Embracing standardisation and contextualisation in medical education

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CONTEXT The tensions that emerge between the universal and the local in a global world require continuous negotiation. However, in medical education, standardization and contextual diversity tend to operate as separate philosophies, with little attention to the interplay between them.

METHODS The authors synthesise the literature related to the intersections and resulting tensions between standardization and contextual diversity in medical education. In doing so, the authors analyze the interplay between these competing concepts in two domains of medical education (admissions and competency-based medical education), and provide concrete examples drawn from the literature.

RESULTS Standardization offers many rewards: its common articulations and assumptions promote patient safety, foster continuous quality improvement, and enable the spread of best practices. Standardization may also contribute to greater fairness, equity, reliability and validity in high stakes processes, and can provide stakeholders, including the public, with tangible reassurance and a sense of the stable and timeless. At the same time, contextual variation in medical education can afford myriad learning opportunities, and it can improve alignment between training and local workforce needs. The inevitable diversity of contexts for learning and practice renders any absolute standardization of programs, experiences, or outcomes an impossibility.

CONCLUSIONS The authors propose a number of ways to examine the interplay of contextual diversity and standardization and suggest three ways to move beyond an either/or stance. In reconciling the laudable goals of standardization and the realities of the innumerable contexts in which we train and deliver care, we are better positioned to design and deliver a medical education system that is globally responsible and locally engaged.

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INTRODUCTION

We live in a global world. We order goods online from distant lands, we regularly consume foods from around the world, and we can cross continents in a matter of hours. Globalisation depends upon the standardisation of the infrastructure and systems that it uses. However, its effects have also prompted a powerful push for greater differentiation between international, national and local cultures.[1] As a result, in a global world the tension that emerges between the universal and the local requires continual negotiation.

Medical education is not immune from this tension. One philosophy of medical education focuses on standardising all aspects of training in the interests of safer health care, more consistency in the quality of services available, and increasing mobility of physicians and trainees. An alternative outlook focuses instead on the degree and value of contextual diversity in training, often as a way of producing physicians who have been shaped by their training contexts,[2] who can adapt their practices to local concerns[3] and who choose to practise in underserved communities.[4] Both philosophies have merit, yet they deal with the concept of context in very different ways. In this paper, we strive for a clearer understanding of this contested space, we look to harness its productive potential in medical education and we embrace its tensions in proposing potential ways forward.

CONTEXTUALISATION AND STANDARDISATION

What exactly do these terms mean? 'Context' seems self-evident: as Einstein famously explained it is 'everything that isn't me'. And yet disciplines struggle to agree on a common definition. This is in part because we tend to acclimatise to our regular contexts, which renders them largely invisible to us, and in part because each and every context is unique, making it hard to describe or compare them consistently. Nevertheless, Bates and Ellaway identified six recurring patterns that can be used to describe and compare clinical training contexts.[5] *Patient patterns* include the kinds of patients and presentations encountered; *practice patterns* include the different approaches to clinical practice; *educational patterns* include the different approaches to teaching and learning and their parent educational programmes and institutions; *institutional patterns* include the structures and processes of health care institutions; *societal patterns* include a community's organisation, cultures, technologies and values; and *geographical patterns* include the physical nature of training locations.[5] These patterns overlap and interact with each other. They can change, slowly or in the blink of an eye, and different elements within each contextual pattern may change at different rates or in different ways.[6] We understand *context* to be a complex and unpredictable emergent property of these specific patterns, inseparable from any single health care interaction. Medical students, clinicians and patients are all situated within this ever-changing and unpredictable matrix, whose only constant defining characteristics are its fluidity and individuality.[7–10] This view of context provides a productive lens for health professions education and enables us to examine the interaction of contextual diversity with standardisation more closely.

'Standardisation' is an equally slippery concept to work with. The idea of standardisation emerged from socially collectivist and collaborative activities in governance, commerce and transportation, where shared standards afforded greater efficiency and accountability. For instance, increasingly standardised laws, weights and measures, money, timekeeping, and even musical tuning, enabled ever-larger numbers of people to work together in ever more productive ways. Standardisation, through the development of common standards and the necessity to conform to these standards, may be driven by political and economic agendas, or as in aviation, nuclear power and health care, by public safety. We can argue that much of our modern world both depends on and has been defined by standardisation. However, although we often welcome the convenience and efficiency of shared standards, some of us may also regret the disappearance of those very idiosyncratic contextual elements that make life more diverse and interesting.

Although some standards remain relatively unchanged over time, others, such as laws, change in response to shifting societal needs or values. Standards on their own do not lead to standardisation, they need to be communicated, disseminated and adopted.[11] However, standards adopted into different local contexts may be enacted differently. For instance, many 'standard' products such as McDonalds, Cadbury, Coca-Cola, Toyota and Netflix are re-engineered for different markets, creating multiple different 'standards' that

are contextually dependent.[12] Standards, then, are rarely applied in a uniform way; as standards are created, changed, operationalised and withdrawn, standardisation shifts and diversifies.[13]

In medical education, standards are set through consensus by accreditation organisations,[14–16] through evidence in peer-reviewed literature,[17] through national examinations,[18,19] through common competency frameworks,[20,21] through national or international committees (such as the Foundation for Advancement of International Medical Education and Research)[22] and through political processes (such as the Bologna Process).[23]

However, even as these standards have been developed and applied, there have also been moves towards increased diversity in medical education. These include the pursuit of medical student diversity,[24,25] the adoption of varying social missions,[26] the expansion of clinical training into new settings[27] and the adoption of different pedagogies (such as longitudinal integrated clerkships [LICs] and simulation).[28,29]

These diverging perspectives can result in a palpable yet underexplored tension between standardisation and contextual variability that plays out in many domains of medical education.[30,31] We illustrate this tension by examining two areas of medical education: medical school admissions and competency-based medical education. We selected these two areas as they reflect the authors' practical experiences with managing the interplay between processes of standardisation and diversity of contextualisation. We use these examples to explore the competing discourses and following this examination we synthesise our findings and suggest strategies to enable us to move forward productively in the face of competing philosophies.

MEDICAL SCHOOL ADMISSIONS AND TRAINING

Driven by concerns about justice, equity and potential liability, medical school admissions practices around the world have been moving towards standardising assessment criteria and processes for all applicants. The Undergraduate Medical and Health Science Admission Test (UMAT) in Australia,[32] the Graduate Medical School Admissions Test (GAMSAT) in the UK and Australia,[33] the United Kingdom Clinical Aptitude Test in the UK[34] and the Medical College Admissions Test in the USA and Canada[35] are all examples of standardised examinations for entry to medical school. The organisations that develop these instruments often highlight their fairness, relevance, validity and reliability[32,36,37] while promising to enable inclusion, to minimise gender, ethnic or religious bias and to ensure cultural fairness.[32–34] Applicants in some countries are also assessed on individual attributes[38] such as altruism, resilience and communication skills, often using interviews, written autobiographies or personal statements. The reliability of these processes has been questioned,[39] leading to the development of new instruments (such as situational awareness tests and multiple mini-interviews) that offer increasingly standardised approaches to assessing desired attributes[38,40–43] and using them to predict future performance, especially in clinical settings.[44]

However, standardisation has its limits, specifically with regards to medical school class diversity, achievement of social missions and student fit with diverse contexts of clinical training. Class diversity, enabled through the inclusion of certain groups of students, can be constrained by standardised admissions processes.[25,45,46] Class diversity is not just a 'nice to have', nor is it about social justice alone. Rather, class diversity provides one element of the context in which students learn. Class diversity creates a robust learning environment for students by exposing them to a broad array of ideas, experiences and viewpoints.[47,48] Medical students state that class diversity leads them to rethink their values and assumptions.[47] Furthermore, class diversity leads to a diverse workforce.[49]

Standardised admissions processes have also been shown to interfere with the achievement of medical schools' social missions, such as addressing rural and regional workforce shortages or the supply of family physicians and other generalists.[50–53] Academic criteria and individual attributes are not good predictors of who will select careers in rural and remote medicine or primary care. A different set of indicators must be considered during admission decisions in order to lead to intended long-term outcomes.[54]

A third, and as yet unexplored, way that standardised admissions processes intersect with diversity is in selecting students who can accommodate and adapt to diverse contexts of clinical training. Despite having a common entry point into a medical school, students typically encounter an array of different settings for their clinical learning. We should ask, therefore, whether

an admissions process that predicts success in one context is applicable to another.

Although some diversity of context during clinical training has always been present, there has been a dramatic diversification of training contexts over recent years. In order to achieve the social missions outlined above, a single medical school may now operate clinical training in very diverse contexts. In North America, some medical schools have implemented regional satellite campuses, far from the main campus, in which students may complete most or all of their medical training.[55] Other schools have extended clinical training into rural and regional settings. For instance, in Australia one-quarter of all medical students must complete at least one full year of training at a rural clinical school, far from their parent campus.[56] Growing numbers of medical students around the world are studying in longitudinal integrated clerkships (LICs) in rural settings.[57] This means that medical trainees encounter an ever-growing array of different workplace contexts to which they need to adapt in order to learn.

This diversification challenges a standardised admissions model. For instance, the likelihood that a class of relatively undifferentiated entering students will all succeed assumes that their clinical learning contexts are equivalent, and that the attributes needed to succeed in one clinical environment are the same as those needed in all of the others. Even within the same institution, different programmes highlight different learning processes[58] and may attract different students.[3] Different programmes may, in fact, require different kinds of students;[58,59] at the very least, they need students who are adaptable, resilient and flexible.[60,61]

The interplay between admissions standards that predict success in medical training and those that seek diversity in medical student classes and in workforce outcomes has led to extensive and ongoing debate about how to reconcile these two philosophies. One concrete proposal for uniting both approaches is holistic review of candidates, incorporating non-standardised information about candidates into standardised admissions procedures.[62] Holistic review is 'a flexible, individualized way of assessing an applicant's capabilities by which balanced consideration is given to experiences, attributes, and academic metrics and, when considered in combination, how the individual might contribute value as a medical student and physician'.[62] Holistic reviews can help to balance standardised testing with individual experience and attributes to better align admissions with a school's social mission or other context-related drivers.[54] Schools that have embraced holistic reviews in order to achieve social missions (such as ethnic diversity) have experienced an increase in class diversity.[63,64] Holistic review then is one example of the effort to navigate the tension between standardisation of criteria for admission and diversification of medical students. Although providing a model for negotiation between competing discourses, holistic review does not yet consider whether admitted students will thrive in diverse clinical training contexts.

A second approach emerging from the discussions about tensions in admissions is the development of new standardised instruments, for example to assess candidates' likelihood to contribute to a school's desired workforce contributions.[65] Although an applicant's ability to perceive and adapt to new circumstances may be every bit as important to their effective learning and eventual practice as their academic capabilities, no instrument as yet measures this ability. Situational judgement tests (SJTs) offer a measurement method designed to assess an applicant's judgement in situations encountered in the workplace in a manner that targets professional non-academic attributes rather than academic or clinical knowledge.[66] Such tests assess individuals' reactions to a number of hypothetical role-relevant scenarios, such as investigating and managing a patient in an under-resourced health care environment. However, such tests are complex to build and require a detailed understanding of the roles individuals may take.[67] We do not yet understand how and in response to what contextual triggers clinicians adjust their behaviours, so we would seem to be some distance from being able to construct a valid SJT for adaptability to be used in admissions.

COMPETENCY-BASED MEDICAL EDUCATION

Traditional models of medical education have been based on the time that learners are expected to spend working in different settings or engaging in particular activities. Competency-based medical education (CBME) turns that model on its head, as formal curricula are redefined in terms of the things learners must be able to do once they finish, rather than in terms of the experiences they must have, the time they must spend, or the contexts to

which they must be exposed.[68,69] Curriculum design in CBME, therefore, starts with desired outcomes and works backwards.[69] For instance, the Royal College of Physicians and Surgeons of Canada (RCPSC) has embarked on a multi-year plan to implement a CBME model of training across all of its 70+ specialty disciplines.[20] Within each discipline, curriculum planning begins with a national, consensus-building approach to define standardised outcomes, which residents will be expected to achieve independent of where they train.

Part of the appeal of an outcomes-driven model is its promise of greater public accountability.[68] By reducing the likelihood that physicians will enter unsupervised practice with gaps in their competence,[70] the CBME standardisation of outcomes represents a clear response from the medical education community to a societal imperative to improve the quality of health care and to address growing awareness of the frequency and consequences of medical errors.[71]

Standardisation of outcomes, although attractive in the accountability it appears to offer, nonetheless risks oversimplifying the complex nature of competence, potentially creating a false sense of security about the capability of graduates. This is because competence is, to some extent, inseparable from the context in which it has been developed; it is not an immutable attribute of an individual, but rather a socially constructed notion that may reveal its fragility when context shifts. Truly standardised outcomes may therefore be elusive or even impossible in any absolute sense. Even learners trained in the same context, using the same competency framework, may emerge as qualitatively different practitioners. Each clinical workplace context offers certain affordances: opportunities for learners to engage with and learn from the workplace,[72–75] whether that be patients, preceptors, health care systems or social conditions. Each individual trainee perceives the affordances they encounter in their own way[72,76] and engages with them in an individual trajectory across the landscape of practice.[77,78] Affordances can and do shift over time, yet they always arise from a 'contextual curriculum' specific to that one context in that one moment.[79,80] Furthermore, learners are active players in their contexts of training, possessing significant agency in determining how to engage with the affordances offered by their clinical workplace.[81] Context shapes experiences and thereby learning trajectories and learning processes, not in terms of time spent but in terms of development through meaningful experiences.

Competence, when viewed as something that is contextually defined, becomes 'a moving target'.[82] How, then, can we reconcile the demand for consistent, high-quality educational outcomes that serve the public good with this growing understanding of the elusiveness of competence? This tension need not be viewed as a threat to CBME; indeed, there have been calls for implementation with 'keen attention to context'[70] and for adaptation of core professional competencies to specific contexts.[83] For instance, the current focus on outcomes could be supplemented by a focus on learning process, on organising contexts and thereby experiences in such a way that certain outcomes (or a range of acceptable outcomes) are to be expected given the right guidance of the learner. Moreover, careful attention to the influence of contextual diversity may help to strengthen outcomes-guided curricula. Outcomes that leave context undefined are incomplete; outcomes must instead be defined so that learners must demonstrate their fundamental competence across a range of medical and social contexts. Given the wide diversity of clinical contexts described in the previous section, we must consider how context might meaningfully inform our outcome expectations, beyond just acknowledging the variability of clinical cases a learner might be expected to navigate.

Making room for contextual diversity may also be critical to the social accountability mission that standardisation of outcomes is trying to fulfil. Context shapes learner attitudes,[84] creates opportunities for professional identity development,[85] motivates learners,[86] influences career decisions and affords authentic opportunities for learners to apply their skills and knowledge.[84] Contextual variety in training can help to nurture a diverse workforce that is well equipped to provide care where and to whom it is needed. Although contextual diversity may disrupt an assumed, straightforward path to competence, it also develops *capability*, the ability to use competencies in novel as well as familiar situations.[87] Capability implies a capacity to deal with the unpredictable and complex situations that are far more emblematic of the real world of practice, a laudable outcome for any clinical training programme.[87] Finally, although some learning benefits (such as empathy for diverse populations or appreciation of medical practice challenges in different contexts) are not easily

measured, they are nevertheless a necessary part of humane, collegial and compassionate health care.

We argue therefore that implementation of CBME demands attention to context at every turn. When curricula are developed, we should ensure that the outcomes driving these curricula integrate the increasingly diverse and complex contexts that learners must navigate as they progress in their training. When programmes of assessment are enacted, we should collect robust observational data that illustrate how learners perform across a range of contexts and that support sophisticated entrustment decisions.[88] When CBME implementation rejects time as its organising principle, we should seek a new relationship with time in training: one in which time is viewed as enabling the accumulation of experience with the contextual variation needed to build learners' adaptability and capability.[89] Embedding context in the planning and execution of CBME should better prepare learners for the messiness and variability they will encounter in practice. By allowing contextual variation to inform CBME implementation, we, in fact, support rather than threaten standardisation's goal of safer care.

DISCUSSION

We have explored two examples of the interplay between standardisation and contextual diversity in medical education. We have considered the tensions that arise from different philosophies, offered concrete examples, and suggested possible approaches that engage both positions. Although we have focused our exploration on these two areas, the interplay between standardisation and contextual diversity is apparent across many other dimensions and domains of medical education. For example, although accreditation processes set standards for educational programmes, how those programmes implement and operationalise those standards is enacted differently according to context. Pedagogical approaches such as team-based learning 'morph' as they meet the local context of resources and policies and affordances during implementation.[31,90] Even an online teaching module will be used very differently according to the social and cultural context in which it is implemented.[91] Standards may stay the same, but they are not stable constructs when implemented; rather, as they are enacted locally they shift. This leads to the constant question of whether any specific enactment is 'true enough' to the standard.[12,13]

Standardisation brings benefits: its common articulations and assumptions can facilitate mobility, promote patient safety, drive continuous quality improvement and enable the diffusion of best practices. Standardisation can also help to embed principles of fairness, equity, reliability and validity in high-stakes processes, while reassuring stakeholders, including the public, about the quality of medical education as a whole. At the same time, contextual variation can lead to divergent learning opportunities, capability, better alignment of medical education with the affordances of local conditions, and a diverse workforce.

How then to move forward productively? We offer three approaches: theoretical, methodological and rhetorical. Embracing theoretical perspectives from other disciplines provides a range of lenses through which we can explore the interplay of standards with context. Sociomateriality offers one such perspective[92,93] as it reflects standards as being 'performed' by an assembled and interacting group of individuals, sociocultural norms and materials (including documents and competency frameworks) that together constitute a particular context.[13] A sociomaterialist perspective stresses that a standard is inevitably redefined and adapted in any context in which it is realised.[13,91] A standard then is the start of a conversation, a template to be 'tinkered with' and 'un-made'.[13] The materials introduced to a given context (such as standards) serve as templates but are also transformed through their use, and it is by understanding this transformation that sociomateriality can help to explore the interplay between standardisation and contextual diversity in medical education.

A second theoretical perspective we can use is that of pattern theory.[94] Originally developed in the context of architectural theory,[95] pattern theory considers phenomena in terms of the facets that can model them and the ways in which they can be or are combined. A pattern is a recurring and recognisable combination of certain facets, not all of which need to be present to be recognisable. Both standards and contexts can be modeled using a 'pattern language',[94,96] the discrete set of facets that in combination can reflect both their similarities and differences. In terms of standardisation and contextual diversity in medical education, pattern theory can help to model what are the recurring commonalities and what are the differences both in standards and the contexts in which they are realised.

Different methodological approaches can frame the interplay between context and the phenomenon under study. We have been encouraged to move beyond descriptive studies and justification studies to explanatory studies, asking 'Why does this work?'.[97] An extension to this approach asks 'In what contexts and under what circumstances does this work?', incorporating context into the framing of the research question. For example, realist approaches to research and evaluation allow us to understand the mechanisms by which interventions succeed or fail for specific individuals in specific contexts.[98,99] Similarly, case study methodologies examine how outcomes are generated in specific contexts and with interactions between specific individuals.[100] A multiple case study methodology enables us to examine how a phenomenon behaves differently in different contexts.[100] Such methodological approaches can shift attention to the interplay between the phenomenon being studied and the contexts in which it is embedded. In these research paradigms, the attention to context, without isolating it as the phenomenon under study, enables us to focus on the specific interplay between standardisation and context.

A third way forward is to reconsider how we report context in scholarly publications. Currently, a description of context is expected to be short and part of the methods section. We do not suggest that these descriptions need to be much longer, but there does need to be more reflexivity about context in academic writing. Qualitative research requires reflexivity on the part of the authors and research team; reflexivity creates transparency as to how the findings might be framed by the experiences and orientations of the members of the research team. Similarly, requiring reflexivity from the author team about how the context might have shaped or directed the findings would prompt more attention to context as well as better supporting those seeking to translate the findings into to their own context-bound circumstances.

CONCLUSIONS

Contextual diversity and standardisation are the warp and the weft of the fabric of medical education. Look at one side of the fabric and one set of threads shows. Turn the fabric over, and the other set predominates. Whichever side we examine, the colour and texture are the results of the interplay between the two threads. It is this interplay that produces the tensile strength of the fabric. The tension, if not properly understood or addressed, can result in dispute, denigration and even destruction of systems, irrespective of how much utility they may offer. However, when framed as deliberative, dialogic and democratic, tensions can also be creative and strengthening, helping to incorporate significant changes that permit a system to flexibly respond to a shifting environment. In recognising both the laudable goals of standardisation and the realities of the innumerable contexts in which we train and deliver care, we are better positioned to design and deliver a medical education system that is globally responsible and locally engaged.

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