FIG. 53.2 Teacher versus learner-centred education environments.

Medical schools have changed their learning approaches to be more learner-centred, using problem- and team-based learning. Learner-centred education changes fundamental principles of teaching and learning, as shown in Fig. 53.2. In a learner-centred environment, teachers draw on learners' experiences, thoughts and beliefs, encouraging them to bring their whole selves to educational interactions.

Learning communities are intentionally formed longitudinal groups that seek to maximize student learning and medical school experience – are one approach to learner-centredness (Smith et al., 2016). Students view them as a setting to form lasting collegial relationships, engage in cooperative learning, find mentoring, share the burden and stresses of medical education and become part of a professional community.

The clinical learning environment



"Learning in a clinical context is foundational in the training of health professionals; there is simply no alternative."

Nordquist et al. (2019)

The clinical phase of medical school is when learners first participate in patient care. This may occur early in medical school, as some schools have integrated their preclinical and clinical education, beginning with longitudinal experiences for students in the preclinical years. The clinical phase of education often is the first time students encounter illness and death on a personal level.

In contrast with the preclinical LE where the focus is on student education, learner-centredness becomes more challenging during the clinical phase of medical education. This is because of the coexistence of patients' needs and priorities of the clinical settings to be considered along with the needs of the learner. Because of its importance to student learning and professional development, the clinical learning environment (CLE) is a critical topic for educators, institutional leaders and accreditors ([Philibert et al., 2019](#)).

Attributes of the CLE with an unintended negative impact on learning includes 'actual' care settings that emphasize treatment over prevention, lack collaboration among health professionals, and are subject to productivity pressures, with little time for learner engagement and reflection. The influence of local culture and its ability to 'undo' the careful approach to professional socialization that characterizes the preclinical phase is shown in data suggesting a reduction in medical student idealism during the clinical phase of education. Some of this occurs as a necessary response to the burden of illness students are exposed to, whereas some is likely because of cynicism encountered from teachers, postgraduate trainees and more senior students. In a multi-institution study, the transition to clinical education was associated with a sizable reduction in students' perception of the educational attributes of the CLE ([Dunham et al., 2017](#)).

Students' experiences in clinical settings are critical to the development of the knowledge, skills and behaviours of a physician. This requires educators and leaders to balance the needs of patients, those of learners, and the constraints of most health systems. Students' experiences in the CLE also can highlight deficiencies in the formal curriculum, such as their need for added communication skills training to effectively participating in patient counselling and contributing to the provision of patient-centred care ([Box 53.1](#)).

Box 53.1

Optimizing clinical teaching and learning in the CLE

Optimize learner participation

- Provide clear learning objectives and expectations for learner engagement
- Connect the care of patients seen to the curriculum and learning objectives
- Allow time for reflection and debriefing
- Facilitate learners' active participation through supervision and feedback
- Plan which aspects of clinical care are ideal for engaging learners and what learning does not require the physical presence of the patient

Optimizing patient care

- Foster learner respect of the patients' privacy and dignity
- Brief patients about learners' roles and seek 'informed' consent for teaching
- When feasible, involve the patient in teaching
- Promote learner and teacher understanding of time pressures and maximize what can be accomplished

The physical and architectural environment

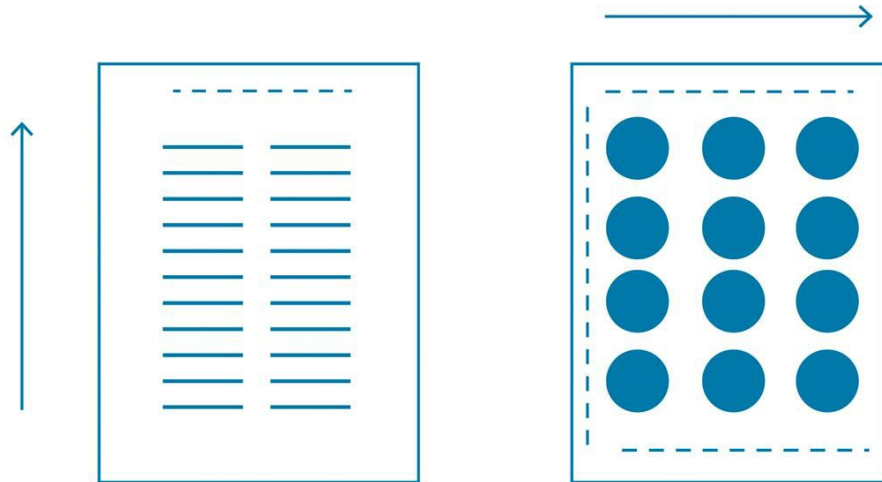
For the past five decades, medical education has seen innovation in curricula and learning approaches, including the move toward competency-based education. Yet only for the past 15 years has there been a realization of the importance of architecture and physical space to key dimensions of care and learning in healthcare settings (Nordquist & Laing, 2014).

Ideally, the design and construction of new learning spaces should explicitly take into consideration alignment of curricula and learning activities and the physical space, and interconnections to optimize the environment for clinical and learning functions. Examples include the redevelopment of the LE at the Karolinska Institute and its new university hospital, the new building of the Royal College of Surgeons of Ireland and the Duke University School of Medicine buildings in the United States and Singapore, among others.

While most educators will not have the opportunity to design new buildings or a major remodelling of space, there are easy yet effective ways to improve the physical LE, guided by a set of simple concepts that promote learner activation, increase emphasis on peer-to-peer learning and facilitate ready access to visual and digital learning resources. This requires physical spaces that allow: (1) visual contact and dialogue among participants; (2) visualization of participants' ideas and thought processes; and (3) small group settings for peer-to-peer learning (Nordquist et al., 2016).

Medical school leaders and teachers can redesign the physical space to fit with the emerging active curricula without being too specific; particular teaching methods do not have distinct specifications for the ideal physical setting. Instead, optimized space for active learning can be created using a few simple principles to 'reorient' classrooms and other learning spaces:

- Small round tables for six or nine allows for a peer dialogue at the tables, eye contact among participants and 'small group' session without a need for breakout rooms.
- Changing the room to a horizontal orientation reduces the distance between front and back rows. Chairs that swivel enable learners to turn and look at the speaker wherever he/she may be positioned in the room.
- Whiteboard space around the perimeter of the room and close to most small tables (Fig. 53.3) allows learners to work in small groups and to visualize their thinking.



Traditional Lecture-Centred Layout

Flexible Layout for Active Learning

FIG. 53.3 Reorienting learning spaces to maximize learner engagement.

In assessing the impact of the physical LE on professional socialization, it is helpful to use Goffman's distinction between frontstage and backstage ([Goffman, 1956](#)). Front stage includes official spaces for learning and performance, such as classrooms, lecture halls or spaces for patient encounters. Here the 'professional' side is displayed. Backstage encompasses corridors, meetings at the watercooler or the coffee lounge and other settings where informal conversations might take place and where the informal or 'hidden' curriculum often is communicated.

Efforts to improve the physical LE should also consider the identity of the space. The aim is to make the space inviting and unique, allowing the environment to meaningfully contribute to learners' experience, including the informal spaces where learners can meet outside class time and work, socialize and access digital resources. These informal spaces also serve as social nodes that can be conducive to learning as they facilitate serendipitous encounters. The term 'place-making' addresses the unique identity of a space ([Hawick et al., 2018](#)). The concept is used in modern coffee houses and other environments where the entire experience is a factor in customers' propensity to return. Giving a space an identity is not a matter of money, but of thinking about what makes an environment unique and helps create a positive experience.

The growing use of technology for learning also requires the creation of new or appropriation of existing space for informal digital learning. Designs similar to internet cafes can create a 'home' for these activities. Finally, the CLE needs smaller, private paces for reflection, debriefing and feedback.



"Creating an effective interprofessional education learning environment requires challenging assumptions about intellectual and physical 'turf.' This includes perceived power and status differentials among different health professions and among learners and teachers."

The physical learning environment is an important consideration in interprofessional education (IPE), which is critical to team team-based approaches in healthcare that require collaboration among professionals. IPE allows different health professions students to learn with, from and about each other, and is important for students' socialization to their professional roles. Whereas IPE curricula emphasize collaboration and teamwork, perceived differences in status and power may be expressed in actual interactions. The physical LE for IPE benefits from changing small 'dedicated' spaces to larger shared areas to reduce professional segregation and facilitate engagement. This is particularly important for informal spaces where interaction and socialization can occur.

Technology-enhanced, virtual and hybrid environments



"A challenge of technology in the learning environment is how to use it to enhance learning, while ensuring foundational medical knowledge and key concepts, such as communication skills and professionalism are adapted to, and are not compromised by, these new learning modalities."

Healthcare is increasingly moving towards technologic advances for patient care and health professions education. Digital learning has evolved with a proliferation of online tools, such as apps, blogs, podcasts and wikis. The formation of virtual learning communities, and assessment of learners has benefitted from technology that allows large amounts of data to be collected, analysed and aggregated into electronic portfolios. Open access journals and digital course materials have been particularly useful for teachers and learners in resource-constrained environments, and the growth in digital resources has resulted in online communities of practice around the globe. Although these advances benefit learners, teachers and patients, concerns remain about the management, safety, privacy and ownership of learner and patient data. [Coiera \(2004\)](#) noted that when people and technology interact, it creates a 'sociotechnical system.' He emphasized technical systems have social consequence and social systems have technical consequences, suggesting the use of technology in the LE needs to consider this interplay of humans and technology. This is relevant to the dynamic changes resulting from technology, including new conceptualizations of knowledge that include instantaneous access to vast repositories of information, and the continuous connectivity between machines and humans and among humans facilitated by technology. Technology that connects humans in the learning environment is particularly relevant, given the globalization of medical education and requirements for social distancing during a global pandemic.

Technology-facilitated approaches include virtual and hybrid environments that can be used collectively and designed to complement each other. An area of early adoption of technology-facilitated learning is anatomy education, which has been at the forefront of using technology to enhance students' learning experience. Selected examples of technology as a facilitator of learning are shown in [Box 53.2](#).

Box 53.2

Examples of technology-enhanced learning environments

- Online app platforms facilitate collaborative online classroom environments
- Interactive online course materials and tutorials that may have built-in formative

assessment

- Wikis and other media that facilitate the shared creation of course content with faculty monitors and curators, allowing students to collaborate on team-based learning activities
- Virtual LEs, including virtual reality environments
- Use of online systems to create classroom assignments and audience participation, with 'macros' used for automatic grading and instantaneous virtual feedback
- Use of blogging software for announcements, discussions, and online question/answer sessions
- Multimedia with ability to interact (e.g., messaging, commenting, correspondence)
- Blogs, podcasts and video environments

Diversity in the learning environment

Around the globe, medical students and their teachers are increasingly diverse, and diversity, equity and inclusion are much proclaimed aspirational goals in education programmes. This requires medical schools to create an environment that supports the learning and growth of a diverse group of students, and that allows for high expectations and risk-taking. Yet actual environments for preclinical and clinical education in many settings fall short of these expectations ([Razack & Philibert, 2019](#)).

The 'diversity' of a population encompasses the characteristics not shared by all members of a group, including race, ethnicity, graduation origin, sexual identity and orientation, and in self-identified attributes that place a learner in a seeming minority status, such as being the first in a family to attend university. Inclusion is defined as institutional practices and norms that promote a sense of belongingness of individuals, while recognizing and valuing individuals' uniqueness ([Shore et al., 2011](#)).

In the medical school LE, students may experience microinsults and microinvalidations by teachers, peers, patients and others based on race, ethnicity, nationality, gender identity, disability or another characteristic ([Sue et al., 2007](#)). A sense of belonging for diverse learners requires more than reducing confrontations and is fostered by attention to safety, including cognitive safety that allows diverse learners to express their views, and by acknowledging that recognition of a person's uniqueness may require changes in practice to accommodate diverse individuals ([Razack & Philibert, 2019](#)).



Tip

Microaggressions are brief and commonplace verbal, behavioural and environmental indignities that communicate hostile, derogatory or negative racial slights and insults. They often have harmful or unpleasant psychologic impact on the target individual or group.

Microinsults are intentional behaviours, actions or verbal remarks that convey rudeness, insensitivity or demean an individual's or group's social identity or heritage.

Microinvalidations are actions that exclude, negate or nullify the thoughts, feelings or experiential reality of individuals who represent different groups.

(From Sue et al., 2007)

The diversity of learners and teachers changes the LE, with opportunities for skills, such as respect and cross-cultural understanding to be modelled, taught, prompted, and reinforced by teachers. Inclusiveness in the medical school LE requires a multi-part approach that allows for the co-creation of the LE. Effective dialogue requires a commitment to addressing concerns in ways that privilege the voices of vulnerable groups, including learners, and recognize that some concerns may not be raised because

of fear of reprisal. See [Box 53.3](#) for strategies to promote inclusion in the LE.

Box 53.3

Promoting inclusion in the learning environment

- Diversity is a fundamental property of populations, not a ‘problem’ to be fixed
- Understand and apply the science of engagement and empowerment in the workplace, and use it to improve the LE for students and their teachers
- Ensure an equitable and inclusive environment for all learners, teachers, supervisors and staff, regardless of race, ethnicity, graduation origin, gender or sexual orientation
- Inclusive practices include recognizing uniqueness and promoting belongingness
- Acknowledge that inclusive practices entail a combination of acknowledging, accommodating and appreciating differences among individuals, and that inclusion is an ongoing process, not a finite goal that can be achieved and abandoned
- Equity seeks to address ongoing injustices experienced by marginalized persons
- Beware of nostalgia, neutrality and conflating approaches and outcomes in inclusion discussions

Modified from Razack & Philibert (2019).

Potential pitfalls in efforts to promote inclusion in the LE encompass nostalgic reference to ‘the past,’ teachers’ ‘neutrality’ on diversity not explicitly rooted in institutional values, and a failure to recognize and act on ethical obligations to all learners, including members of minorities ([Razack & Philibert, 2019](#)). Another problem relates to the failure in curricula and conversations to connect diversity with core concepts of equity, critical consciousness and social justice. An acknowledged challenge is how to prepare teachers with little experience or expertise to effectively teach these complex and challenging concepts and engage learners in discussions.

Creating a safe and supportive learning environment



"An important concept for students' clinical experiences is 'cognitive safety' in recognition that learners will make errors and need assurance processes are in place to protect them and their patients."

On matriculation to medical school individuals who were the 'best' in their prior cohorts are now in a group with equally bright and high-achieving individuals. This change and the challenges of the medical curriculum create a sense of isolation for many students. LE-related sources of stress and distress in learners include availability of teachers and mentors, harassment and belittlement by teachers and peers, moral distress, the climate of local CLEs, lack of work-life integration (support for personal life events, medical/family leave), financial stress, patient complexity, death and dying, and high-stakes assessments and graduation and licensure requirements ([Dyrbye et al., 2020](#)).

The process of becoming a physician is challenging, and students need a safe and supportive environment for their intellectual growth and professional development. The importance of a supportive medical school LE for student wellbeing and learning has been recognized by the Liaison Committee on Medical Education (LCME), the North American medical school accrediting body for medical schools ([LCME, 2020](#)). How the medical school LE assists students in dealing with the emotional burdens of becoming a physician, and how it supports learners through orientation, mentoring, counselling and medical and mental health services are critical to their wellbeing. In the CLE, support for learners should include biosafety (knowledge, techniques and equipment to prevent personal, laboratory and environmental exposure to potentially infectious agents or biohazards), adequate supervision and attention to the quality of care in settings where learners participate in care and gain clinical skills ([LCME, 2020](#)). Ensuring learner safety and wellbeing may require changes in aspects of the LE. Selected practical recommendations for redesign of the LE to promote learner and teacher wellbeing include:

- Empowering and equipping teachers by promoting their own wellbeing
- Ensuring learner workload is manageable and conducive to learning
- Addressing workflow and electronic health record systems
- Fostering social relationships and meaningful human connections
- Pass-fail grading schemes for the preclinical phase of education
- Educating learners and teachers about self-care behaviours ([Dyrbye et al., 2020](#))

Evaluating and improving the learning environment

The medical school environment is characterized by strengths and areas for improvement, and leaders and educators are responsible for regular evaluation of the LE to identify strengths and act on areas for improvement. The World Federation for Medical international standards for medical education contain requirements for the learning environment ([WFME, 2015](#)) and the LCME requires schools to regularly evaluate their LE ([LCME, 2020](#)). Most medical school accreditors require a comprehensive self-examination of the school that includes evaluation of its learning environment, with input from students and faculty, and for schools to have short- and long-range plans to guide LE improvement efforts.

A powerful tool for improving the LE is information from surveys and reports by students and ensuring anonymity in students' evaluation of their learning experience is critical. Efforts benefit from the use of validated tools. The constructs assessed have remained remarkably constant, with the 1961 Medical School Environment Inventory encompassing six factors that remain relevant to current assessments of the LE: general esteem, academic enthusiasm, breadth of interest, extrinsic motivation, intrinsic motivation and encapsulated training ([Hutchins, 1961](#)).

The Dundee Ready Education Environment Measure (DREEM) has the broadest validation for assessing the medical school LE in cross-national settings. It addresses five domains of student perceptions: learning, teachers, academic self-perceptions; the atmosphere of the school, and students' social self-perceptions. The DREEM has been translated into eight languages, with more than 40 publications ([Mile et al., 2012](#)) and another articles 139 published between 2013 and 2019. The communication, curriculum, and culture (C3) instrument measures the patient-centredness of the medical school CLE, including support for students' patient-centred behaviours ([Haidet et al., 2006](#)), with some use in international settings. A brief version for the preclinical phase of medical education collects data on learners' observations about patients being viewed as objects, learning relationships, talking respectfully about colleagues and support for students' patient-centred behaviours ([Rdesinski et al., 2015](#)).

The learning environment of the future

The medical school LE is characterized by change, including growth in scientific knowledge and the proliferation of technology. New roles for medical schools include an expanded mission that frequently encompasses research and a growing clinical enterprise. Healthcare delivery in the future will be informed through technology, big data and analysis capabilities that will accelerate the existing blurring between healthcare and services provided by other segments of the economy, including genome-based tests, home-based sensors and wearable biotechnology tools for diagnosis, health monitoring and provision of care. This has profound effects on the knowledge and skills needed by physicians and on the LE in which they acquire these skills.

These developments require medical schools, educators and accreditors to generate a research agenda to better understand the learning environment of the future. This research will build on a robust base of prior studies that collectively demonstrate that attributes of the LE influence student learning, professional development and perceptions of safety and inclusion. Future work should deepen the community's understanding of these influences, with educators, researchers, institutions, professional groups and students contributing to the development of the research agenda.

Studies are also needed to revalidate existing and develop new instruments for evaluating the medical school LE around the globe, as some existing instruments developed in North America or Europe may not be readily 'exportable' to international settings. Research to optimize the LE may ultimately contribute to making the environment an active curricular component that enhances learning, in lieu of a construct with potentially negative effects that need to be mitigated.

Summary

The medical school phase of the medical education continuum begins the process of acculturation to the profession and life-long learning and professional development. This suggests a need to focus on attributes of the LE and how they influence and are perceived by learners. These studies will help the community to better understand and improve the medical school LE. Practical strategies for the present time include helping medical students understand the concept of the learning environment and how it shapes their thinking and values, including their professional development and their perceptions of self-worth.

References

- Coiera, 2004 Coiera E. Four rules for the reinvention of health care. *British Medical Journal*. 2004;328:1197–1199.
- Dunham et al., 2017 Dunham L, Dekhtyar M, Gruener G, et al. Medical student perceptions of the learning environment in medical school change as students transition to clinical training in undergraduate medical school. *Teaching and Learning in Medicine*. 2017;29(4):383–391.
- Dyrbye et al., 2020 Dyrbye LN, Lipscomb W, Thibault G. Redesigning the learning environment to promote learner well-being and professional development. *Academic Medicine*. 2020;95(5):674–678.
- Goffman, 1956 Goffman E. *The presentation of self in everyday life* New York: Doubleday; 1956.
- Haidet et al., 2006 Haidet P, Kelly PA, Bentley S, et al. Communication, curriculum, and culture study group Not the same everywhere Patient-centered learning environments at nine medical schools. *Journal of General Internal Medicine*. 2006;21(5):405–409.
- Hawick et al., 2018 Hawick L, Cleland J, Kitto S. “I feel like I sleep here”: how space and place influence medical student experiences. *Medical Education*. 2018;52(10):1016–1027.
- Holden et al., 2012 Holden M, Buck E, Clark M, et al. Professional identity formation in medical education: the convergence of multiple domains. *Healthcare Ethics Committee Forum*. 2012;24(4):245–255.
- Hutchins, 1961 Hutchins EB. The 1960 medical school graduate: his perception of his faculty, peers, and environment. *Journal of Medical Education*. 1961;36:322–329.
- Lave and Wenger, 1991 Lave J, Wenger E. *Situated learning: legitimate peripheral participation* Cambridge: Cambridge University Press; 1991.
- LCME, 2020 LCME® *Functions and Structure of a Medical School* Standards for Accreditation of Medical Education Programs Leading to the MD Degree, 2021–2022. March 2020. <https://lcme.org/publications/>, accessed November 19, 2020.
- Marshall, 1978 Marshall RE. Measuring the medical school learning environment. *Journal of Medical Education*. 1978;53(2):98–104.
- Miles et al., 2012 Miles S, Swift L, Leinster SJ. The Dundee Ready Education Environment Measure (DREEM): a review of its adoption and use. *Medical Teacher*. 2012;34(9):e620–e634.
- Nordquist et al., 2019 Nordquist J, Hall J, Caverzagie K, et al. The clinical

- learning environment. *Medical Teacher*. 2019;41(4):366–372.
- [Nordquist and Laing, 2014](#) Nordquist J, Laing A. Spaces for learning – a neglected area in curriculum change and strategic educational leadership. *Medical Teacher*. 2014;36(7):555–556.
- [Nordquist et al., 2016](#) Nordquist J, Sundberg K, Laing A. Aligning physical learning spaces with the curriculum AMEE Guide No 107. *Medical Teacher*. 2016;38(8):755–768.
- [Philibert et al., 2019](#) Philibert I, Elsey E, Fleming S, Razack S. Learning and professional acculturation through work: examining the clinical learning environment through the sociocultural lens. *Medical Teacher*. 2019;41(4):398–402.
- Razack and Philibert, 2019 Razack S, Philibert I. Inclusion in the clinical learning environment: building the conditions for diverse human flourishing. *Medical Teacher*. 2019;41(4):380–384.
- [Rdesinski et al., 2015](#) Rdesinski RE, Chappelle KG, Elliot DL, et al. Development and use of an instrument adapted to assess the clinical skills learning environment in the pre-clinical years. *Medical Science Education*. 2015;25(3):285–291.
- [Shore et al., 2011](#) Shore L, Randel A, Chung B, et al. Inclusion and diversity in work groups: a review and model for future research. *Journal of Management*. 2011;37(4):1262–1289.
- [Smith et al., 2016](#) Smith SD, Dunham L, Dekhtyar M, et al. Medical student perceptions of the learning environment: learning communities are associated with a more positive learning environment in a multi-institutional medical school study. *Academic Medicine*. 2016;91(9):1263–1269.
- Sue et al., 2007 Sue DW, Capodilupo CM, Torino GC, et al. Racial microaggressions in everyday life. *American Psychologist*. 2007;62(4):271–286.
- [World Federation for Medical Education \(WFME\), 2015](#) World Federation for Medical Education (WFME). *Basic medical education WFME global standards 2015* Copenhagen, Denmark: WFME Office. Ferney-Voltaire, France; 2015.

Medical Education Research

Jennifer A Cleland and Steven J Durning

Trends

- Health professions education research seeks ways to improve education such that the graduate is better prepared to help patients.
- Research in health professions education often draws on the theories, study designs, methods and analytic techniques of other more established disciplines.
- Select your research paradigm – qualitative and quantitative research differ on several key aspects. Qualitative and mixed methods research is growing in health professions education.
- Use of theory is key to studying our complex environments.
- Grant funding opportunities are growing yet are still not on par with biomedical sciences.

Key concepts

- Medical education research: research which focuses on ways to improve education such that medical students and doctors are better prepared to help patients and deliver healthcare.
- Worldview: how you understand the world and what goes on around you.
- Design: a framework for the set of methods and procedures used to collect and analyse data on a research question.
- Methodology: the procedures of inquiry.
- Methods: the specific procedures or techniques used to identify, select, process, and analyse information.

Introduction

Research in the health professions is critical to the future of education and patient care. However, more people die in a given year as a result of medical errors than from motor vehicle accidents, breast cancer, or acquired immunodeficiency syndrome (AIDS) ([Donaldson et al., 2000](#)). In other words, health professions education, advanced as it is, does not, for example, directly link education and safe care. Here is where health professions education research comes in. While biomedical research seeks ways to improve treatments that help patients, health professions education research seeks ways to improve education such that the graduate is better prepared to help patients. By encouraging thinking, discovery, evaluation, innovation, teaching, learning and improvement via research, the gaps between best practice and what actually happens can be optimally addressed. Ideally, research should inform and advance education and practice, while education and practice should inform and advance future research. More specifically, health professions education research is grounded in the real world of education practice. This is analogous to applied clinical research, where research yields actionable knowledge.

It is helpful to illustrate what we mean with relevant examples. The field of assessment is a good illustration of how health professions education research has informed health professions education. Assessment has changed dramatically in just a few decades, from a reliance on essays and long cases to understanding, and widespread adoption of more reliable and valid measures, such as the Mini-clinical evaluation exercise (Mini-CEX) and the Objective Structured Clinical Examination (OSCE). Both of these assessment methods have the benefit of much research to ensure not just their psychometric properties but also their relevance to particular health professions settings and stages of training (e.g., undergraduate versus postgraduate). Secondly, some excellent examples of how education research has impacted patient care come from the field of research into expert performance. This approach focuses on measuring performance on clinical tasks to isolate features of expert performance, to identify the mechanisms which underpin these, and then use this information to create educational environments that facilitate its acquisition. Expert performance, and its components of deliberate practice and mastery learning, have been very well researched, and found to lead to improved and safer care practices, and better patient outcomes (for further explanation of these concepts and an overview of research in the area, see [McGaghie & Kristopaitis, 2015](#)).

Although we use assessment and expert performance as examples of good research which informs both education practice and patient care, note that these are not 'out-of-date' areas of research—far from it. There is much we still need to know about both processes. There are emerging research streams looking at how learners interpret and value the information/feedback they receive through assessment, and what factors influence this (e.g., [Bing-You et al., 2018](#); [Scarff et al., 2019](#)). There is growing research using neuroimaging (e.g., functional magnetic resonance imaging [fMRI]) to view the neuroanatomic activation changes that occur during thinking, which could lead to

future assessment strategies that enable more direct exploration of thought processes (e.g., [Durning et al., 2014](#)). Thus as ongoing research continues to advance knowledge and practice in established areas of interest, new fields of enquiry also open up.

This last example illustrates how, if one delves into assessment and expert performance, one sees that research and practice in these approaches draw from other fields of knowledge, from broader educational, sociologic, cognitive, biomedical and psychologic literatures. Why is this the case? Health professions education research is the birthplace of many innovations that one now finds in other domains as well; the use of simulated patients; simulation in general; the OSCE; longitudinal ‘progress testing;’ small-group tutorial learning, such as problem-based learning, and so on. The research approaches used to investigate these innovations have drawn heavily on the theories, study designs, data collection and analysis approaches from other more established disciplines. To do so makes sense—why reinvent the wheel? Indeed, many of the problems and questions that need to be explored are not unique to any one area. Some require the bringing together of resources and knowledge from different fields and disciplines to understand and perhaps even solve complex, real-life problems. We expand on this point later in the chapter.



Tip

Research in health professions education often draws on theories, study designs, data collection and analysis approaches from fields outside of medicine.

Like many relatively ‘young’ areas of research, the early years of health professions education research were characterized by studies drawing on the scientific tradition and without an obvious philosophic or theory base. This is illustrated well by looking chronologically at research in any one field of health professions education. This is evident in relation to assessment and selection, for example. Early studies focused typically on correlation of measures from convenience samples from single institutions and addressed limited view of validity evidence (e.g., predictive validity), whereas more recent work entails more comprehensive frameworks with specific theoretical underpinnings and reporting of results (e.g., [Schreurs et al., 2019](#)). Another example is that of clinical communication skills. In this area, papers published in the 1980s tended to be descriptive, sharing with readers how one institution taught communication skills to medical students, usually in a preclinical context, and perhaps describing outcomes in the form of student acceptability and satisfaction with the course. Our brief historical review of this literature indicated that studies in this area have progressed notably over time, first towards examining if particular ways of teaching made an impact on performance on examination, but then towards more nuanced explorations of the social, emotional and contextual variables which might influence not just student performance but also assessor behaviour in communication skills teaching and assessment, with the most recent studies providing possible theoretical reasons to help frame their study

findings (e.g., [Ginsburg et al., 2015](#)).

Quantitative and qualitative research

As the field has matured, the importance of being explicit about the philosophy behind a piece of work is reflected in the reporting of studies. How this is done is fundamentally different between quantitative and qualitative research. The differences between these two approaches are not just about how data is collected (e.g., the randomized controlled trial [RCT] versus the exploratory interview) but rather about very different assumptions of the world (ontology) and how science should be conducted (epistemology). Research philosophies differ on the goals of the research and the way to achieve these goals (Cleland, 2015). For example, is the purpose to test theories and discover general principles, or is it to describe and explain complex situations?

Quantitative research assumes knowledge is observable and measurable, and hence the method, approaches and procedures of the natural sciences can be used for the study of individual and objective findings (e.g., knowledge acquisition from this view as an object in memory). Research questions (hypotheses) are often in the form of an if/then statement; for example, if we teach handwashing, then infection rates will reduce.

Many people carrying out health professions education research are from scientific backgrounds, such as medicine or biomedical sciences. Their training is in the scientific method, of proving or disproving hypotheses and controlling for confounding variables. This approach is what they are inherently comfortable with, and it can work very well in some areas of health professions research (e.g., the area of expert performance given as an example earlier). However, it is just not appropriate for other areas of study, specifically when the research question is concerned with more social or cultural factors. Examples of this would include how students or trainees experience a particular clinical learning environment, placement, situation or role, and how these experiences may impact on their learning and personal development. This is where qualitative research with its premise of subjectivity is appropriate. In qualitative research, reality is relative and multiple, perceived through socially constructed and subjective interpretations. Research questions are much more open and exploratory (e.g., our aim was to explore the nature of interactions between resident and attending).



Tip

Research approaches often fall into two broad camps: quantitative and qualitative. These approaches differ in terms of their philosophies, designs, methods and analysis techniques.

These different 'worldviews' (e.g., McMillan, 2015) and questions mean different designs, methods and data analysis approaches are required in research. There are four

broad approaches to study design within quantitative research: descriptive, correlational, quasi-experimental and experimental. The main qualitative research designs are ethnographic, narrative, phenomenological, grounded theory and case study. Each of these designs come with expectations as to data collection and analysis methods (Cleland, 2015).

It is critical that each step in the process aligns; using a quantitative approach (such as a randomized controlled trial) to answer an exploratory question is incorrect, as typically would be using a qualitative approach to test a hypothesis. In terms of methodologic planning and reporting, it would be very appropriate to look for a power calculation when evaluating a funding proposal or reviewing a paper for publication which involves an RCT in health professions education. This would not be the case in a qualitative interview study where it is usual to give an approximation of how many participants will be required (e.g., 12–18 people) and why this number is sufficient. In both cases, a description of the sample is equally important, so the readers know the population/participants are appropriate to the research question, but how these are planned and reported differs greatly.



Tip

It is critical to select the right research philosophy, design, methods and analysis approach for the right question, and to align these components of the research process appropriately.

Both quantitative and qualitative research should have a logical chain of reasoning behind their choice of study design, methods, tools and analytical approaches. This allows researchers to rule out rival hypotheses and explanations with convincing arguments and solid data, and for the research outcomes to be judged on explicit quality criteria (Holmberg et al., 1999; Lincoln & Guba, 1985).



Tip

Different types of research are judged differently in terms of their quality and rigour. Being aware of the different criteria can help you plan good quality research.

Table 54.1, reproduced from Cleland et al. (2018), gives a useful overview of the assumptions, purpose and approach of quantitative and qualitative research philosophies and designs.

Table 54.1 Key characteristics of quantitative and qualitative research (reproduced with permission)

| |
|--|
| |
|--|

| | Quantitative | Qualitative |
|-----------------|---|---|
| Assumptions | Positivism/postpositivism | Constructivism/interpretivism |
| | Social phenomena and events have an objective reality | Reality is socially constructive |
| | Variables can be identified and measured | Variables are complex and intertwined |
| | The researcher is objective and outside the research | The researcher is part of the process |
| Purpose | Generalizability | Contextualization |
| | Prediction | Interpretation |
| | Explanation | Understanding |
| Approach | Hypothesis testing | Hypothesis generation |
| | Deductive, confirmatory, inferential: from theory to data | Inductive and explanatory: from data to theory |
| | Manipulation and control of variables | Emergence and portrayal of data |
| | Samples represent the whole population so results so results can be generalized | The focus of interest is the sample (uniqueness) |
| | Data are numerical or transformed into numbers | Data are words or language: minimal use of numbers |
| | Counting/reductionist | Probing/holistic |
| | Statistical analysis | Analysis draws out patterns and meaning |
| Designs | Descriptive | Ethnographic |
| | Correlational | Narrative |
| | Quasi-experimental | Phenomenological |
| | Experimental | Grounded theory |
| | | Case study |
| Data collection | Numerical data collected via: | Words or images collected via: |
| | <ul style="list-style-type: none"> – Structured observation/checklist – Questionnaires – Measurements – Rating scales | <ul style="list-style-type: none"> – Observations – Interviews/focus groups – Reviewing documents or visual material – Diaries/drawings |

From [Cleland, 2015](#).

The use of theory

A major difference between quantitative and qualitative healthcare education research is in its use of theory and/or conceptual frameworks (Cleland, 2015). In quantitative research, theory is often seen as something from which to derive a hypothesis, a tentative explanation that accounts for a set of facts and can be tested by further investigation. The use of theory is often more explicit in the qualitative tradition. Here, it typically has the purpose of providing a framework or lens to organize and interpret the data in such a way as to highlight commonalities and patterns and generate conceptual generalizability (Bordage, 2009). These can then be assessed by others for their transferability and potential for applicability to other situations (Lincoln & Guba, 1985). There are debates in the wider literature as to whether theory is a product (in other words, where the aim of the research is to develop or refine a theory, to test it out in some way) or a tool (something which helps explain what we are researching or our findings). For most of us, it will be the latter—using theory as a tool to draw ideas together, to make links and offer explanations (Bourdieu & Wacquant, 1992). The following example shows how theory was used in practice in one of Cleland's programmes of research.

One of Cleland's areas of research interest is selection and widening access to medicine. Widening access refers to policies and practices designed to ensure that no group of individuals are disadvantaged or face barriers into professions, such as a medicine. This is linked to diversifying the medical student body on the basis of social class, ethnicity, gender and other demographic characteristics (the particular issues tend to vary by country). Widening access to medical education is the focus of much political rhetoric, national and local activities across the developed world. However, the statistics indicate that, despite much investment, in the United Kingdom at least, nothing has changed for those from lower socioeconomic groups who remain underrepresented in medicine (selection is equally topical, both in terms of 'fairness' to those from certain groups, but also in terms of measurable factors, such as the predictive validity of different approaches to selection). National statistics indicated that the impact of much policy and investment for widening access to medicine has differed by subgroup: the issue of widening participation (WP) in terms of social economic background, status or 'class' remains an issue in the United Kingdom. What became clear during a study where we interviewed all the UK Medical Admissions Deans is that individual medical schools interpret and put WP policy into practice very differently (Cleland et al., 2015). Through our knowledge of the education literature and an openness to considering education theory, we identified the concept of policy enactment which helped explain how putting macro-level WP policy into micro-level (local) practice was a complex, interpretative process. This provided a more nuanced account of the processes of WP within medical schools that had been previously available. Thus the use of a theory from education clarified a complex phenomenon. It also facilitated a cumulative programme of research where we were able to gain funding to explore WP in much more detail, to make recommendations for policy and

practice change.

Recent work in medicine has focused on better understanding of what underpins good clinical care and what may lead to error as discussed in the introduction to this chapter. One area that has recently been explored with diagnostic error is mental effort and its impact on clinical performance. Cognitive load theory (e.g., [Van Merriënboer & Sweller, 2010](#)) has been used to look at the relationship between mental effort, learning and performance. It argues that we can only hold or place a limited number of pieces of information in our short term or working memory and when this capacity is exceeded, error can result. Investigations have explored relating self-assessment measures of cognitive load with performance, as well as biologic proxies of cognitive load with performance. This emerging field is demonstrating that biology (e.g., heart rate variability [[Solhjoo et al., 2019](#)] or pupillary size) may be more accurate in determining mental effort or load than self-ratings. Thus through the use of this theory, the complex phenomena of mental effort and its relationship to performance is now being actively explored.

In summary, theory can help to identify the appropriate study question and target group, clarify methods, provide more details and informative descriptions of the intervention or phenomena, uncover unconsidered effects, and assist in analysis and interpretation of results. Theory from other fields can support the development of healthcare professions research and extend knowledge.



Tip

Theory strengthens the practice and interpretation of research.

These examples illustrate how useful it is to learn from other fields where there is cross-fertilization, then consider how best to combine knowledge from these fields, to guide and enrich what we do, opening our minds to different ways of thinking and working. As further examples, consider using biologic measures from heart rate variability combined with validated surveys (from cognitive psychology and education) to better understand mental effort (cognitive load) or use of fMRI scanning with validated multiple-choice questions to assess clinical reasoning. By being open to the use of different theories and approaches in this way, and in time, it is likely that health professions education research will develop its own novel theories and approaches, which other disciplines may, in turn, borrow and adapt.



Tip

Being open to the use of different theories and approaches can be exciting and informative.

One point of caution. Whatever be your question and natural inclination towards particular schools of theory, consider different theories and methods carefully. Do not jump too quickly, consciously or not, onto a single option without exploring others. The time spent in reflecting on which theory and methods are appropriate for your purposes early in the research process is time well spent—and can be fun to discuss and debate with your collaborators and coauthors. For example, we have both benefited from working with colleagues with different backgrounds from our own, who introduced us to theories and perspectives common in their disciplines, but quite new and novel to us. Exploring and discussing these in terms of their potential relevance to the proposed studies was stimulating and thought-provoking and opened our eyes to new ways of thinking and working. Some questions to ask when considering theory from other fields are: Do the concepts of the theory resonate with healthcare professions education research? How developed is the theory (e.g., How much have its propositions been tested?). Are the theory's assumptions, concepts/constructs, and propositions congruent with the assumptions of your study?

Mixed methods research

Many people take the pragmatic stance of a mixed-methods approach—where a programme of work may encompass quantitative and qualitative designs, methods and data collection. This can be very useful in terms of answering research questions, but it is important to be clear about the relationships between different approaches within a programme. As stated earlier, one of Cleland's education research themes is selection and widening access to medicine. The projects within this theme vary from quantitative studies examining patterns in 'big' national data sets to small qualitative projects, which use education and linguistic theories to give insight into the complex topics of selection and widening access. Cleland and colleagues used Bourdieu's concept of reflexive sociology as the theoretical basis for this mixed methods programme of research ([Bourdieu, 1990](#)). This approach allowed them to reflect on the differences between qualitative and quantitative approaches. The objective database studies provided the picture of what was going on in terms of objective patterns or class, gender, ethnicity and attainment in relation to medical application and selection. At the same time, the qualitative studies provided insight into how different groups of applicants and medical students act, which in turn produces and reproduces the social phenomena of limited social (class) diversity in medical education and training in the United Kingdom. In this way, they articulated how and why they integrated quantitative and qualitative methods in their programme. This approach may seem a tad esoteric but these are the kind of things which help in terms of planning, justifying and reporting mixed-methods approaches.



Tip

If using mixed-methods research, be clear about the relationships between different approaches within the research programme.

If the mixed-methods approach seems appropriate for your research, [Cresswell and Plano Clark \(2010\)](#) provide an excellent guide.

Reflection

It is important to consider how your preconceptions about the world might influence your research. As mentioned earlier, you may have been trained in an objective, quantitative approach and thus feel more comfortable working in that way. Equally, you may be a social scientist working in health professions education research, and be less than enthusiastic about quantitative approaches as your own training leads you to consider the world as social and subjective. Both stances are valid, but it is important to actually reflect on assumptions about knowledge and reality, and to consider what worldview would provide the most suitable lens and tools for understanding the particular health professions education issue under investigation.

If you are working with a qualitative research paradigm, it is also critical to reflect on your role in the data collection and interpretation process ([McMillan, 2015](#)). In qualitative research, the specific ideas and beliefs predominant in the society and groups to which the investigator belongs will affect or even determine what she or he discovers and concludes. As an example, JC's views on data as a psychologist and woman living and working in the United Kingdom may be very different to SJD's views as a medical doctor and man living and working in the United States.



Tip

Consider how your preconceptions about the world might influence your research in terms of your assumptions and preferred methods.

There are recommended techniques for reflecting on one's position in the research process ([Lincoln & Guba, 1985](#)). Reflexivity is one way of doing so. This involves thoughtful analysis self-reflection of assumptions, and a continuous checking that these assumptions are aligned with and appropriate for the research situation, the research question, and the methodologies and methods adopted. There are various ways of doing this. An audit trail, tracking decisions made during the research process, is useful, particularly if this also contains notes on the thinking processes, which were integral to the study design and its implementation and subsequent analysis and reporting (see [McMillan, 2015](#); for a full discussion of reflexivity, or 'worldview'). By being reflexive, you consider issues, such as why one approach rather than another (because it was not appropriate rather than because you did not know how to conduct a particular approach), and ensure that your enquiry was conducted well, and without unacknowledged assumptions or preconceptions. You may well use reflection in your clinical practice, and so have the necessary skills to transfer to your research work.

Building capacity

For many people, education research is part of a portfolio of activities which include clinical service, teaching, administration and research; possibly clinical, as well as education research. There are few people who have the luxury of focusing on only one of the aforementioned on a week-to-week basis. Given this, it is important to be realistic about what you can achieve by focusing on one topic or theme. If you can develop a programme of research, or a research theme (e.g., work-place based assessment, selection, deliberate practice, or focused topics within these broad areas), you are more likely to produce a series of studies which flow logically from one to another—the questions raised by one study decide the focus of the next, and so on. This approach to (clinical or education) research increases your chances of success in terms of publication and grants (see later), and in terms of developing a team of collaborators with whom you have common interests.

If setting out on this journey, the first step is to look at the literature for evidence on your topic of interest. It may be that your original research question has already been answered, but equally your review is likely to identify other questions and avenues for future research. Indeed, it is commonplace for academic papers to finish with a section outlining directions for future research, policy and practice. Do the unanswered research questions fit with your interests, knowledge and skills? Are there people who would willingly work with you to answer these questions? Is this something that would be useful locally (in which case you may find your colleagues are more supportive of your ideas)?



Tip

Do not neglect the basics. Always do a literature review in the early stages of planning your research.

These are all questions to ask oneself and it is also important to recall where we started in this chapter. There is a shift away from researching how do we do x at y institution, or in such-and-such a context, towards bigger picture studies, including regional, national and international studies and collaborations. This might seem too ambitious if you are new to health professions education research. Consider then a pilot quantitative study or a context-dependent qualitative study which is positioned beyond the local.



Tip

Think: “Who else will be interested in this?” But at the same time do not underestimate the importance of demonstrating the value of your work to local institutional practice.

Our own experiences have also taught us the importance of acknowledging our own limits. We all have our areas of expertise; no one is an expert in everything. Working with others opens the mind to other ways of thinking, different theories, different ways of seeing the same problem, and different methodologic and analytic tools. We could not do what we do without colleagues from medical statistics, health economics, sociology, linguistics and psychology. The research is so much the better as group effort. But to build this group, we have had to network in our own institutions as well as externally; to pursue casual chats by email to firm up ideas and potential alliances. Some potential collaborations have not materialized, for whatever reason (people are busy and/or do not have common interests), but where they have worked, all involved have gained.



Tip

Being focused in terms of a theme or topic and collaborating appropriately to ensure a wide skills set in the research team will increase your chances of success.

Related to this, many of the problems and questions that need to be explored are not unique to any one area. Some require the bringing together of resources and knowledge from different fields and disciplines to understand and perhaps even solve complex, real-life problems. It is important to stress the need for interdisciplinary in addition to multidisciplinary research. In the latter, research problems are investigated from different disciplines, whereas in the former, theories, insights and methods from different disciplines are integrated to investigate a jointly defined problem. Interdisciplinary collaboration has the potential to forge new research fields. Collaboration of this type is, however, not always easy – different disciplines have different assumptions, language, methods and viewpoints, as well as different journals, publication norms and standards. On a practical note, funders often like – and look for – multidisciplinary collaborations. Indeed, the right team is a core attribute of a successful grant application.

Funding

Finding grant funding for health professions education can be challenging. However, although limited, opportunities are growing. The Association for Medical Education Europe (AMEE) offers research grants and grants to support research in emerging regions. There is funding through the medical education meeting sponsored by the AAMC in the United States, through the Scottish Medical Education Research Consortium (SMERC) in the United Kingdom, through the medical education national association in The Netherlands, and equivalent funding in many other countries.

Critical to the success of any grant project includes having a team, being adaptable (e.g., where one searches/considers for funding), and speaking with (and following) grant guidelines of the funder—in addition to demonstrating clarity of one's ideas and rigor in the approach to planned research.

Given that opportunities are limited, one needs to be both creative about where to send ideas as well as resilient if one receives a rejection. Our experience is that health professions education grant funding typically requires multiple attempts, but feedback from unsuccessful bids can be extremely useful in terms of improving later applications. For additional reading, we would recommend the reader reviews the recent AMEE Guide on Grant Funding ([Blanco et al., 2016](#)).



Tip

Successfully obtaining grant funding requires building a strong proposal and team, then patience, resilience with the process and creativity.

Summary

In this short chapter, we cannot give readers more than a flavour of the basic building blocks of research. However, the references give a broad introduction to health professions education research and introduce how to use a theory to underpin research, as well as providing examples and illustrations of a diversity of methods and their use. We hope that this chapter stimulates fresh thinking and new ideas for educational research in medical and health professions and encourages you to engage further with the many exciting theories, models, methodologies and analysis approaches available, the use of which will progress our field of study. If so, we refer you to the textbook *Researching Medical Education*, for a good introductory text ([Cleland & Durning, 2015](#)).

References

- Bing-You et al., 2018 Bing-You R, Varaklis K, Hayes V, Trowbridge R, Kemp H, McKelvy D. The feedback tango: an integrative review and analysis of the content of the teacher–learner feedback exchange. *Academic Medicine*. 2018;93:657–663.
- Blanco et al., 2016 Blanco MA, Gruppen LD, Artino Jr AR, Uijtdehaage S, Szauter K, Durning SJ. How to write an educational research grant: AMEE Guide No 101. *Medical Teacher*. 2016;38:113–122.
- Bordage, 2009 Bordage G. Conceptual frameworks to illuminate and magnify. *Medical Education*. 2009;43:312–319.
- Bourdieu, 1990 Bourdieu P. *In other words: essays towards a reflexive sociology* Palo Alto, CA: Harvard University Press; 1990.
- Bourdieu and Wacquant, 1992 Bourdieu P, Wacquant L. *An invitation to reflexive sociology* Chicago: University of Chicago Press; 1992.
- Cleland, 2015 Cleland JA. Exploring versus measuring: considering the fundamental differences between qualitative and quantitative research. In: Cleland JA, Durning SJ, eds. *Researching medical education*. London: Wiley; 2015;3–14.
- Cleland and Durning, 2015 Cleland JA, Durning SJ. *Researching medical education* London: Wiley; 2015.
- Cleland et al., 2015 Cleland JA, Kelly N, Moffat M, Nicholson S. Taking context seriously: explaining widening access policy enactments in UK medical schools. *Medical Education*. 2015;49:25–35.
- Cleland et al., 2018 Cleland JA, Durning SJ, Driessen E. Medical education research: aligning design and research goals. *Medical Journal of Australia*. 2018;208(11):473–475.
- Cresswell and Plano Clark, 2010 Cresswell JW, Plano Clark VL. *Designing and conducting mixed methods research* Thousand Oaks, CA: Sage Publications; 2010.
- Donaldson et al., 2000 Donaldson MS, Corrigan JM, Kohn LT, eds. *To err is human: building a safer health system*. National Academies Press 2000.
- Durning et al., 2014 Durning SJ, Costanzo M, Artino AR, et al. Using functional magnetic resonance imaging to improve how we understand, teach, and assess clinical reasoning. *Journal of Continuing Education in the Health Professions*. 2014;34:76–82.
- Ginsburg et al., 2015 Ginsburg S, Van der Vleuten C, Eva KW, Lingard L. Hedging to save face: a linguistic analysis of written comments on

- in-training evaluation reports. *Advances in Health Sciences Education*. 2015;21:175–188.
- [Holmberg et al., 1999](#) Holmberg L, Baum M, Adami HO. On the scientific inference from clinical trials. *Journal of Evaluation in Clinical Practice*. 1999;5:157–162.
- Lincoln and Guba, 1985 Lincoln YS, Guba EG. *Naturalistic inquiry* Thousand Oaks, CA: Sage; 1985.
- [McGaghie and Kristopaitis, 2015](#) McGaghie WC, Kristopaitis T. Deliberate practice and mastery learning: origins of expert medical performance. In: Cleland JA, Durning SJ, eds. *Researching medical education*. London: Wiley; 2015;219–230.
- McMillan, 2015 McMillan W. Theory in healthcare education research: the importance of worldview. In: Cleland JA, Durning SJ, eds. *Researching medical education*. London: Wiley; 2015;15–24.
- [Scarff et al., 2019](#) Scarff CE, Bearman M, Chiavaroli N, Trumble S. Trainees' perspectives of assessment messages: a narrative systematic review. *Medical Education*. 2019;53:221–233.
- [Schreurs et al., 2019](#) Schreurs S, Cleutjens K, Collares CF, Cleland J, oude Egbrink MGA. Opening the black box of selection. *Advances in Health Sciences Education*. 2019;25:363–382.
- [Solhjoo et al., 2019](#) Solhjoo S, Haigney MC, McBee E, et al. Heart rate and heart rate variability correlate with clinical reasoning performance and self-reported measures of cognitive load. *Nature Research Scientific Reports*. 2019;9:14668.
- [Van Merrienboer and Sweller, 2010](#) Van Merrienboer JJG, Sweller J. Cognitive load theory in health professional education: design principles and strategies. *Medical Education*. 2010;44:85–93.

Diversity, Equality and Individuality

Petra Verdonk, Sandra Steffens, Omar Tanay, Marie Mikuteit, Stephanie Okafor, Konstantin Jendretzky, Francissca Appiah, Kambiz Afshar and Maaïke Muntinga¹, (in collaboration with KritMeds and Comenius Project Equal Opportunities)

Trends

- To foster a medical culture that maximally contributes to equal social and health outcomes, we need to ‘fix the numbers’ and ascertain access to medical school and career progress, but we also need to ‘fix the institutions’ and to ‘fix the knowledge’ by establishing inclusive processes and practices. This includes the pedagogic and research climate in which medical students are socialized as health professionals.
- According to social movement theory, social networks of staff and students can bring about social change by challenging practices of exclusion, initiating ‘courageous conversations’ and fostering diversity, equity, and inclusion in medical education.
- Two related projects are described and discussed that aimed to: (1) create space for critical dialogue, sharing experiences, fostering courageous conversations, developing skills and (self-)respect; (2) encourage network participants’ awareness of institutional(ized) injustice, by learning about diversity and processes of in- and exclusion, and (in)equity, and; (3) mobilize staff, students and other stakeholders to challenge inequity and exclusion.

Key concepts

- Diversity: differences among individuals along dimensions of social identities, such as gender, ethnicity/race, or sexual orientation.
- Equity: unequal opportunities between people along dimensions of social identities exist and unbalanced conditions should be corrected to reach equal outcomes.
- Inclusion: how people along dimensions of social identities feel and are valued within a given setting.
- Intersectionality: multiple and coexisting social identities establish unique (bio)social locations that are associated with privilege and disadvantage and codetermine individuals' experiences and outcomes, including in health and education.
- Social movement theory: study of social movements, which refers to active networks through the intentional mobilization of individual actors towards a shared objective, mostly issues of social injustice.

Introduction



"Here we are, here we stand, at bedsides

We've come to cure, to care for wounds

To make whole what is shattered

To mend what is broken.

We have come to open windows so that fresh air can flow

To open jammed doors with a massive kick

To create space for who we are

in all our shine and all our strength.

We show how we're sometimes shut out,

Not seen, not valued or recognized

And how it goes that wounds between the sheets we close

While others we expose.

We are here to point out where it hurts when nobody asks.

Reveal it in the middle of the hall,

down, past these walls,

In the canteens and conference rooms.

We've come to heal, cure, soothe, do well

But not to bow, or to keep quiet.

To compromise or stay unseen,

no, not to hide behind disregard and distress.

Here we are, here we stand

We are whole, and here to heal."

Babs Gons (an excerpt from the poem featured in 'Variations on White')

A diverse workforce is considered important in its own right, as well as for achieving equitable and accessible health care for traditionally underserved populations (Young et al., 2017). Formal efforts to diversify the workforce are made by improving access to medical education and supporting career progress for all students ('fixing the numbers') (Lypson et al., 2010; Young et al., 2017). Countries have different approaches to 'fixing the numbers' as for example in the United States, an educational programme can use affirmative action to correct the balance of underrepresented groups among the student or staff population. These groups are also assumed to address healthcare inequities more often. Getting the numbers right is important and various pipeline programmes to increase the diversity of the applicant pool have been well described in the literature. Evidence supports the 'pipeline' approach to improve the student applicant pool (e.g., Young et al., 2017) and the resident applicant pool (e.g., Lypson et al., 2010).

In addition, it is also important to foster a medical culture that maximally contributes to a culturally inclusive learning environment that can lead to equal social and health outcomes. With that in mind, this chapter will describe interventions aiming to 'fix the knowledge' and 'fix the institutions' by establishing inclusive processes and practices (Verdonk et al., 2016; Verdonk et al., 2019). In this chapter, we describe two related projects aimed at challenging inequity and exclusion in medical education.

In medical education, a focus on diversity, equity and inclusion aims to prepare medical students for increasingly diverse patient populations. However, knowledge about health and illness produced in Western medicine is largely based on white epistemic traditions and the study of white bodies, benefiting mostly male, white, Western patients and healthcare professionals (Sharma, 2019). To date, professionals are heavily invested in the cultural beliefs that medical knowledge is neutral, value-free and universal, which reinforces internalized 'difference blindness' as a professional value (Sharma, 2019). Such epistemic traditions and value systems are transmitted to medical students in the formal (e.g., textbooks, lectures, skills training), informal (e.g., teacher-student interactions) and hidden curriculum as described in an earlier chapter of this book. Moreover, in many Western European medical schools (including the schools mentioned in this chapter) faculty members are predominantly white. Dominant epistemic traditions and homogeneous role modelling in medical environments reflect and perpetuate asymmetries of power, and shape individual experiences with exclusion and oppression (Sharma, 2019). Institutionalized inequities occur, for example, in the form of wage gaps, poor career opportunities, misrepresentation or underrepresentation in curricula, as well as through individual experiences with sexual harassment and racism, problems that have proven to be ubiquitous and persistent in academic medicine (National Academies of Science, Engineering and Medicine [NASEM], 2018).

Participatory projects with staff and medical students took place in two medical schools in the Netherlands (Amsterdam UMC) and Germany (Hannover Medical School). As combined grassroots and institutional efforts, the projects were initiated to

create space for difference and to encourage dialogue about justice, equity and inclusion in networks of medical students and educators. In the two projects, small mixed groups developed education modules, and initiated 'courageous conversations' within and between the schools. We found that participating in the project mobilized participants' (self-)capacity to interrogate institutional norms that perpetuate inequity and exclusion, helped raise critical consciousness about medicine's and medical education's share in upholding injustices, and promoted the developed of a shared language for speaking up about these experiences (critical literacy). The projects shared the following objectives:

1. To create space for critical dialogue, sharing experiences, fostering courageous conversations, developing skills and (self-)respect.
2. To encourage network participants' awareness of institutional(ized) injustice, by learning about diversity and processes of in- and exclusion, and (in)equity.
3. To mobilize staff, students and other stakeholders to challenge inequity and exclusion.

Theoretical background

The theoretical framework of this chapter is grounded in intersectionality and social movement theory (Nielsen, 2019; Verdonk et al., 2019). Intersectionality is useful, because single-category (gender only, or gender first, or ethnic background) approaches towards social justice, such as gender mainstreaming, have not brought about sufficient change (Verdonk et al., 2016). So far, neither the influx of female or ethnic minority doctors nor the increasing evidence for the relationship between gender and health or race, culture and health has 'fixed' medical institutions into socially just institutions (e.g., Muntinga et al., 2016). To date, gendered and racial injustices (sexual harassment, explicit and implicit biases, sexism and racism) within our institutions detract opportunities from women and minoritized individuals (NASEM, 2018). Practices of normalization socialize medical students and doctors to keep silent, individually cope, or leave the organization (Leyerzapf, 2019).

Collective action may offer an additional route towards social change. Institutions may change as a result of actions or events that are external and drastic (Armstrong & Stewart-Gambino, 2016; Nielsen, 2019), such as pressure by faculty who participate in social movements; for example, only after feminism pointed at gender bias in knowledge production did gender and health issues move into health institutions' consciousness, processes and practices (Verdonk et al., 2016, 2019). Change may also occur from within when institutions actively seek transformation and make efforts to incorporate diversity in higher education (Armstrong & Stewart-Gambino, 2016; Young et al., 2017). Staff and students can play a powerful role in generating change. Students are increasingly targeting discrimination and marginalization in particular related to race, gender, and sexuality, calling for universities to be inclusive and socially just 'safe spaces' where all students can learn and develop themselves (Nielsen, 2019). Social movements construct and shape social capital through strengthening social ties and enabling relationships between community members and allies, and through the development of a shared vision and ideas (Verdonk et al., 2016). Within institutions, critical communities can develop in voluntary safe spaces, often in small-scale settings, removed from the direct control of dominant or majority groups, such as women's groups advocating for better representation of women scientists' work in curricula. Such extracurricular spaces allow students to receive schooling in the critical thinking and engagement that is central to democracy (Nielsen, 2019); within them, students and staff are free to share experiences and question dominant ideologies and practices. Therefore they are valuable in their own right as educative spaces.

Ideally, staff and faculty leaders recognize the value and potential of safe spaces and support both emerging and established communities with institutional (financial, human) resources, or by publicly emphasizing specific institutional values (e.g., inclusivity, diversity, societal responsibility) (Armstrong & Stewart-Gambino, 2016). The idea of a safe space in a global context of institutionalized exclusion and discrimination may be far-fetched. However, we firmly believe that it is essential to offer students and staff of medical schools opportunities to encounter each other

outside of the everyday clinical hustle and bustle, talk freely about sensitive issues ('courageous conversations') and question normalcies and assumptions – those of others, as well as their own.

The projects

Amsterdam: Equal Opportunities project

Amsterdam UMC-VUmc is one of eight academic hospitals in The Netherlands. The hospital is affiliated with VU University, which has adopted diversity as a core organizational value, and is traditionally considered frontrunner in the Netherlands when it comes to diversity and inclusion initiatives at the campus, and at the curriculum and policy level. In the medical programme, and in particular at the undergraduate level, learning objectives related to diversity in health and healthcare are integrated in the curriculum by means of a longitudinal learning pathway 'interculturalization and diversity' that centres on diversity knowledge, diversity-responsive communication skills and critical reflexivity (Muntinga et al., 2016). The largest share of the pathway's educational content is taught in the undergraduate curriculum.

The participatory project *Equal Opportunities* aimed to fill the gap between undergraduate and graduate education on diversity issues. Carried out in close collaboration with students, physicians and a visual artist, the project's objective was to iteratively design and implement a graduate module about diversity, equity and inclusion in the medical work environment, with the aim to curriculize courageous conversations at the clinical training level. A parallel objective was to develop critical reflexivity and a shared consciousness of how dominant norms around medical professionalism benefit some and disadvantage others, and to build a community of critical individuals with the capacity to challenge norms and practices of inequity and exclusion. The project resulted in a flexible, composite module that consisted of four interrelated but separate building blocks.

The development phase took place over a 10-month period. A diverse group of 15 medical students and physicians met in alternating composition once every 2 weeks in sessions led by a teacher (MM) and visual artist Lina Issa (Art Partner). The content of the sessions was informed by the outcomes of the previous session and participants' learning needs. For example, one session consisted of an open brainstorm about dominant norms around medical professionalism and work floor behaviour, including the clinical training environment. Some dominant norms mentioned were 'know it all and don't make mistakes', 'blue eyes, blond hair', or 'separate your private life from your professional life' (see Box 55.1).

Box 55.1

Building block 1: Naming Norms

Aim: To name and point out dominant, explicit and implicit norms about medical professionalism. Students are handed flashcards that contain norms about the ideal professional, as well as statements about experiences of project group members. Students stand in a circle and alternately read the norms on their cards aloud.

The ideal intern ... (e.g.,) works really hard, does not want a break, does not get in the way, cares about their appearance, gets along with the group, is not vulnerable or sensitive.

In another session, participants wrote out 'scenarios' of their own experiences of (felt) ethnicized or gendered incidences in the classroom or on the work floor. We analysed and discussed the scenarios applying threshold social justice concepts, such as privilege, micro-aggressions, Othering and racism/sexism. The scenarios served as the basis of [Box 55.2](#).

Box 55.2

Building block 2: Case Dialogues – analysing scenarios of oppression

Aim: to collectively discuss experienced cases about exclusion, and to analyse these cases using tailored dialogue questions. Cases are discussed in small groups of four or five participants. One participant guides the conversation using the dialogue questions provided with the case. Example:

"They might think you're gay."

Christian (24), medical student: During my internship I received feedback on my professional functioning. I was in the middle of my medical transition—I am transgender. I can still picture the evaluation setting: we are in the teacher's office, an older, white lady with a rather snappy attitude. She says, "Your knowledge is fine, but you have to show more of yourself." I thought, "I know what you mean, but this is only my first internship". But instead I say, "You are right. But it is difficult for me to speak up especially because my voice has not lowered yet and people still call me Madam." Next the teacher says, "You look very young, which you have to compensate by stepping up more. Otherwise you won't be taken seriously, and won't be able to be a doctor, because people might think you are a homosexual." I didn't know how to respond! I let it pass, too astonished by the situation.

Dialogue questions for this case are, for example:

1. 'What assumptions are made in the case?'
2. 'What might be the role of the gender/ethnicity of the persons in the case? How does culture play a role here, and whose culture?'
3. 'What can I learn about myself from this situation?'

We formulated possible alternative 'responses' to the incidences of exclusion shared by participants, with the aim to build a repertoire that can be used in a 'courageous conversation'. Carefully prepared responses may allow students or physicians who otherwise would have remained silent to point out and 'mark' instances of oppression and disrupt the normalization of problematic behaviour or speech ([Box 55.3](#)).

Box 55.3

Building block 3: Marking Oppression

Aim: To encourage participants to build a repertoire of responses for speaking up when experiencing or witnessing exclusion in a professional or training environment.

Participants are asked to formulate responses to the situations presented in the cases of building block 2. They can choose from five response types: factual, reflective, anecdotal, emotional, and humour-based responses. Examples of potential responses to the case “They might think you’re gay”:

“I am gay, is that a problem for you?” (factual)

“I am not sure where this association comes from, could you explain that to me?” (reflective)

“Well, my supervisor Dr. Z. is a great physician!” (anecdotal)

The final responses formulated by the small group can be shared in the larger group.

Finally, participants collaborated on a scenario for a short film directed by Lina Issa titled *Variations on White*, in which several group members explore their individuality in relation to the ‘white coat’, which symbolizes neutrality, universality and objectivity, and represents professionalism as ‘whiteness’ (Box 55.4).

Box 55.4

Building block 4: Variations on White

Aim: To show how diversity and individuality are embodied by a new generation of young medical professionals who bring their own backgrounds into the white coat and use these images of the merging of private and professional identities to disrupt dominant norms of what a medical professional should look like, should do or should value. The sound featured in the film is provided by Babs Gons, a Dutch poet, who, in a voice-over, recites a poem she specifically wrote for the occasion (see excerpt at the top of this chapter).

(*Variations on White* (5’20’’), 2018. In Dutch, English subtitles. Director: Lina Issa. <https://vimeo.com/288631144>.

Password: White)

Hannover: Kritische Mediziner*innen (Critical Physicians)

The Hannover Medical School (MHH) was founded in 1965 and offers study programmes in medicine, dentistry, public health and biomedicine. The percentage of female medical students has increased to 70% in the past 10 to 15 years. There is no information about the percentage of students across ethnic groups, sexual and gender diversity, or other aspects of student diversity.

'Fixing the knowledge', or integrating diversity in medical curricula, is important to prepare medical students to become more diversity-responsive physicians ([Muntinga et al., 2016](#)). An external funding programme from the Maria-Goeppert-Mayer Program of the Ministry for Science and Culture of the State of Lower Saxony (MWK) allowed for expert support in tailoring gender and diversity mainstreaming activities (PV). At the Institute for General Practice, a project was conducted to promote gender and diversity mainstreaming in teaching and research activities, and to support concrete actions for sustainable implementation. Gender and diversity aspects were integrated in the general practice curriculum of undergraduate medical training. However, the project had a larger spin-off besides curriculum change. The increased visibility of mainstreaming actions within the faculty accelerated networking between staff, across departments, and with students. The new and beginning network of staff allied with a loosely mobilized activist student group that was already focusing on gender diversity, sexual harassment within the school, and on women's reproductive rights.

Although German equal rights legislation (AGG) has also been incorporated into medical education, much remains to be done. After a controversial media debate on sexual discrimination in the aftermath of #MeToo, a student initiative, called the Kritische Mediziner*innen (KritMeds), formed in 2018 at the MHH to discuss the influence of patriarchal structures at the faculty. As part of the preparation for a panel discussion on sexism, the KritMeds surveyed undergraduate medical students and physicians at MHH regarding their experiences involving sexual discrimination and their views on equal opportunity. An anonymous online survey on equal opportunities and sexual discrimination was applied, supported by the Department of Curriculum Development ([Jendretzky et al., 2020](#)). Further questions within the survey targeted students' perspectives on the existing support structures at MHH in cases of sexual discrimination.

Activity 1: The survey

A total of 343 students (15%) participated in the survey that was designed by students with the support of staff. Over 50% of respondents reported having either witnessed sexual harassment or experienced it themselves. Female students indicated having experienced sexual harassment three times more often than their male peers did; verbal forms of sexual discrimination predominate. These observations and experiences of sexual harassment demonstrated significant influences on many perceptions regarding equal opportunity and equal treatment in the MHH undergraduate medical education ([Jendretzky et al., 2020](#)).

Furthermore, an extracurricular lecture schedule, organized by the students, was formed to create awareness for intersectionality and discrimination of minorities. Two students of the Kritische Mediziner*innen Project Group, who underwent special training, organized two strategy workshops on how to deal the issue of sexualized discrimination and violence in particular.

Activity 2: “I was just kidding...” Strategy workshop on dealing with everyday sexism in medicine

The aim of this method is to impart self-confidence for coming situations and develop skills and possible strategies in dealing with sexist discrimination in the exchange of experiences.

First, all undergraduate medical students were invited to anonymously register for the workshop. With approximately 10 to 15 participants, the workshop was designed to create a ‘courageous space’ and role-play through situations in which the participants have felt uncomfortable or harassed in everyday life on the ward, in the classroom, or in the laboratory.

Tips and strategies for contact with discrimination were for example:

- There is not just one sentence, the one magic formula, that will help in all situations of discrimination.
- Discriminated persons are not responsible to fight against their own discrimination. There is always a social dimension that should be addressed too.
- It is important to say something, either immediately or later.
- A strategy to address discrimination is outlined in the following three steps. It may help to do a roleplay with possible reactions on the three steps in a group.
 - Name (e.g., “You just said...” within a professional discussion.)
 - Evaluate (e.g., “I don’t think that this is appropriate” / “I feel uncomfortable.”)
 - Request/demand (e.g., “Please don’t act like this” / “Please use this expression.”)

After the network expanded with the expert and staff at MHH, a workshop Diversity, Equity and Inclusion was designed based on the MHH survey outcomes, and on the Amsterdam Building blocks. The workshop is directed towards teachers and students simultaneously, following the motto of ‘teach the teacher’. Building blocks were translated, including the vignettes and the video, and new building blocks were added. So far, three workshops were organized with approximately 50 participants, students and teachers.

Activity 3: Workshop diversity, equity and inclusion in medical education

Aim: To foster open exchange among participants to mutually raise sensitivity to and awareness of the topic and to encourage reflexivity in daily routines.

A central element is a reenactment of reported harassment cases (survey) and discussion among the participants, for example:

“In my nursing internship, a relatively young patient told me when he was discharged: ‘I would like to come back when I’m 80, if such pretty young things will take care of me.’”

An OR nurse (a man) asked me (female working student in the OR) as he helped me

to close the sterile scrubs: “Hey, can I get in your pants?”

In our course, the teacher read the names out loud. My name was pronounced false, so I corrected the teacher. They* answered that they* had not always the time to look at the students before reading their names. I do not look German.

(*Variations on White* (5’20’’), 2018. Director: Lina Issa.

<https://vimeo.com/342662505>

Password: black)

Besides the implementation of a journal club with students and teachers to discuss critical papers, a discrimination-reporting platform was created. The platform #SayIt (<http://www.mhh.de/sayit>) was inspired by similar platforms in Berlin and the Netherlands (<http://www.zouikwatzeggen.nl>, Amsterdam UMC-Vrije Universiteit). In 2019 the platform was made available to students on the official MHH website, and the platform will soon be open to all doctors. #SayIt aims to increase awareness of the everyday dimensions and challenges normalized social practice of sexual and other forms of discrimination. These practices include among other things the ‘gender routines’ that are deeply rooted in our institutions and embedded in practices and procedures. For example, as regards to gender, it acknowledges that institutionalized gendered social injustice occurs. Too often there is the impression that acts of humiliation, in its various forms, are merely isolated events—that harm was unintended, or that the act was just meant to be ‘a joke’.

Activity 4: #SayIt

The aim of this anonymous reporting platform is to break the silence and silencing which goes hand-in-hand with incidents of discrimination. Platform submissions will be published on a website if the reporting individual gives explicit permission. By posting the comments, everyone will be able to see that their experience is not an isolated case but rather a structural problem that is densely interwoven with the learning and working environments and deeply affecting individuals’ health and private lives.

With #SayIt, the network created a platform to promote respectful behaviour at MHH. Sexism, racism and discrimination of all forms are visualized, without blaming the offenders. Comments are collected and published anonymously, inviting the readers to think, reflect, and discuss.

(MH-Hannover: Say it! Antidiskriminierungsplattform für Studierende.
<https://www.mh-hannover.de/sayit.html>.)

Reflection: the two projects in comparison (Table 55.1)

According to social movement theory, growing a network of people committed to a cause is the key to social change. In Amsterdam, participants and staff had direct and personal experiences of exclusion and oppression but were initially not gathered as a network with a 'collective identity'. Nonclinical staff at the periphery of medical school initiated the network (MM); she had a nonhierarchical role and taught social science and humanities-related subjects (ethics and diversity). Participants were recruited through snowballing, personal networks, or members of the nonactivist medical students' association committee on diversity. None of the students explicitly identified themselves as activist. This diverse network did not completely establish a collective identity with a shared vision as a result of the courageous space, as the network comprised an explicit diverse group including a diversity of voices and ideas. In the network, experiential knowledge was collected, and knowledge was created and translated into the building blocks. Furthermore, the Amsterdam building blocks are going to be implemented in the regular graduate curriculum, consensus is built within the faculty (consensus-oriented approach), and the developed network was loose, not activist, yet committed to challenging exclusion and discrimination.

Table 55.1 Characteristics of the courageous spaces in Amsterdam and Hannover

| Amsterdam UMC-VUmc | Hannover Medical School |
|--|---|
| <ul style="list-style-type: none"> • Organized and invited by nonclinical staff • Supported by government grant and leadership of education institute • Diverse group; gender, race, ethnic background, religion, sexuality, students and junior doctors • Personal experiences with oppression towards different differences (intersectional) • Not yet an established network • Sharing experiences of inequity and exclusion helped establish network • Codeveloped building blocks for implementation in required curriculum • Focus on individual capacity building, developing language • Consensus-oriented approach | <ul style="list-style-type: none"> • Self-organized in KritMeds and supportive students • Supported by Department of Curriculum Development from within education institute • Homogenous 'natural' group, white, cisgender, mainly older year students • Shared values (e.g., climate, women's reproductive rights), activist experience, personal experience with sexism • An established network based on shared views and ideas aiming for social change • Codeveloped extracurricular activities to foster courageous conversations • Focus on conscientization and mobilization of students and staff • Conflict-oriented approach |

At MHH, an established activist group 'the KritMeds' quickly accommodated the building blocks developed in Amsterdam to their local needs, incorporated own experiences and knowledge, and continued campaigning. The MHH approach to change could be defined as a more conflict-oriented approach in using a compelling message to convince new audiences, for example by referring to the school's survey

results on sexism ([Jendretzky et al., 2020](#)). Furthermore, the KritMeds as a natural group had already established a relationship with the education organization (department of Curriculum Development, SS) which yielded resources—rooms, finance, faculty time. The expert offered an extra, and accelerating, opportunity for collaboration to strive for social change, grasping the political opportunity for a joint vision that was explicitly supported by the gender and diversity mainstreaming project at the Institute for General Practice. The fast uptake of the Amsterdam Building blocks and the deliberate design of the workshop on diversity to be ‘self-sustainable’ by students and staff does not guarantee long-term implementation. We did however develop a ‘chain’-strategy in which new students participate in the workshop and then are invited to have an active role in the subsequent one.

Summary

In addition to existing initiatives for pipeline development and training programmes, a social movement approach by developing social networks of staff and students seems to have much to offer in terms of social change and fostering diversity, equity, and inclusion in medical education. Building alliances at the margins of existing structures and using nonhierarchical and participatory approaches can bring students and staff together, help develop a shared vision and strategy, and encourage courageous conversations about identity, inequity and exclusion. Jointly, the networks in Amsterdam and Hannover created and used momentum by connecting activities that aimed towards more inclusive institutions. Participants shared and translated experiences, visions, and ideas into practical building blocks and activities, and invited staff and students to step and speak up and learn how to challenge injustice. Possible difficulties with sustainability and long-term implementation should not withhold anyone from establishing critical social networks or engaging in activism in higher education—successes must be claimed despite not having reached unattainable ideals. Whatever the (other) long-term effects of social movements will be, those participating in it have gained critical consciousness, acquired the skills to mobilize networks for collective activities and action, built (self-)respect, developed interpersonal skills and mutual understanding, and learned a language to point out and speak up.

References

- Armstrong and Stewart-Gambino, 2016 Armstrong MA, Stewart-Gambino H. Building curricular diversity through a 'social movement'. *Journal of Curriculum Theorizing*. 2016;31(1):112–125.
- Jendretzky et al., 2020 Jendretzky K, Boll L, Steffens S, Paulmann V. Medical students' experiences with sexual discrimination and perceptions of equal opportunity: a pilot study in Germany. *BMC Medical Education*. 2020;20:56.
- [Leyerzapf, 2019](#) Leyerzapf, H. (2019). Doing diversity: Unsettling the Self-Other binary. Cultural diversity in Dutch academic health care. Amsterdam: Amsterdam UMC-VUmc, PhD-thesis.
- Lypson et al., 2010 Lypson ML, Ross PT, Hamstra SJ, Haftel HM, Gruppen LD, Colletti LM. Evidence for increasing diversity in graduate medical education: the competence of underrepresented minority residents measured by an intern objective structured clinical examination. *Journal of Graduate Medical Education*. 2010;9:354–359.
- Muntinga et al., 2016 Muntinga M, Krajenbrink V, Peerdeman S, Croiset G, Verdonk P. Toward diversity-responsive medical education: taking an intersectionality-based approach to a curriculum evaluation. *Advances in Health Sciences Education*. 2016;21:541–559.
- National Academies of Sciences, Engineering, and Medicine, 2018 National Academies of Sciences, Engineering, and Medicine. *Sexual harassment of women: climate, culture and consequences in academic sciences, engineering, and medicine* Washington D.C: The National Academies Press; 2018.
- Nielsen, 2019 Nielsen GB. Radically democratising education? New student movements, equality and engagement in common, yet plural, worlds. *Research in Education*. 2019;103(1):85–100.
- Sharma, 2019 Sharma M. Applying feminist theory to medical education. *Lancet*. 2019;393:570–578.
- Verdonk et al., 2016 Verdonk P, Muntinga M, Croiset G. Gender en diversiteit in het geneeskundeonderwijs Maakt gendermainstreaming verschil?. *Tijdschrift voor Genderstudies*. 2016;19(2):225–239.
- Verdonk et al., 2019 Verdonk P, Muntinga M, Leyerzapf H, Abma T. From gender-sensitivity to an Intersectionality and participatory approach in health research and public policy in the Netherlands. In:

Hankivsky O, Jordan-Zachary JS, eds. *The Palgrave handbook of intersectionality in public policy*. Cham: Springer, Palgrave Macmillan; 2019;413–432. https://doi.org/10.1007/978-3-319-98473-5_18.

Young et al., 2017 Young ME, Thomas A, Varpio L, et al. Facilitating admissions of diverse students: a six-point, evidence-informed framework for pipeline and program development. *Perspectives in Medical Education*. 2017;6:82–90.

¹KritMeds student group consists of Anna Kastner, Jacqueline Niewolik, Sarah Gries, Anja Goette, Sebastian Schröder, Ruth Katzenberger, Marie Mikuteit, Konstantin Jendretzky. KritMeds are medical students at Hannover Medical School.

Index

Page numbers followed by “*f*” indicate figures, “*t*” indicate tables, and “*b*” indicate boxes.

A

Absolute standards, [275](#)

Abstraction, as element in simulation, [110](#)

Acceptability, of assessment, [290](#)

Accountability, in outcome-based education, [132](#)

Accreditation Council for Graduate Medical Education (ACGME), [130](#)

Accreditation, problem-based learning (PBL), [155](#)

Active learning, [183](#), [193](#)

Active participation, in small groups, [74](#)

Activity(ies)

- decentralized, in staff development, [352](#)

- learning, in interprofessional education, [151](#)

- purposeful, in small groups, [74](#)

Adaptive leadership, [431t](#)

Adult learning

- model, [77](#)

- principles, in small groups, [74–75](#)

- in staff development, [356–357](#)

Adult learning theory, in interprofessional education, [151](#)

Adverse events, reporting and learning from, [230](#)

Affective leadership, [431t](#)

Aggregation, of assessment through meaningful entities, programmatic assessment, [328](#)

Ambulatory care learning, tips for, [81](#)

Ambulatory care teaching, [86–88](#)

- innovative venues for, [87–88](#)

- integrated programme, [88](#)
- traditional venues for, [87](#)
- when to provide, [86–87](#)

Ambulatory Care Teaching Centre, [86–87](#)

American Board of Internal Medicine (ABIM), professionalism and, [214](#)

Amsterdam UMC-VUmc, [465](#), [469t](#)

Application exercise (AppEx), [166–167](#)

Apprenticeship Model, [18](#)

Apprenticeship/parallel consultation model, [87](#)

Apprenticeship/shadowing a junior doctor model, [86](#)

Apps, distance learning, [122](#)

Arousal, lectures, [66](#)

ASPIRE program, [407](#)

Assessment(s)

- blueprints, [275–276](#)
- clinical competence, [290–292](#)
- competency, [210](#)
- concepts in, [271](#), [271b](#)
- curriculum model, [305](#)
- diagnostic, [273](#)
- of ethical and professional attitudes, [209–210](#), [210f](#)
- formative, [272](#)
- for information retrieval and analysis, [266–267](#)
- integrated learning, [143–144](#)
- in interprofessional education, [151–152](#)
- issues to be addressed in, [11–12](#)
- Miller's levels, *See* [Miller's levels of assessment \(skills and competencies triangle/pyramid\)](#)
- objective, [276](#)
 - versus subjective, [276–277](#)
- performance, *See* [Performance](#)
- portfolios, [297–299](#)
- preparing, [11–12](#)
- professionalism, *See* [Professionalism](#)
- programmatic, [323](#)
- qualities of a good, [273](#)
- reliability, *See* [Reliability](#)
- self-assessment, [276](#)
- social and behavioural sciences, [194–195](#)
- standards in, [275–276](#)

- subjective, [276](#)
 - objective versus, [276–277](#)
- summative, [272](#)
- 360-degree, *See* [Multisource feedback \(360-degree assessment\)](#)
- types of, [272–273](#)
- of uncertainty/shared decision making, [268](#)
- workplace, *See* [Workplace](#)
- written, [279](#)
 - quality control of items, [280](#)
 - question format, [279–280](#)
 - response formats, [280–285](#)
 - stimulus formats, [285–286](#)
 - trends, [279b](#)
 - See also* [Assessor](#), [Mini clinical evaluation exercise \(Mini-CEX\)](#), [Self-assessment](#)

Assessor

- role of, [300–301](#)
- training of, [301](#)
- outcome-based education and, [130](#)

Association of American Medical Colleges (AAMC), [130](#)

Attainment, [215](#)

Attention, in lectures, [66](#)

Attitudes

- assessment of, [315](#)
- ethics and, [205](#), [205b](#)
 - assessment of, [209–210](#)
 - critical challenges in, [206–207](#)
 - undergraduate education, [207–209](#)
- special nature of, [210–211](#)

Attrition, [215](#)

Audience response system (ARS), [68](#)

Audiovisuals, lectures, [68](#)

‘Authentic leader’, [430](#)

Authentic leadership, [431t](#)

Authentic learning, [183](#)

B

Basic sciences, *See* [Sciences \(basic\)](#)

Behavioural skills, role play and, [199](#)

Biomedical knowledge, in cloud, [262–263](#)

Bloom's taxonomy, [68](#)

Blueprinting, professionalism, [318](#)

Blueprints

assessment, [275–276](#)

OSCE, [290](#)

Breakout model, [87](#)

Building capacity, medical education research, [460–461](#)

Burnout, [371](#)

compassion, [372](#)

prevention and recovery, [371](#)

Business ward round, [86](#)

'Buy in,' staff development programmes, [356](#)

Buzz groups, [69–70](#)

C

Cambridge Community-based Clinical Course, [103](#)

Cambridge Integrated Clerkship (CIC), [103](#)

CanMEDS, OBE and, [130](#)

CAPA-CAR model, [421](#), [421f](#)

Careers choice, [413–415](#)

Careers guidance, [413–414](#)

Caring leadership, [431t](#)

in small groups, [75](#)

See also [Problem-based learning \(PBL\)](#)

Case-based learning, [158–159](#)

Case-based material discussion (CBD; chart-stimulated recall), [293](#)

See also [Vignettes, clinical](#)

Case studies, clinical teaching, [86](#)

Centre for Biomedical Ethics in 2007, [208](#)

Change, in doctor-patient relationship, [206](#)

Charismatic leadership, [431t](#)

Classical test theory (CTT), [271–272](#)

Clerkships, [247–249](#)

Clinical assessment (skills and competence), [290–292](#)

Clinical authenticity, 10

Clinical communication skills, 197, 197*b*

- professionalism, 202

- role play (simulation), 198–199

- wider context of, 199–202

Clinical competence, 289

- assessment of, 292

Clinical conference, 86

Clinical learning environment, 447, 448*b*

Clinical reasoning, 253

- context-specific, 257–258

- definition, 253

- development of, 258, 259*t*

- expert performance, practice, 256

- illness scripts, 255, 255*t*

- knowledge organization, 255, 255*t*

- motivation and emotion, 256–257, 258*b*

- multiple strategies and flexibility, 255–256, 257*t*

- theories, 253–254, 254*t*

Clinical teaching, 81, 88*t*

- ambulatory care opportunities, 86–88

- assessment, 88

- Cox's cycle, 83–84, 84*f*

- hospital ward opportunities, 86

- MIPLAN for, 84

- patients in, 82

- staff development, 88–89

- strategies for, 83

 - case studies, 86

 - inpatients, 83–84

 - learning and performance, 85, 85*b*

 - outcome-based education, 85

 - outpatients, 84–85

 - problem-based learning, 86

 - structured logbooks, 85

 - study guides, 86

 - task-based learning, 85

- students and, 82

- tutors for, 82–83

Clinical pearls toolkit, 247

Clinical Presentation-Based Model, 18

Clinical question, framing an appropriate, [265–266](#)

Clinical reasoning

- aids to, [263](#)
- appropriate knowledge of, [83](#)
- attitudes of, [83](#)
- seven roles of, for achieving good clinical teaching, [82b](#)
- skills of, [82](#)
See also [Doctor\(s\)/physician\(s\)](#)

Close calls, reporting and learning from, [230](#)

Coaching, [310–311](#)

- action plan, [311b](#)
- improvement, [311b](#)
- peer, of staff, [352](#)
- portfolio assessment, coach role, [300–301](#)
See also [Training](#)

Codes of conduct, published, framing assessments against, professionalism, [317](#), [317b](#)

Collaborative leadership, [431t](#)

Collaborative learning, [95](#)

Colleagues

- communication between, [200–201](#)
- interprofessional, as additional sources of information, [267–268](#)

Common curriculum model, [151](#)

Communication skills

- about curriculum, [12](#)
- clinical, [197](#)
 - professionalism, [202](#)
 - role play (simulation), [198–199](#)
 - wider context of, [199–202](#)
- between colleagues, [200–201](#)
- culture, [201–202](#)
- formats, role play, [198–199](#)
- and hi fidelity simulation, [201](#)
- international medical graduates (IMGs), [201–202](#)
- language, [201–202](#)
- medical records, [200](#)
- professionalism, [202](#)
- reading and writing, [201](#)
- role play session, [199](#)
- spoken, other aspects of, [199–200](#)

Community, challenges of LICs for, [107](#)

Community-based learning, [194](#)

Community-based medical education (CBME), [91–92](#)

Community-engaged medical education (CEME), [92](#)

Community of practice, students learning, [61](#)

Compassion, [371–372](#)

- action, [374](#)
- burnout, [372](#)
- leadership, [431t](#)
- self-compassion, [372–373](#)
- teaching compassion with, [373](#)
- weakness/unfairness, [372](#)

Competency-based education, [306](#)

Complementary and alternative medicine (CAM), [247](#)

Computer-aided instruction, [353](#)

Confidence calibration, [264–265](#), [264f](#)

“Consensus professional judgement”, [210](#)

Continuous learning, [311](#), [312f](#)

Continuous professional development (CPD), [31](#)

- change, [37](#)
- definition, [31](#)
- evolution, [32–34](#), [33f](#)
- individualized learning, [33](#)
- knowledge transfer, [34–37](#), [34f](#)
 - application, [35](#)
 - apprehension, [34](#)
 - practical implications, [35](#)
 - processing, [35](#)
 - transnationalization, [36](#)
- professional and ethical obligation, [32](#)
- regulation, [32–33](#)

technology and disruptive innovation, [37](#)

Constructivist Learning Theory, [66](#)

Constructivist notions, [324](#)

Content

- curriculum
 - agreeing on, [8](#), [9f](#)
 - organizing, [9](#), [9f](#)
- and delivery, medical humanities, [240](#)

portfolio, [297–299](#)

staff development programmes, key areas, [352–353](#), [353f](#)

Contingency theories, [431t](#)

Continuous quality improvement, [20](#)

Continuum, defined, [15–16](#)

Continuum of stakes, programmatic assessment, [325](#)

Cost effective assessment, [290](#)

COVID-19 pandemic, [3](#)

changes proposed or required after, [4–5](#)

trends, [3–4](#)

Cox's cycle, [83–84](#), [84f](#)

Criterion-referenced score interpretation, [274](#)

Critical-incident studies, [8](#)

'Critical reading', [201](#)

Critical thinking, [184](#)

Cultural competency, [191](#)

Cultural pluralism, [206–207](#)

Culture

language and, [201–202](#)

organisational/institutional, and staff development, [355](#)

See also [Multiculturalism](#)

Curriculum (curricula)

agreeing content of, [8](#)

assessment preparation, [11–12](#)

authentic, [8](#)

communication about, [12](#), [12f](#)

content, *See* [Content](#)

core content experience, [9](#)

'declared', [8](#)

definition of, [7–13](#)

design, professionalism, [317](#)

educational strategy, [9–11](#)

extended vision of, [7](#), [8f](#)

formal, [40](#)

foundational sciences, [181](#)

active learning, [183](#)

authentic learning, [183](#)

changes, [182–183](#)

- clinical reasoning, 184
- critical thinking, 184
- integration, 185
- nontraditional discipline-independent skills, 185–186
- outside curricular structure, 186
- reflection, 183, 184
- role of, 181
- teaching innovations, 184–185

hidden, 9f, 39

- applications, 41–43
- as conceptual tool for medical training, 40
- definitions of, 40–41
- exploring/assessing, 41–43
- historical context of, 40
- metaphors, 41
- power of, 207
- professionalism, 215–216
- student mistreatment, 43–44
- teaching teachers, 207
- trends, 39b

identifying the need, 7–8

integrated learning, 140–141, 140f

‘learned’, 8

management, 12–13

medical humanities and, 238–241

organizing content, 9

planning and development, 7

- managing the, 12–13
- systematic approach of, 11

promotion, 12

SPICES model, 10f

spiral, 9f

student engagement (SE), 404–405

‘taught’, 8

teacher evaluation, 419

- CAPA-CAR model, 421, 421f
- continuous quality improvement, 421, 421f
- distribution report, 425
- evaluation, 419–420, 420f, 421–425
- faculty, 426, 426t
- levels of influence, 422t
- planned *versus* emergent analysis, 423–425
- SMART criteria, 423b

teaching methods, 8

undergraduate, *See* Undergraduate curriculum

Curriculum metaphor, 325

Curriculum model, 305

Curriculum Positioning System (CPS), [13](#)

D

Daloz model, mentoring, [362–363](#), [363f](#)

Dark Triad, [431t](#)

Data, [261–262](#)

Data point, programmatic assessment, [325](#)

Decentralized activities, in staff development, [352](#)

Decision making

 aids to, [263](#)

 programmatic assessment, [328](#)

‘Declared’ curriculum, [8](#)

Deductive learning, [59](#)

Demonstrator model, [86](#)

Destructive leadership, [430–432](#), [431t](#)

Devices, digital technology repertoire, [171](#)

‘Diagnosis of deficits’ approach, [397t](#)

Diagnostic assessment, [273](#)

Dialogic leadership, [431t](#)

Digital age, health care in, [262–263](#)

Digital native learner, [263](#)

Digital professionalism, [176](#), [232–234](#)

Digital technologies, [171](#)

 action and response speed, [172](#)

 as context, [174–176](#)

 dependency, [174–175](#), [175f](#)

 e-health preparation, [176](#)

 exponential connectivity, [172](#)

 geography and temporality, [172](#)

 instructional design, [173](#)

 as intelligence, [176–177](#)

 massive integration, [172](#)

 medical e-teacher, [173–174](#)

 as medium, [171–174](#)

 natives, [175–176](#)

- as outcome, [176](#)
- panopticism, [172](#)
- professionalism, [176](#)

Direct observation of procedural skills (DOPS), [88](#), [294](#)

Discernment, [373–374](#)

Discipline-Based Model, [18](#)

Discipline-specific curricula, [192](#)

Dispersed leadership, [431t](#)

Dissertation, *See* [Thesis](#)

Distance learning, [122–123](#)

- apps, [122](#)
- digital literacies, [123](#)
- social media, [122–123](#)
- trends, [123–124](#)
- websites, [123](#)

Distance mentoring, [365](#)

Distant curricula, internationalization, [49](#)

Distraction, in digital professionalism, [217](#)

Distributed leadership, [431t](#)

Diversity environment, [449–450](#), [451b](#), [463](#)

Doctor(s)/physician(s)

- in Dundee three-circle model, [132](#), [133f](#)
- professional development, in quality and safety, continuum of, [232–233](#)
 - see also* [Clinicians](#)
 - See also* [Postgraduate medical education \(PGME\)](#)

Doctor-patient relationship, changing, [206](#)

Domain-independent skills, [324](#)

Doubleday Centre, [380](#)

Driving instructor, portfolio, [301](#)

Dundee Ready Education Environment Measure, [12](#)

Dundee three-circle model, [132](#), [133f](#)

- doctor in, [132](#), [133f](#)

Dyadic mentoring, [364](#)

E

E-health, [176](#)

E-teacher, medical, [173–174](#)

Eco leadership, [431t](#)

Education, medical

- in an era of ubiquitous information, [261](#)

- assessment in, *See* [Assessment\(s\)](#)

- continuum of, [15–16](#)

 - assessment of learner's progress and, [131](#)

- cycle of, [356f](#)

- deciding on, [9–11](#)

- distance, *See* [Distance learning/education](#)

- environment, *See* [Environment, educational/learning](#)

- lectures, [66–67](#)

- medical humanities and, [237–238](#)

- offering a diversity of methods, [357](#)

- outcome-based, *See* [Outcome-based education \(OBE\)](#)

- planning, *See* [Planning](#)

- professionalism in, *See* [Professionalism](#)

- staff development, [352–354](#)

- undergraduate, [15](#)

 - critical components of, [18–21](#)

Educational continuity, [102](#)

Educational strategies, for digital learner, [263](#)

Educators, *See* [Teachers](#)

Electives, [11](#)

Electronic health records (EHRs), [176](#), [262](#)

Electronic medical records (EMRs), [176](#)

Electronic portfolios, [299](#)

Emotional intelligence (EI), [431t](#)

Empathy

- ethics and attitudes, [205](#), [205b](#)

 - assessment of, [209–210](#)

 - critical challenges in, [206–207](#)

 - undergraduate education, [207–209](#)

- special nature of, [210–211](#)

EMQs, *See* [Extended-matching questions \(EMQs\)](#)

Engaging leadership, [431t](#)

Entrustable professional activities (EPAs), [208](#), [209t](#), [321](#)

Environment

- educational/learning, 445
 - clinical learning, 447, 448b
 - diversity, 449–450, 451b
 - evaluation and improvement, 451–452
 - learner-centred learning environment, 445–446, 446f
 - physical and architectural, 447–449, 449f
 - preclinical learning, 446, 447f
 - promoting an appropriate, 12
 - safe and supportive creation, 450–451
 - technology-enhanced learning, 449, 450b
 - trends, 445b

learning in lecture, 65–66

EPAs, *See* [Entrustable professional activities \(EPAs\)](#)

Equal Opportunities project, 465–466, 466b, 466b, 467b

Errors

- students and trainees selection
 - of conception, 389–391
 - of ignorance, 388
 - of implementation, 391–392
 - of judgment, 392–393
 - of purpose, 388–389

study of, in practice, 8

Essay questions, 281–282

Ethics

- and attitudes, 205, 205b
 - assessment of, 209–210
 - critical challenges in, 206–207
 - undergraduate education, 207–209
- education, integration of, 208f

Evaluation

- lectures, 71
- patient safety and quality of care, 232–234, 234t
- small-group session, 77–78
- staff development programmes, 357–358
- interprofessional education, 148

Evidence-based medicine (EBM), 221

- application, 224
- definition, 221–222
- educational methods and approaches, 224
- evolution of, 222–223, 222f, 223f
- faculty, 225
- implications, medical teachers, 223–226

- limitations, [224](#)
- literature, [223–224](#)
- suggestions for, [225–226](#), [226t](#)
- timing/scheduling, [224–225](#)

Exam, interprofessional standardized patient, [247–248](#)

Exercise, [373](#)

Experience(s), [9](#)

- teaching and learning, [10](#)

Extended-matching questions (EMQs), [285](#)

External attitudinal behaviour, [316](#)

F

Face-to-face contact, in small groups, [74](#)

- behaviours, educational environment, [447](#)

- challenges of LICs for, [107](#)

 - for interprofessional education, [152](#)

- in small group participation, [78](#)

Faculty of Medicine at the University of Gezira (FMUG), [442](#)

Feasibility, portfolios, [299](#)

Feedback, [307–309](#), [307b](#)

- content, [307–308](#)

- educational experiences, [308](#)

- environmental context, [308](#)

- method, [307](#)

- obtain multiple sources of, [300](#)

- personal characteristics, [308–309](#)

- programmatic assessment, [324](#)

- in role play, [198](#)

- supporting simulated patients in role portrayal and, [113–114](#)

Fellowship, integrative medicine, [264–265](#)

Flexner Report, [18](#)

Flinders University School of Medicine, [441–442](#)

Flipped classroom, [70](#), [163](#)

‘Focus scripts’, [86](#)

Fellowship, [431t](#)

Formal mentoring, [364](#)

Formative assessment, [272](#)

in interprofessional education, [152](#)

Forming stage, small groups, [77](#)

‘Formulation’ approach, [400f](#)

Forum theatre, role play in, [198](#)

Foundational sciences, curriculum, [181](#)

active learning, [183](#)

authentic learning, [183](#)

changes, [182–183](#)

clinical reasoning, [184](#)

critical thinking, [184](#)

integration, [185](#)

nontraditional discipline-independent skills, [185–186](#)

outside curricular structure, [186](#)

reflection, [183](#), [184](#)

role of, [181](#)

teaching innovations, [184–185](#)

Framing, clinical question, [265–266](#)

Fundamental principle, professionalism, [317](#)

Funding, medical education research, [461–462](#)

G

Generalist model LICs, [105](#)

Generalizability, [290](#)

Generalizability theory (GT), [272](#)

Ghent University Faculty of Medicine and Health Sciences (Belgium), [441](#)

Global Minimum Essential Requirements (GMER) specification, [132–134](#)

Global Positioning System (GPS), [13](#)

Globalization, continuous professional development, [36](#)

Global physician, internationalization, [49](#)

Global rating scales, OSCE, [291](#)

Global standards, quality improvement, [190t](#)

Goal(s)

coaching, [310](#)

of reflection, [310](#)

in staff development, [355–358](#)

of undergraduate curriculum, [16](#)

Graduate medical education, integrative medicine in, [249–250](#)

Grand rounds, [86](#)

Grandstand model, [87](#)

‘Great man’ theory, [430](#), [431t](#)

Groups, [158](#)

large, *See* [Large group](#)

mentoring, [364](#)

problem-based learning, *See* [Problem-based learning \(PBL\)](#)

role play, [198](#), [198–199](#)

small, *See* [Small groups \(learning in/teaching of\)](#)

team-based learning, *See* [Team-based learning \(TBL\)](#)

Guidance

outcome-based education and, [130](#)

portfolios and, [298](#)

H

Handouts, lecture, [70](#)

Hannover Medical School (MHH), [466–469](#), [469t](#)

Health, e-health, [176](#)

Health advocate, CanMEDS

Health Ethics, Law and Professionalism (HeLP) track, [207](#)

Health humanities, [237–238](#)

Health Resources and Systems Administration (HRSA), [249](#)

Health system imperatives, in longitudinal integrated clerkships, [104–105](#)

Healthcare

in digital age, [262–263](#)

quality, [232–234](#)

Healthcare system, in undergraduate curriculum, [17](#)

HeLP track, [207](#)

‘Hero-leader’, [430](#)

Hi fidelity simulation, communication and, [201](#)

Hidden curriculum, *See* [Curriculum](#)

‘Hidden incompetence’, [210](#)

Hippocratic Oath, [213](#)

'Homework', [70](#)

Hospital, *See* [Ward](#)

Human factors, in patient safety, [230](#)

Humanities, medical, [237](#), [374–375](#)

- considerations and challenges of, [241–242](#)

 - changing role of doctors, [242](#)

 - cultural and linguistic issues, [242](#)

 - realities of practice, [243](#)

 - sustainability, [241–242](#)

 - teachers, [241](#), [242b](#)

- curriculum structure for, [238–241](#)

 - arts based, [241](#)

 - assessment, [238–239](#)

 - compulsory or elective, [239–240](#)

 - content and delivery, [240](#)

 - e-learning, [241](#)

 - experiential learning, [241](#)

 - framework, [238](#), [239f](#)

 - integration, [239](#)

 - narrative based, [240–241](#)

 - outcomes-based approach to student learning (OBASL), [238](#), [240f](#)

- definition of, [237–238](#)

- medical education and, [237–238](#)

- trends, [237b](#)

Humour, attention and, [66–67](#)

Hybrid simulators, [115](#)

I

IMG, *See* [International medical graduate \(IMG\)](#)

Implicit leadership theories (ILTs), [431t](#)

Inclusive leadership, [431t](#)

Incompetence, hidden, [210](#)

Incorporate feedback cycles, in portfolios, [300](#)

Independent learning, [10](#), [119](#)

- characteristics of, [120–121](#)

- development of, [121](#)

- distance learning, [122–123](#)

 - apps, [122](#)

 - digital literacies, [123](#)

 - social media, [122–123](#)

 - trends, [123–124](#)

websites, [123](#)

importance of, [120](#)

learner control of learning, [120](#)

self-regulated learning, [121–122](#)
promoting the development, [122](#)

skills, [122](#)

Individualized learning, [131–132](#)

Inductive learning, [59](#)

Informal curriculum, in medical education, [174](#)

Informal learning, [59b](#), [61](#)

Informal mentoring, [364](#)

Information, [261–262](#)

additional sources of, patients and interprofessional colleagues as, [267–268](#)

analysis of, [266–267](#)

overload, [131](#)

retrieval of, [265–267](#)

ubiquitous

defining, [261](#)

effects of, [266f](#)

era of, medical education in, [261](#)

three key competencies in, [263–264](#)

triple jump exercise, [267f](#)

Infrastructure, digital technology, [171](#)

Innovative methods, fitting outcomes and, [209](#)

Inpatients, clinical teaching strategies for, [83–84](#)

Institutions and organisations

challenges of LICs for, [107](#)

culture, *See* [Culture](#)

in staff development, [355](#)

See also [Medical schools](#)

Instruction, computer-aided (in staff development), [353](#)

in staff development, [356–357](#)

Instructional objectives, learning outcomes and, [132](#)

Integrated longitudinal programmes, [358](#)

Integrated procedural performance instrument (IPPI), [116](#)

Integrated learning, [139](#)

assessment, [143–144](#)

causal networks, benefits, [142](#)

challenges to, [144](#)

- curricular/program, 140–141, 140^f
- definition, 139
- horizontal *versus* vertical, 141, 142^f
- rationale for, 140
- session level
 - course level *versus*, 142
 - strategies, 142–143

Integrated teaching, 10

Integration, medical humanities, 239

Integrative medicine, 249–250

- clerkships in, 247–249
- clinical years in, 247
- competencies for, 250^t
- experiential learning in, 246–247
- fellowship in, 250
- in graduate medical education, 249–250
- pre-clinical years in, 246
- residency in, 249–250
- in undergraduate medical education, 246–247

Integrative Medicine in Preventive Medicine Education (IMPriME), 249

Integrative Medicine in Residency (IMR), 249

Intensification, as element in simulation, 111

Interleaving, 103

Internationalization, 47

- aiming for, 50–52
- distant curricula, 49
- global physician, 49
- Organization for Economic Cooperation and Development, 48
- setting standards, 49–50
- trends and challenges, 50, 51^t

International medical graduate (IMG), 201–202

Interprofessional colleagues, as additional sources of information, 267–268

Interprofessional education (learning), 147

- accreditation, 149–151
- assessment in, 151–152
- collaborative practice, 148
- curriculum development in, 149, 150^t, 150^t
- definition of, 147
- evidence for the effectiveness, 148, 149^f

- faculty development for, [152](#)
- history of, [147–148](#)
- interprofessional collaborative practice (IPCP), [149](#)
- learning activities in, [151](#)
- outcomes in, [149–151](#)
- overcoming challenges in, [152–153](#)
- postqualification in, [152](#)

Interprofessional facilitations, [152](#)

Interprofessional learning, [10](#)

Interprofessional standardized patient exam, [247–248](#)

Intersectionality, [464–465](#)

Item response theory (IRT), [272](#)

J

James Cook University (JCU), [442](#)

Joint accreditation, [35–36](#)

Judgement tests

See also [Assessment\(s\)](#), [Self-assessment](#)

Just culture, establishment of, [231](#)

K

Key-feature approach questions, [285–286](#)

Knowledge, [261–262](#)

foundational, advanced and specialized, [265](#)

Knowledge cloud, [262–263](#)

Knowledge transfer (KT), [34–37](#), [34^f](#)

application, [35](#)

apprehension, [34](#)

practical implications, [35](#)

processing, [35](#)

transnationalization, [36](#)

L

Language, culture and, [201–202](#)

Large group, role play in, [198](#)

Layered analysis, problem-based learning (PBL), [156t](#)

Leader-member-exchange (LMX) theory, [431t](#)

Leadership, [429](#)

- accountability, [434](#)
- activism, [434](#)
- adaptive, *See* [Adaptive leadership](#)
- advocacy, [434](#)
- as context dependent, [432–433](#)
- leading groups and teams, [433](#)
- personal qualities and attributes, [430–432](#)
- practice, [430](#), [431t](#)
- systems perspective, [433–434](#)
- theory, [430](#), [431t](#)
- transformational, *See* [Transformational leadership](#)
- trends, [429b](#)

‘Leadership triad’, [429–430](#)

‘Learned’ curriculum, [8](#)

Learner-centred approach, [84–85](#)

Learner-centred learning environment, [445–446](#), [446f](#)

Learners, *See* [Student\(s\)](#)

Learning

- active, *See* [Active learning](#)
- adult, *See* [Adult learning](#)
- ambulatory care, *See* [Ambulatory care learning](#)
- assessment, *See* [Assessment\(s\)](#)
- collaborative, *See* [Collaborative learning](#)
- in community, *See* [Community](#)
- context, [305](#), [306f](#)
- distance, *See* [Distance learning/education](#)
- environment, *See* [Environment](#)
- feedback, *See* [Feedback](#)
- in groups, *See* [Groups](#)
- guidance, [194](#)
- imperatives, in longitudinal integrated clerkships, [103–104](#)
- independent, *See* [Independent learning](#)
- integrated, *See* [Integrated learning](#)
- interprofessional, *See* [Interprofessional education \(learning\)](#)
- in lectures, *See* [Lectures](#)
- peer-assisted

see Peer-assisted learning (PAL)

postgraduate, *See* [Postgraduate medical education \(PGME\)](#)

problem-based, *See* [Problem-based learning \(PBL\)](#)

self-directed (in staff development), [352–353](#)

in simulated environment, [109](#)

student-centred, *See* [Student-centred learning](#)

styles, [61–62](#)

task-based, *See* [Task-based learning \(TBL\)](#)

urban and rural communities, [91, 92f](#)

- adaptive expertise, [94](#)
- block rotations, [92–93](#)
- clinical decision making, [94](#)
- clinical learning, [95](#)
- collaborative learning, [95](#)
- community-based medical education, [91–92](#)
- community-engaged medical education, [92](#)
- examples, [96–97](#)
- generalism, [94](#)
- healthcare delivery complexity, [94–95](#)
- learning experiences, [95–96](#)
- patient-centred clinical method, [94b](#)
- patient-doctor relationship, [93](#)
- physician education, [98f, 99](#)
- research, [97–99](#)
- social and cultural dimensions, [93–94](#)
- teachers role, [96, 96, 96b](#)
See also [Coaching, Education, medical](#)

Learning activities, [164](#)

advance assignment, [164–165](#)

application exercise, [166–167](#)

instructor clarifications and appeals, [165–166](#)

readiness assurance test, [165](#)

self-directed learning, [167](#)

Learning health systems, [262](#)

Learning triad, [82–83](#)

Lectures, [65](#)

activity development, [70](#)

attention in, [66, 66b](#)

buss groups, [69–70](#)

effective uses of, [66b](#)

evaluation, [71, 71b](#)

flipped classroom, [70](#)

fostering engagement, [66–67](#)

hall, active learning in, [69–71](#)

low stakes writing assignment, [69](#)

- note check, [69](#)
- organizing, [67–68](#)
- out-of-class homework, [70](#)
- pros and cons of, [65–66](#)
- retention, promoting, [67](#), [67b](#)
- session, [70–71](#)
- teaching materials in, [68](#)
- think-pair-share, [69](#)

Linguistic issues, medical humanities, [242](#)

Logbooks, structured, [85](#)

- challenges of, [107](#)
- definition of, [102](#)
- development, [106–107](#)
- history of, [102–103](#)
- impact of, [106](#)
- model types of, [105](#)
 - generalist, [105](#)
 - multispecialty ‘streams’, [105–106](#)
- rationale, [103](#)
 - health system imperatives, [104–105](#)
 - learning imperatives, [103–104](#), [104f](#)
 - professional imperatives, [104](#)
 - societal imperatives, [105](#)

Low stakes writing assignment, [69](#)

M

Management, curriculum, [12–13](#)

Map, curriculum, [20](#)

Maria-Goeppert-Mayer Program, [466–467](#)

Marketing of staff development programmes, [357–358](#)

Massive Open Online Courses, [11](#)

Mastery test, [274](#)

Measurement theories, [271–272](#)

Medical education research, *See* [Research](#)

Medical humanities, *See* [Humanities, medical](#)

Medical records, [200](#)

- social accountability of
 - concept of, [437–439](#), [438b](#), [438t](#), [440b](#)
 - medical teachers comprehensive roles in, [440–441](#)

Medical school

- challenges, medical education, [3](#)
- COVID-19 pandemic
 - changes proposed or required after, [4–5](#)
 - trends, [3–4](#)
- social and behavioural sciences, [189](#)
 - active learning, [193](#)
 - assessment, [194–195](#)
 - community-based learning, [194](#)
 - cultural competency, [191](#)
 - discipline-specific curricula, [192](#)
 - global standards, quality improvement, [190f](#)
 - illness, [191](#)
 - implementation, [195](#)
 - importance of, [189–190](#)
 - interdisciplinary, [193](#)
 - learning guidance, [194](#)
 - learning opportunities, [193–194](#)
 - multidisciplinary, [192](#)
 - patient perspectives and behaviours, [191](#)
 - physician-patient interactions, [192](#)
 - physician role and behaviour, [192](#)
 - realistic about time, [194](#)
 - teaching design and delivery, [193](#)

Memorial University of Newfoundland (Canada), [441](#)

Mentoring and mentorship, [361](#)

- advising, [362](#)
- benefits of, [362](#), [363b](#)
- career development, [363](#)
- challenges in, [365](#)
- coach, [364](#)
- coaching, [362](#)
- collaboration, [362](#)
- Daloz model, [362–363](#), [363f](#)
- definition, [361](#)
- effective programme design, [365–366](#), [367b](#)
- evaluation, [366–367](#)
- feedback, [364](#)
- importance of, [362](#)
- networking, [363](#)
- portfolios and, [300–301](#)
- professional socialization, [363](#)
- role model, [362](#)
- roles of, [300–301](#), [363](#), [363b](#)
- sponsorship, [362](#)
- in staff development, [353–354](#)

- stages of, [365](#)
- support, [364](#), [364b](#)
- two-way relationship, [362](#)
- types of, [362](#), [364–365](#)

Metacognition, [9](#), [264–265](#)

Microethical challenges, hidden curriculum, [43](#)

Microskills, for students, [85](#)

Milestones, portfolio, [302–303](#), [302t](#)

Miller's levels of assessment (skills and competencies triangle/pyramid), [295](#)

Miller's Pyramid, [218](#)

Miller's Triangle, [318](#), [318f](#)

Mini clinical evaluation exercise (Mini-CEX), [293](#), [320–321](#), [455–456](#)

MIPLAN, clinical teaching, [84](#)

Mistreatment, wider systems, [373](#)

Mixed-methods reflection, medical education research, [460](#)

Mixed-methods research, [459–460](#)

Model for Improvement, health care quality, [232](#), [232f](#)

Modified Bloom's taxonomy, [69](#)

Monitoring progress, portfolio, [297](#)

Moral leadership, [431t](#)

Motivation

- faculty, [354](#)
- in lectures, [66](#)

Multispecialty 'streams' model LICs, [105–106](#)

Multiculturalism, and cultural pluralism, [206](#)

Multimedia learning, [171–172](#)

Multiple-choice questions (MCQs), [11](#), [283–284](#)

Multiple mentoring, [364](#)

Multiple mini-interviews, [412](#)

Multiple true-false questions, [284–285](#)

Multisource feedback (360-degree assessment), [152](#), [294](#), [320](#)

N

Narcissistic leadership, [431t](#)
Narrative information, portfolio, [301–302](#)
National University of Singapore Yong Loo Lin School of Medicine (NUS YLLSoM),
[207](#), [208f](#)
Needs, diverse, in staff development, [356](#)
Net generation, [175–176](#)
Norm-referenced score interpretation, [274](#)
Norming stage, small groups, [77](#)
Northern Ontario School of Medicine (NOSM), [440](#)
Note check, [69](#)

O

Objective assessments, [276](#)
Objective structured clinical examination (OSCE), [11](#), [209](#), [290–292](#), [292f](#), [455–456](#)
Objective Structured Long Case Examination Record (OSLER), [292](#)
Observation
 See also [Participant-observer inquiry](#)
 direct, of procedural skills, *See* [Direct observation of procedural skills \(DOPS\)](#)
Observer model, [86](#)
Online simulation resources, [171–172](#)
Ontological leadership, [431t](#)
Organ-System-Based Model, [18](#)
Organisations, *See* [Institutions and organisations](#)
OSCE, *See* [Objective structured clinical examination \(OSCE\)](#)
Out-of-class homework, [70](#)
Outcome-based education (OBE), [129](#), [129b](#)
 arguments for adopting, [130–132](#)
 accountability, [132](#)
 assessment of learner's progress and continuum of education, [131](#), [131f](#)
 attention to quality of care and neglected areas of competence, [130–131](#)
 problem of information overload, [131](#)
 student-centred and individualized learning, [131–132](#)
 clinical teaching, [85](#)
 implementation of, [132–134](#), [134–135](#), [135f](#)
 learning outcomes and instructional objectives of, [132](#)
 outcome-based curriculum, [134–135](#), [135f](#)
 outcome frameworks, [132–134](#), [133f](#), [133f](#), [134b](#)

myths about, [135–136](#)

from process to product, [129](#), [130f](#)

trend towards, [130](#)

Outcomes-based approach to student learning (OBASL), medical humanities, [238](#), [240f](#)

Outcomes (learning) frameworks, [132–134](#), [133f](#), [133f](#), [134b](#)

Outpatients, clinical teaching strategies for, [84–85](#)

P

PAL

see Peer-assisted learning (PAL)

Papadakis, Maxine, [213](#)

Parallel consulting, [107](#)

Parallel Rural Community Curriculum (PRCC), [102–103](#)

Parnassus Integrated Student Clinical Experiences (PISCES), [103](#)

Participant, single, role play by, [199](#)

Participant-observer inquiry, hidden curriculum, [42](#)

Participation, active, small groups, [74](#)

Patan Academy of Health Sciences (PAHS), community-based learning and education, [440](#)

Patient(s)

as additional sources of information, [267–268](#)

in clinical teaching, [82](#)

virtual, [171–172](#)

Patient-centred clinical method, [94b](#)

Patient-doctor relationship, [93](#)

Patient as educator, [377](#)

challenges, [381](#), [382b](#)

Doubleday Centre, [380](#)

educational value of, [379](#)

public involvement, [378](#)

medical programme accreditation, [378](#)

research opportunities, [382](#), [382b](#)

role of, [379–380](#), [380f](#), [381b](#)

six degrees of, [379–380](#), [380b](#)

spectrum of, [378–379](#)

training and preparation, [378](#)

Patient perspectives and behaviours, social and behavioural sciences, [191](#)

Patient safety, and quality of care, [229](#)

- educational programme for, challenges to, [234](#)
- healthcare quality, [232](#), [232f](#)
- introduction to, [230–232](#)
- just culture in, establishing, [231](#)
- learner assessment and evaluation, [234](#), [234t](#)
- learner integration, [231–232](#), [231f](#)
- learner participation, [230–231](#)
- physician professional development in, [232–233](#)
- teaching, [232–234](#)
- strategies for, [233–234](#)
- trends, [229b](#)

Peer

- coaching, in faculty development, [353](#)
- evaluation, small groups, [74](#)
- mentoring, [365](#)

Perceived usefulness, in portfolios, [299–300](#)

Performance

- assessment, [290–292](#)
- in workplace, [292–294](#)
- competence and, distinction and interchangeable use of terms, [289](#)
- time-efficient strategies for learning and, [85](#)
- and workplace assessment, [289](#)

Performance discourse, simulated patient methodology, [111–112](#)

Performing stage, small groups, [77](#)

Personal development, medical humanities and, [238](#)

PhD supervisor, portfolio, [301](#)

Phronesis, [215](#)

Physician-patient interactions, [192](#)

Physician role and behaviour, [192](#)

Planning

- individual learning, assessment being aware of purpose, [290](#)
- interprofessional education, [149](#), [150t](#)

Pluralism, cultural, [206–207](#)

Podcasting, [68](#)

Portfolios, [297](#)

- assessment of, [300–303](#), [302t](#)
- contents of, [297–299](#), [298f](#)
- electronic, [299](#)
- factors for, [299–300](#)
- narrative procedure, [301–302](#)
- objectives of, [297–299](#), [298f](#)
- thesis and project circle, [303](#)

Postgraduate medical education (PGME), [23](#)

- assessment, [27](#), [27b](#)
- curricular models, [26–27](#)
- education components of, [26–28](#)
- history and evolution, [24](#)
- key elements of, [24–26](#)
- local program governance, [25](#)
- models, [24](#), [24b](#)
- program coordinators, [25](#)
- program directors, [25](#)
- program oversight, [24–25](#)
- quality markers, [28](#), [28b](#)
- resident perspective, [28–29](#)
- residents roles, [26](#), [26b](#)
- selection and admission, [25](#)
- settings, clinical placements, [25](#)
- teachers, clinical supervisors, [26](#)
- teaching and learning, [27](#)

Preclinical learning environment, [446](#), [447f](#)

Preparation for medical practice, medical humanities and, [237–238](#)

Privacy, in digital professionalism, [217](#)

Problem-based learning (PBL), [10](#), [155](#)

- accreditation, [155](#)
- case-based learning, [158–159](#)
- contextualization and implementation, [159–160](#), [159t](#)
- layered analysis, [156t](#)
- philosophy of, [156–157](#)
- reflection, [160–161](#)
- shapes of, [158–160](#)
- small groups, [75](#)
- team-based learning, [158–159](#)
- techniques of, [157–158](#)
- theoretical principles of, [157](#)

- traditional perspective, 158
 - facilitators, 158
 - group learning, 158
 - problem, 158

Problem-Based Model, 18

Process, move to product from, 129, 130^f

Production discourse, simulated patient methodology, 111–112

Professional development, 202

Professional identity (PI), 238, 409–410

Professional imperatives, in longitudinal integrated clerkships, 104

Professional mini evaluation exercise (P-MEX), 320–321

Professionalism, 213, 213^b

- American Board of Internal Medicine (ABIM) and, 214

- assessment of, 217–218, 315

- how, 317–319

- tool for, 316, 318, 318^f

- when, 317

- assessors, training, 318

- blueprinting, 318

- clarity of purpose, 318

- clinical communication and, 202

- code of conduct, 317, 317^b

- consistent expectations and, 210–211

- continuum-a portfolio of, 321

- curriculum design, 317

- defining, 213–214, 317

- developing culture of, 215–216, 216^f

- digital, 176, 216–217

- framework for, 214–215

- purpose of assessment, 318

- Royal College of Physicians and, 214

- setting boundaries, 315–316

- social media, 217

- student engagement, 319

- tools for, 319, 319^t

Proficiency, in digital professionalism, 176

Programmatic assessment, 323

- curriculum metaphor, 325

- example, 329–330

- implementation of, 330

- pillars of, [325](#)
- principles of, [325](#), [326t](#)
- spider diagram, [329–330](#)
- traditional approach, [323–324](#)

Programmes (educational/degree)

- integrated, ambulatory care teaching, [88](#)
- mentoring, *See* [Mentoring and mentorship](#)
- patient safety and quality of care, [234](#)

Programmes, staff development

- designing, [355](#)
- effectiveness, [355](#)
- evaluation, [357–358](#)
- key content areas, [351–352](#)

Progress testing/assessment/monitoring, portfolios in, [297](#)

Project Professionalism, [214](#)

Project report, [303](#)

Projects, [297](#)

Proto-professionalism, [215](#), [216f](#)

Psychometric discourse, simulated patient methodology, [111–112](#)

Q

Qualitative research, [456–457](#), [458t](#)

Quality assurance, portfolio, [302](#)

Quality of care, patient safety and, [229](#)

- educational programme for, challenges to, [234](#)
- healthcare quality, [232](#), [232f](#)
- introduction to, [230–232](#)
- just culture in, establishing, [231](#)
- learner assessment and evaluation, [234](#), [234t](#)
- learner integration, [231–232](#), [231f](#)
- learner participation, [230–231](#)
- physician professional development in, [232–233](#)
- teaching, [232–234](#)
 - strategies for, [233–234](#)
- trends, [229b](#)

Quantitative research, [456–457](#), [458t](#)

Questions

- black medicine, [374](#)
- clinical, framing appropriate, [265–266](#)
- essay, [281–282](#)
- extended-matching, [285](#)
- format of, [279–280](#)
- formation of, information retrieval and, [265–267](#)
- key-feature approach, [285–286](#)
- multiple-choice, [283–284](#)
- multiple true-false, [284–285](#)
- script concordance test, [286](#)
- short answer open-ended, [280–281](#)
- true-false, [282–283](#)

R

Rating scales and systems

- global, *See* [Global rating scales](#)
- OSCE, [290](#)

Readiness Assurance Test (RAT), [70](#), [165](#)

Reading, [201](#)

Recruitment, staff developers, [357](#)

Reflection, [309–310](#), [309b](#), [469–470](#)

- discourse, simulated patient methodology, [111–112](#)
- foundational sciences, curriculum, [183](#), [184](#)
- in portfolios, [298](#)
- problem-based learning (PBL), [160–161](#)

Relational leadership, [431t](#)

Relative standards, [275](#)

Reliability, [290](#)

Report-back model, [86](#)

Re-presentation, as element in simulation, [110–111](#)

Reputation, in digital professionalism, [176](#)

Reputational issues, in digital professionalism, [217](#)

Research, [455–456](#)

- building capacity, [460–461](#)
- funding, [461–462](#)
- medical teachers and social accountability, [442–443](#)
- mixed-methods research, [459–460](#)

- quantitative and qualitative research, [456–457](#), [458t](#)
- reflection, [460](#)
- theory usage, [457–459](#)
- trends, [455b](#)

Residency, in integrative medicine, [249–250](#)

Response formats, in written assessments, [280–285](#)

- essay questions in, [281–282](#)
- multiple-choice questions in, [283–284](#)
- multiple true-false questions in, [284–285](#)
- short answer open-ended questions in, [280–281](#)
- true-false questions in, [282–283](#)

Responsibility, in digital professionalism, [176](#)

Retention, promoting, [67](#)

Role modelling, [375](#)

- professionalism, [215–216](#)

Role play, [198–199](#)

- formats for, [198–199](#)
- rationale of, [198](#)
- session, conducting a, [199](#)

Root Cause Analysis (RCA), [230–231](#)

Royal College of Physicians, professionalism and, [214](#)

Rural Physician Associate Program (RPAP), [102](#)

S

Safety, patient, [229](#)

Scholar, [343](#)

- characteristics, [346](#)
- definition, [343](#)
- history and etymology/origins, [344–345](#)
- scholarship of, [345–346](#), [345f](#)
- shaping process, [346](#)
- SoTL process, [348](#)

Sciences (basic), [19](#)

Score equivalence, [274–275](#)

Score interpretation, [274](#)

Scottish Doctor outcomes model, [132–134](#), [133f](#)

Script concordance test questions, [286](#)

Selection

as element in simulation, [110](#)

evidence, [411–412](#)

Iipseus instrument, [412](#)

multiple mini-interviews, [412](#)

scoring, [412](#)

Self-assessment, [276](#)

Self-awareness, [414](#)

Self-compassion, [372–373](#)

Self-directed learning (in staff development), [167](#), [352–353](#)

Self-regulated learning, [121–122](#)

promoting the development, [122](#)

Sequential procedure, use of, portfolio, [301](#)

Sequential simulation, [116](#)

Servant leadership, [431f](#)

Shadowing a junior doctor model, *See* [Apprenticeship/shadowing a junior doctor model](#)

Shapes, problem-based learning (PBL), [158–160](#)

Short answer open-ended questions, [280–281](#)

Simulated environment, learning in, [109](#)

Simulated patients, [109](#)

discourses of clinical competence, [111–112](#)

hybrid simulations, [112](#)

methodology

discourses of clinical competence, [111–112](#)

fundamental concepts in, [111](#)

and trends in medical education, [111](#)

patients' voices and, [112–113](#)

qualities of, [113](#)

scope of practice, [112](#)

supporting in role portrayal and feedback, [113–114](#)

Simulation

background, [110](#)

current and future trends of, [115–116](#)

defined, [109](#)

as design, [110–111](#)

distributed, [110](#)

sequential, [110](#)

technology, [114](#)

hybrid simulators, [115](#)

immersive simulators, [114–115](#)

physical models of, [114](#)

in 21st century, [116](#)

Simulators

hybrid, [115](#)

virtual reality, [114–115](#)

Single participant role play, [199](#)

Sitting-in model, [87](#)

Situational awareness, [231](#)

Situational judgement tests (SJTs), [320](#)

Situational leadership, [431t](#)

Skills

performance and competence terms, [289](#)

portfolios in assessing development, [298](#)

Small groups (learning in/teaching of), [73](#)

benefits of, [74–75](#)

characteristics, [74](#)

definition, [73–74](#)

effective approach, [76](#)

effective conduct, [76–78](#)

effective session, [76–77](#)

evaluation, [77–78](#), [78](#)

format of, [75](#)

instructional methods for, [75–76](#), [75b](#)

leading, [76](#)

role play, [198–199](#)

at the session, [77](#)

trends, [73b](#)

concept of, of medical schools, [437–439](#), [438b](#), [438t](#), [440b](#)

medical teachers and, [437b](#), [439–440](#)

comprehensive roles in, [440–441](#)

practical examples of, [441–442](#)

research in, [442–443](#)

trends, [438b](#)

SMART criteria, [423b](#)

Social Interdependence Theory (SIT), [73](#)

Social media

- distance learning, [122–123](#)
- educating faculty on, [217](#)
- guidance on use of, [217](#)

Social movement theory, [464–465](#)

Societal imperatives, in longitudinal integrated clerkships, [105](#)

Sociology, [40](#)

Southern Illinois University School of Medicine (USA), [442](#)

Spacing, [103](#)

SPICES model, [10](#), [10f](#)

Spider diagram, [329–330](#)

Spiral curriculum, [9](#), [9f](#)

Spiral learning, [209](#)

Staff developers, preparation, [355](#), [357](#)

Staff development, [351](#)

- clinical teaching, [88–89](#)
- common practices and challenges, [351–355](#)
- definition of, [351](#)
- frequently encountered challenges, [354–355](#)
- programmes
 - designing, [355](#)
 - effectiveness, [355](#)
 - evaluation, [357–358](#)
 - key content areas, [351–352](#)

Stakeholders, consultation with, [13](#)

Standard setting, [271](#)

Star performers, study of, [8](#)

Storming stage, small groups, [77](#)

Stress, [370–371](#)

- prevention and recovery, [371](#)

Structured logbooks, [85](#)

Student engagement (SE), [403](#)

- ASPIRE program, [407](#)
- benefits, [403](#)
- curriculum, [404–405](#)
- pitfalls, [407](#)
- stepwise approach, [405–407](#), [406f](#)
- theoretical framework, [404](#), [404f](#)

Student(s), [374](#)

- challenges of LICs for, [107](#)
- differences between teachers, [354](#)
- in digital technologies, [172](#)
- mistreatment, hidden curriculum, [43–44](#)
- and trainees
 - additional support, [397–398](#)
 - ‘diagnosis of deficits’ approach, [397i](#)
 - ‘formulation’ approach, [400f](#)
 - need of support, [396–397](#)
 - organizational strategies, [399b](#)
 - selection, [387](#)
 - ‘struggling’ learners, [396b](#), [397f](#), [399–401](#)
 - system issues, [398–401](#)

Students learning, [10](#), [57](#), [131–132](#)

- approaches and contexts, [62–63](#)
- assumptions, [57–58](#)
- community of practice, [61](#)
- critical self-reflection, [60](#)
- deductive, [59](#)
- deficiencies and mistakes, [60](#)
- direct and regulation, [60](#)
- group setting, [60–61](#)
- individual’s contextualized knowledge creation, [58–59](#)
- inductive, [59](#)
- informal learning, [59b](#), [61](#)
- internal changes, cognitive schema, [58](#)
- by mastering, [59](#)
- object of, [57–58](#)
- observable and measurable behavioural change, [58](#)
- patient care, [61](#)
- styles, [61–62](#)
- subject of, [58](#)
- theories and strategies, [59–61](#)

Study guides, clinical, [86](#)

Subjective assessments, [276](#)

Substantial equivalency, [36](#)

Summative assessment, [272](#)

- in interprofessional education, [152](#)

Supervising model, [87](#)

“Swiss Cheese” model, [231](#), [231f](#)

T

Task-based learning (TBL), [8](#)

‘Taught’ curriculum, [8](#)

Teachers

- clinical
 - appropriate knowledge of, [83](#)
 - attitudes of, [83](#)
 - seven roles of, for achieving good clinical teaching, [82b](#)
 - skills of, [82](#)
- curriculum, [419](#)
- difference between students and, [354](#)
- evaluation by, small group, [77–78](#)
- at Ghent University, [441](#)
- medical humanities and, [241](#), [242b](#)
- in outcome-based education, concerns of, [136](#)
- portfolio, [301](#)
- roles of, [335](#)
 - as an information provider and coach, [335–336](#)
 - assessor and diagnostician, [338–339](#)
 - curriculum developer and implementer, [337–338](#), [338f](#)
 - education programme, [335](#), [336f](#), [337t](#)
 - facilitator and mentor, [336–337](#)
 - manager and leader, [339–340](#)
 - professional, [341](#)
 - role model, [339](#), [339b](#)
 - scholar and researcher, [340](#)
 - urban and rural communities, [96](#), [96](#), [96b](#)
- as scholar, [343](#)
 - characteristics, [346](#)
 - definition, [343](#)
 - history and etymology/origins, [344–345](#)
 - scholarship of, [345–346](#), [345f](#)
 - shaping process, [346](#)
 - SoTL process, [348](#)
- and social accountability, [437](#), [437b](#)
 - comprehensive roles in, [440–441](#)
 - practical examples of, [441–442](#)
 - research in, [442–443](#)
 - trends, [438b](#)
- in staff development, focus on, [352](#)

Teaching

- clinical, *See* [Clinical teaching](#)
- compassion with, [373](#)
- experiences, [11](#)
- innovations, [184–185](#)
- methods on, choosing, [11](#)

small groups, [75](#)

Technology-enhanced learning environment, [449](#), [450b](#)

Team-based learning (TBL), [158–159](#), [163](#)

components of, [163–164](#)

definition, [163](#)

flipped-classroom, [163](#)

instructor wrap-up, [167–168](#)

learning activities, [164](#)

advance assignment, [164–165](#)

application exercise, [166–167](#)

instructor clarifications and appeals, [165–166](#)

readiness assurance test, [165](#)

self-directed learning, [167](#)

orientation, [164](#)

peer feedback and evaluation, [164](#)

team formation, [164](#)

Team formation, [164](#)

Theory, interprofessional education based on, [149](#)

Thesis, [303](#)

Three-circle framework, Dundee, [132](#)

Tomorrow's Doctors (1993), [130](#)

Tours Faculty of Medicine (France), [441](#)

Traditional approach, programmatic assessment, [323–324](#)

Traditional assessment systems, [324](#)

Training

in portfolios, of assessor, [301](#)

of teachers, *See* [Teachers](#)

Training ward, [86](#)

Trait theory, [431t](#)

Transactional leadership, [430](#), [431t](#)

Transformational leadership, [431t](#)

Triple jump exercise, in ubiquitous information, [267f](#)

True-false questions, [282–283](#)

Tutor(s)

for clinical teaching, [82–83](#)

model, [82–83](#)

U

Ubiquitous information

- defining, [261](#)
- effects of, [266f](#)
- era of, medical education in, [261](#)
- three key competencies in, [263–264](#)
- triple jump exercise, [267f](#)

Undergraduate curriculum, [15](#)

- annual reviews, [21](#)
- concepts in planning, [18–20](#)
- continuum, [15–16](#)
- critical components of, [18–21](#)
- curricular model of, [19–20](#)
- delivery of, [17](#)
- designing, [16](#)
- ethics, [207–209](#)
- financial and physical resources for, [21](#)
- integrative medicine, [246–247](#)
See also [Integrated learning](#)
- managing, [20](#)
- map, [20](#)
- mission, vision and goals of, [19](#), [19f](#)
- modern, [19](#)
- preparation of faculty for, [21](#)
- safe learning environment of, [21](#)
- scientific content, [19](#)
- shaping, [16–18](#)
- student performance, assessment of, [20–21](#)

United States Medical Licensing Examination (USMLE), [289](#)

- communication, professionalism and interaction, [202](#)

University of New Mexico School of Medicine (USA), [442](#)

V

Validity, in assessment, [290](#)

Validity theory, [273–274](#)

Value-based recruitment (VBR), [410](#)

Value-led moral leadership, [431t](#)

Values, [410–411](#)

Videocasting, [68](#)

Vignettes, clinical, [210](#)

W

Ward

managing learning in, [86](#)
See also [Clinical teaching](#)

rounds, *See* [Grand rounds](#)

Websites, distance learning, [123](#)

‘Wise men’ approach, [8](#)

Workarounds, [43](#)

Workplace, [289–290](#)

assessment of performance in, [292–294](#)

outstanding issues, [295](#)

Writing, academic, [201](#)

Written assessments, [279](#)

quality control of items, [280](#)

question format, [279–280](#)

response formats, [280–285](#)

essay questions, [281–282](#)

multiple-choice questions, [283–284](#)

multiple true-false questions, [284–285](#)

short answer open-ended questions, [280–281](#)

true-false questions, [282–283](#)

stimulus formats, [285–286](#)

trends, [279b](#)