Competency-based medical education: the discourse of infallibility

Victoria A Boyd,[1] Cynthia R Whitehead,[2,3,4] Patricia Thille,[2] Shiphra Ginsburg,[1,2,5] Ryan Brydges[1,2,6] & Ayelet Kuper[1,2,7]

BACKGROUND Over the last two decades, competency-based frameworks have been internationally adopted as the primary educational approach in medicine. Yet competency-based medical education (CBME) remains contested in the academic literature. We look broadly at the nature of this debate to explore how it may shape scholars' understanding of CBME, and its implications for medical education research and practice. In doing so, we deconstruct unarticulated discourses and assumptions embedded in the CBME literature.

METHODS We assembled an archive of literature focused on CBME. The archive dates from 1996, the publication year of the first CanMEDS Physician Competency Framework. We then conducted a Foucauldian critical discourse analysis (CDA) to delineate the dominant discourses underpinning the literature. CDA examines the intersections of language, social practices, knowledge and power relations to highlight how entrenched ways of thinking influence what can or cannot be said about a topic.

FINDINGS Detractors of CBME have advanced an array of conceptual critiques. Proponents have often responded with a recurring discursive strategy that minimises these critiques and deflects attention from the underlying concept of the competency-based approach. As part of this process, conceptual concerns are reframed as two practical problems: implementation and interpretation. Yet the assertion that these are the construct's primary concerns was often unsupported by empirical evidence. These practices contribute to a *discourse of infallibility of CBME*.

DISCUSSION In uncovering the discourse of infallibility, we explore how it can silence critical voices and hinder a rigorous examination of the competency-based approach. These discursive practices strengthen CBME by constructing it as infallible in the literature. We propose re-approaching the dialogue surrounding CBME as a starting point for empirical investigation, driven by the aim to broaden scholars' understanding of its design, development and implementation in medical education.

Medical Education 2018: 52: 45–57
doi: 10.1111/medu.13467

[1]Department of Medicine, University of Toronto, Toronto, Ontario, Canada
[2]Wilson Centre for Research in Education, Toronto, Ontario, Canada
[3]Women's College Hospital, Toronto, Ontario, Canada
[4]Department of Family and Community Medicine, University of Toronto, Toronto, Ontario, Canada
[5]Mount Sinai Hospital, Toronto, Ontario, Canada
[6]St. Michael's Hospital and University of Toronto, Toronto, Ontario, Canada
[7]Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada

Correspondence: Victoria A. Boyd, 1 King's College Circle Department of Medicine, University of Toronto, Toronto, Ontario M5S 1A8, Canada.
Tel: 416 473 5464; E-mail: victoria.boyd@utoronto.ca

INTRODUCTION

The introduction of competency-based medical education (CBME) in North America in the early 2000s initiated a shift in how scholars conceptualise education and assessment theory and practice. The creation of competency frameworks, such as the CanMEDS Physician Competency Framework[1] and the ACGME Outcomes Project,[2] marked a transition away from traditional time-based curricula. CBME is recognised as an outcomes-based approach to the design, implementation, assessment and evaluation of medical education using an organising framework of competencies.[3] This understanding of CBME stems from an older stream of educational theory, rooted in positivism and behaviourism, beginning in the late 1940s.[4] The competency movement was further propelled by the Edinburgh Declaration put forward by the World Federation for Medical Education. In particular, the third recommendation called for curricula that would ensure the achievement of professional competence, not merely the retention and recall of information.[5] Yet the history of the competency-based approach within medical education has been neither simple nor straightforward. Many scholars believe a focus on outcomes promises to produce better doctors and mitigate challenges faced in the evolving health care landscape.[6–9] Although its conceptual basis may make intuitive sense, concerns have been raised about the paucity of empirical evidence[4,10,11] supporting the competency-based approach and the 'revolutionary rhetoric' used to promote it.[12] Further, some researchers question the theoretical underpinnings of the model,[13–16] as well as the feasibility of its practical application in medicine.[11,17] Within the academic literature, instrumental arguments for and against CBME are well established.

We do not wish to join the valuable philosophical and practical contributions supporting or challenging the competency-based approach. Instead, we expand our lens to look broadly at the very nature of this scholarly dialogue. We attend to how this debate may shape scholars' understanding of CBME, and its implications for medical education research and practice. Further, we aim to deconstruct current perceptions of CBME by exploring the assumptions underpinning the literature. Given the international uptake of competency frameworks in medical education, it is crucial to step back and examine the assumptions driving this change.

We approach CBME as a social construction embedded in its political and historical context.[12,18] From this perspective, CBME (or any pedagogical approach) is built on a series of assumptions or set of preliminary beliefs about how to prepare medical students for their future practice as doctors. Such assumptions are generally unarticulated and taken for granted; uncovering them can serve several useful research purposes. For example, assumptions can highlight issues that may be a point of disagreement for different users of a construct. To an experimentalist, assumptions fundamental to the existence of a construct may provide testable hypotheses, the study of which can lead to refining or even dismantling the construct. To a critical theory scholar, uncovering such assumptions provides an entry point into examining the power relations that inform, justify and sustain particular educational practices. Explicitly identifying these assumptions is a key step in exploring a social construct like CBME.

The study of discourse helps researchers adopt the perspective necessary to locate and deconstruct educational assumptions considered natural or progressive. Discourse both reflects its social contexts and contributes to the social construction of phenomena.[19] Therefore, we undertook a critical discourse analysis of the academic literature focused on CBME. In doing so, we identify and examine discourses embedded in the texts, the assumptions legitimated by these discourses, and the social practices that help produce and maintain the discourses. In making visible these practices, we seek to shed light on how they inform the uptake of CBME, as well as the implications for its future design, development, and implementation.

METHODS

We conducted a Foucauldian critical discourse analysis[20] (CDA) of the CBME literature to delineate the dominant discourses underpinning the construct. Critical discourse analysis is a social science methodology used in many disciplines as a lens to explore the assumptions and presuppositions in a group of texts.[21,22] Although various forms of critical discourse analysis exist, a Foucauldian perspective seeks to identify relationships between discourse, social practices, knowledge and power relations. Michel Foucault theorised that social practices and their links to knowledge and power constrain the production and

use of discourse.[19] The term *discourse* refers to entrenched ways of thinking, speaking and acting.[23,24] Discourse manifests through written and spoken text;[25,26] it renders certain forms of text possible, and others less possible.[19] *Statements of truth* are 'the surface manifestation of deeper and more complex systems of discourse.'[12] Truth statements are recognised as legitimised assumptions regarding what is perceived as true or untrue and authorised or unauthorised in a given context.[12] Such statements establish *dividing practices* that make it possible to think, say and do certain things but not others.[27] Foucauldian CDA equips us with the tools to interrogate not only what is perceived as true, but how it becomes accepted as 'truth'.[28]

Foucault uses the term *resistance* to refer to alternative lines of reasoning that oppose dominant discourses.[29] A resistance discourse can be a vehicle for undermining entrenched ways of thinking and writing in order to enact social change. The study of a resistance discourse is often the key to unlocking the fundamental mechanics of a dominant discourse. Our use of a Foucauldian approach[20,25,26] allows us to problematise authorised truth statements in order to unearth and examine the boundaries between dominant and resistance discourses underpinning the CBME literature.

From a Foucauldian perspective, individuals' and organisations' use of authorised or resistance discourses is not necessarily intentional. Rather, such discourses derive from a certain social context at a particular time. The uptake (and production) of a discourse cannot be disentangled from its social, political and historical formations.[30,31] Therefore, as we trace the construction and use of discourses within the CBME literature, the reader must remember that particular ways of thinking or writing are not necessarily conscious or deliberate. Rather, such practices occur because they are allowed within the bounds of a dominant discourse, in a given time and place.

Search strategy and inclusion criteria

We assembled a comprehensive textual archive of articles focused on CBME in the medical education literature. Our starting point was a search strategy developed for a planned systematic review, on which the senior author (AK) of this paper is a collaborator, regarding the effectiveness of competency-based education across the health professions.[32] Given the two projects' fundamentally different epistemological approaches and purposes, there was consensus from both teams that the studies would generate completely different archives and findings. Researchers from both projects had ongoing discussions to ensure that there was no conceptual overlap. The component of the search strategy related to medical education yielded 1579 scholarly sources published between 1 January 1964 and 24 March 2016. Of the 1579 articles, we included in the archive only those published in the English language after 1996, the year of publication of the first CanMEDS Physician Competency Framework.[33] We focused solely on articles centred on the conceptual nature of CBME, rather than the application or assessment practices of competency-based curricula.

Given that CDA requires a broad lens to demonstrate the construction of discourses through a collection of texts, we considered all types of sources, including qualitative, quantitative and mixed methods empirical studies, position pieces, commentaries, reviews, editorials, and reports of consensus conferences. One research team member (VB) used the inclusion criteria to screen the titles and abstracts of each paper for eligibility. Seventy-one articles published prior to 1996 and 30 non-English language articles were discarded. Of the remaining set, full-text versions of 184 potentially relevant sources were screened; 78 met the inclusion criteria. As the analysis progressed, additional articles not captured by the search were identified in the reference lists of the original 78, generating 65 further articles. This strategy ensured we gathered key publications centred on CBME published after 1996 in the English language. Of the 143 articles included in the archive, 49 were empirical and 94 were non-empirical. This ratio aligns with the widely acknowledged reality that much of the literature examining the conceptual nature of CBME is non-empirical.[4,10,11] Appendix S1 (available online) maps the process by which articles were screened for inclusion and Appendix S2 lists all 143 sources included in the archive.

Foucauldian critical discourse analysis

Several broad research questions guided our analysis: (i) What are the dominant discourses underlying the CBME literature? (ii) How are the discourses used? (iii) What assumptions underpin these discourses?

Consistent with Foucauldian principles,[20,25,26] the analysis was a collaborative process advanced by iterative close readings of the texts and formative group discussions. One research team member (VB) read the full text of each article and coded recurring statements and concepts. A coding framework was established using an interpretive, data-driven approach, wherein related concepts were grouped as discursive patterns. The coding framework was an evolving entity propelled by continued exploration of the archive and regular team meetings. Once each text was coded, we examined how, and for what purposes, discursive trends were used in different types of scholarly articles. We then traced recurring arguments and shifts in these arguments[25,34] to explore the rationales used to legitimise these discursive practices. We also considered the ways in which recurrent arguments created a dialogue in the literature by supporting, contradicting or opposing each other. In doing so, we problematised how these practices arise from taken-for-granted discourses and truth statements. Finally, we considered the implications of these discourses for the future of medical education research and practice. The analysis was organised using Nvivo qualitative analysis software (QSR International, Doncaster, Victoria, Australia).

FINDINGS

Within the scholarly literature, which contains many genres and perspectives, most authors recognise the conceptual nature of CBME as an outcomes-based approach to the design, implementation and assessment of medical education curricula using a structuring framework of competencies.[3] Competencies are predominantly understood as observable and measurable abilities that, when actively integrated in practice, constitute physician competence.[3] Nevertheless, not all authors accept the conceptual premise underlying competency frameworks, nor their implementation in medical education. The literature is characterised by a visible divide between texts for and against CBME. To identify the discourses underpinning the literature, we traced these arguments and the resulting 'dialogue'.

A discursive 'dialogue' underpinning the CBME literature

Detractors of CBME present a number of critiques questioning the conceptual nature of the approach. Collectively, these critiques establish a resistance discourse that challenges the theoretical underpinnings of competency frameworks. Table 1 outlines the key critiques contributing to the resistance discourse. Proponents often counter these arguments by drawing on two repeated assertions: (i) CBME is difficult to implement and (ii) misunderstanding CBME is a barrier to implementation. These interrelated assertions refer to how the competency-based approach is both understood and actualised in medical education. The statements emphasise the challenges of successfully operationalising the theory of CBME in practice; they are built on the assumption that if issues arise, those involved are the source of the problem, not CBME itself. Although the obstacles associated with implementation and interpretation are valid concerns and imperative topics of inquiry, the repeated use of these assertions functions as a discursive strategy with broader implications for the boundaries of thought and speech. As we will demonstrate using excerpts from the literature, this rhetoric reduces conceptual critiques to matters of poor implementation or misunderstanding, and, consequently, deflects attention away from the basis of CBME.

Tracing the 'dialogue' through the literature: four examples

We present four representative examples that each highlight a pattern found in a broader range of literature. The following examples illustrate some of the most direct instances of the 'dialogue', wherein an article explicitly references and responds to a critique of CBME. We structure each example by first outlining the key critiques made in a text critical of the approach, and then showing how those critiques are addressed in a text supportive of the approach. In Foucauldian CDA, written or spoken text is the source of data. Thus, in keeping with the methodology, we share our findings through the use of quotations from the archive.

The first representative article[13] challenges the conceptual underpinnings of CBME by rejecting the practice of engaging in 'professional education based upon an inappropriate epistemology of competency', in which other forms of learning discourse are unable to bring their insights. The text cautions that this practice 'runs the serious risk of negating a deep and reflective engagement with a professional practicum'. Further, the article questions the behaviourist assumptions supporting CBME, suggesting they 'limit reflection, intuition,

experience, and higher order competency necessary for expert, holistic, or well-developed practice'. With regards to assessment, the article warns of only asking 'questions related to those things that may be more easily measured'. It extends this argument to suggest objective measurements cannot capture all the abilities we are interested in, such as higher-level competence.

In directly referencing this article, a second text[35] questions the ongoing CBME debate by asking, 'do these two groups of authors fundamentally disagree, or is there misunderstanding because they speak a different language when it comes to defining competency? It seems time to take a closer look at the confusion about competence terminology'. This excerpt reduces the arguments of the former article to a matter of misunderstanding caused by confusion over the language of competence. It suggests the construct being critiqued is not truly CBME, but a misinterpreted imitation. This assertion functions as a discursive strategy deflecting critical attention away from the conceptual premise of CBME.

A third paper[14] from the archive questions the core assumptions of CBME by targeting its behaviourist underpinnings. Behaviourist theories, transposed into medical education, tend to reduce holistic expertise to a 'series of discrete tasks' and ignore the connections that make these tasks 'a purposeful whole'. The text explains that the 'concept of competency is useless for assessing the education of the professional' because it 'fails to address the most important things about a physician'. This line of reasoning rejects objective assessments, stating 'there are no objective criteria by which we may determine someone's competency. [...] In all cases, when closely examined, the subjective element of the competent judge is always present'. The paper concludes by suggesting that medicine is a moral pursuit and the objective, action-focused competency model cannot embody this view.

A responding paper[36] quotes the previous text and replies by stating, the argument 'resonates with others who experience the practice of competence-based training as checking boxes on checklists rather than assessing the outcome of training in preparation for practice'. By distinguishing the practice of checking boxes from CBME, this quotation recasts the critiques of the former paper as an issue of poor implementation. This rhetoric suggests this version of CBME is not reflective of the 'true' approach. In subsuming behaviourist critiques as a problem of operationalising competency frameworks in practice, this discursive strategy effectively buffers the approach from critical appraisal.

Another text in the archive, a review[15] of existing literature on CBME, intends to evaluate the role of competency frameworks in medical education by discussing their strengths and limitations. The text summarises the perceived benefits and pitfalls by stating, 'the competency-based approach potentially leads to individualised flexible training, transparent standards, and increased public accountability. If applied inappropriately, it can also result in demotivation, focus on minimal acceptable standards, increased administrative burden, and a

Table 1 Key conceptual critiques of competency-based medical education found in the archive

Epistemological critiques			**Behaviourist critiques**			
Competence is socially constructed and reflective of dominant values and power relations	The learning process is as important as the outcomes	Competence is not solely individual, but also collective	Competence cannot be broken down into a series of discrete competencies	It is not possible to identify and define all competencies necessary to be a competent physician	Not all aspects of competence are observable and measurable	Measurable pieces of performance cannot constitute the skill and ability of a competent physician

reduction in the educational content.' The review concludes by suggesting, 'we should be cautious of applying the competency-based approach universally unless robustly defined higher order competencies are available'.

A corresponding commentary[37] directly responds to this review by noting the 'controversy over the competency-based approach [. . .] centres on a lack of consensus over what the term means'. The commentary reduces the theoretical dialogue to 'a fruitless debate about the meaning of competency-based education [which] is likely to detract from the real challenges in the next decade'. In using the assertion that a multiplicity of definitions prohibits implementation, these quotations position CBME and 'the reductionist approach to competence' as two distinct constructs. This discursive strategy reduces the concerns expressed within the review to a matter of misunderstanding and distances CBME from the reductionist critique by claiming the construct in question is a wrongly interpreted version. Again, this rhetoric directs attention away from the core nature of CBME.

The final example is drawn from a systematic review[16] of published evidence on competency-based assessment, which focuses on the behaviourist basis underpinning these assessment practices. The systematic review finds that the 'literature to date has not yielded any method that can assess the six ACGME general competencies as independent constructs'. Rather, most competency-based assessments likely measure either a single construct or multiple constructs that do not clearly map onto the ACGME framework. The study concludes by stating, if the 'six core competencies cannot be measured independently of one another, there [is] little practical utility in specifying them as independent criteria of competence'.

In a responding article[38] aiming to refute the findings of the systematic review, the text acknowledges critiques regarding the risks of 'anatomizing clinical competence', but focuses on responding to 'the nihilistic din that the instruments currently available are inadequate for evaluating residents'. The text reads, 'the biggest problem in evaluating competencies is, in our opinion, not the lack of adequate assessment instruments but, rather, the inconsistent use and interpretation of those available by unskilled faculty. We do not make this claim pejoratively. Nor do we fail to recognise the commitment and effort of faculty'. In this quotation, the evidence-based critique of the previous study is subsumed by the rhetoric of implementation and interpretation. The core nature of CBME is shielded from critical appraisal because faculty members are positioned as the source of the problem, rather than CBME itself.

Examining the evidence supporting the discursive strategy for CBME

After tracing the 'dialogue' between critical and supportive texts, we took a step back to explore the origins and reproduction of the discursive strategy in the literature. To do so, we examined the references cited whenever the assertions regarding implementation and interpretation were present in the archive. We found these assertions were predominantly raised in non-empirical position pieces and commentaries. The statements were consistently unsupported by empirical evidence. They were either unreferenced or supported by citations of other position pieces and commentaries, except for a few instances wherein literature reviews were cited specifically as evidence for the plurality of definitions of CBME. Figure 1 maps these referencing patterns. Although there is a growing body of literature empirically examining the challenges associated with implementation,[39–43] this research was not used as evidentiary support. Limitations imposed by journals on the number of words or references per article may, in part, play a role in the paucity of citations. Nevertheless, using unreferenced claims to dismiss a multifaceted resistance discourse is problematic. The texts are situated in an evidence-based paradigm by insisting conceptual critiques lack evidence, yet they neglect to cite evidence themselves. Based on referencing patterns, the rhetorical claim that concerns related to CBME are the result of implementation or interpretation is simply that: rhetoric, unsupported by empirical evidence. This practice is a key feature of the discursive dialogue underpinning the CBME literature.

Examining the evidence supporting the resistance critiques of CBME

After mapping the evidence behind the discursive strategy, we turned our attention to the evidence underpinning resistance critiques of CBME. These arguments were predominantly rooted in an analysis of the epistemological and theoretical basis of competency frameworks. We found that each of the 33 articles in the archive that contributed to

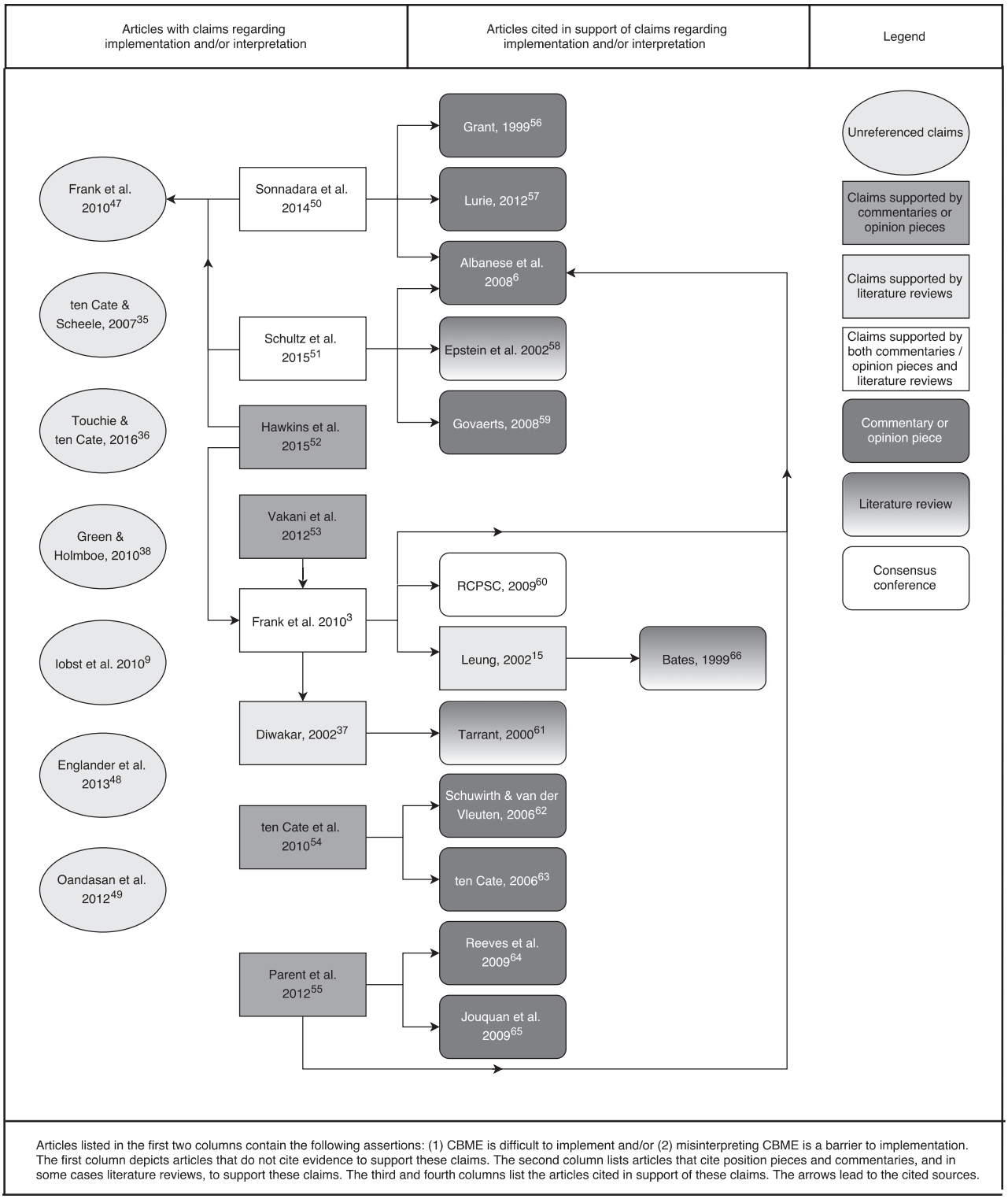

Figure 1 Analysis of references cited when assertions regarding implementation and interpretation were present in the archive

the resistance discourse cited six to 10 references in support of a key argument. Although these critiques were not usually supported with references to specific empirical studies, they drew from a different type of evidence: longstanding scholarly conversations and well-established

conceptual theories about competency-based education. This research reflects a long history of consideration of the approach outside the field of medicine, stemming from disciplines such as philosophy, psychology, sociology, history and education. This body of knowledge, which spans seven decades, was leveraged predominantly by the resistance discourse. Table 2 outlines a selection of exemplar publications drawn from the range of theoretical literature cited in support of epistemological and behaviourist critiques of CBME in the archive.

DISCUSSION

We conducted a Foucauldian CDA to explore how CBME has been imbued with discursive power.

Table 2 Examples of references cited in support of epistemological and behaviourist critiques of competency-based medical education in the archive

Epistemological critiques

Barnett R. The Limits of Competence: Knowledge, Higher Education and Society. Buckingham, UK: Society for Research into Higher Education & Open University; 1994.[67] *

Elliott J. Competency based training and the education of professions—Is a happy marriage possible? Buckingham: Open University Press; 1991.[68]

Eraut M. Developing professional knowledge and competence. London: Falmer Press; 1994.[69] *

Grundy S. Curriculum: Product or Praxis. London: Routledge Falmer; 1987.[70]

Lave J, Wenger E. Situated learning. Legitimate peripheral participation. Cambridge: Cambridge University Press; 1991.[71]

Polanyi M. Personal knowledge: Towards a post-critical philosophy. Chicago: University of Chicago Press; 1958.[72] *

Schon DA. The Reflective Practitioner. Aldershot, UK: Arena Books; 1991.[73] *

Skilbeck M. Ideological education theories. In: Skilbeck M, ed. Curriculum Design and Development, Course E203, Unit 3. Buckingham: Open University Press; 1976.[74]

Thornton T. Tacit knowledge as the unifying factor in evidence-based medicine and clinical judgment. Philos Ethics Humanit Med. 2006;1(2):1–10.[75] *

Wagner RK, Wagner SRJ. Practical intelligence in real-world pursuits: The role of tacit knowledge. J Pers Soc Psychol. 1985;49:436–58.[76] *

Wenger E. Communities of practice. Learning, meaning and identity. Cambridge: Cambridge University Press; 1998.[77]

Behaviourist critiques

Arnold L. Assessing professional behavior: Yesterday, today, and tomorrow. Acad Med. 2002;77:502–515.[78] *

Bloom BS. Taxonomy of educational objectives. Handbook I: Cognitive domain. New York: David McKay Company; 1956.[79]

Hodkinson P., Issitt, M. The challenge of competence: Professionalism though vocational education and training. London: Cassell; 1995.[80]

Hyland T. Competence, knowledge and education. Journal of Philosophy of Education. 1993;27(1): 57–68.[81]

Hyland T. Competence, education and NVQs: Dissenting perspectives. London: Cassell; 1994.[82]

Mansfield B. Competence and standards. In: Burke JW, ed. Competency based education and training. Lewes: Falmer Press; 1989.[83] *

Mitchell L, Wolf A. Understanding the place of knowledge and understanding in a competence based approach. In: Fennel E, ed. Development of assemble standards for national certification. Sheffield: Employment Department; 1991. 25–9.[84] *

Pearson AT. The competency concept. Educ Stud. 1980; 11(2):145–52.[85] *

Skinner BF. Walden two. New York: Macmillan Publishers; 1976.[86] *

Stenhouse L. An introduction to curriculum research and development. London: Heinemann; 1986.[87]

Tyler RW. Basic principles of curriculum and instruction. Chicago: The University of Chicago Press; 1949.[88]

Table 2 outlines a selection of exemplar references cited in articles from the archive that contributed to the resistance discourse. These articles draw from a large body of literature originating from a range of fields, including philosophy, psychology, sociology, history, education and medicine. This collection of citations illustrates that the evidence underpinning epistemological and behaviourist critiques stems from theoretical literature spanning multiple decades and disciplines.
* References cited by at least one of the four texts[13–16] shared as examples in the Findings. These references were also cited by other texts in the archive.

Moving through the textual archive, it became clear that a resistance discourse has advanced an array of conceptual critiques related to CBME. The CBME discourse has often responded to these, not with evidence, but with a clear discursive strategy that minimises these critiques and deflects attention from the underlying concept of competency frameworks. As part of this process, concerns related to CBME are attributed to two practical problems: implementation and interpretation. We argue this process contributes to a *discourse of infallibility of CBME*.

The discourse of infallibility of CBME

In reframing conceptual critiques as matters of implementation or interpretation, the discourse of infallibility establishes a discursive buffer that shields CBME's core assumptions from negative appraisal. This practice silences critical voices and hinders a rigorous examination of the competency-based approach. In this way, the discourse of infallibility strengthens CBME by constructing it as a 'truth' that cannot be questioned. As such, the competency-based approach comes to be perceived as a rational and inevitable advancement in medical education. Pinpointing the constructed and rhetorical nature of CBME, as well as how it comes to be understood as 'true', allows us to problematise unsupported claims; it also highlights such practices of critical analysis as a fundamental responsibility of medical educators and researchers.[28]

Authorised and unauthorised critiques of CBME

CBME, like any social construct, is a product of 'power and knowledge relationships founded on a series of repeated and legitimised statements'.[26] Tracing the discourse of infallibility uncovers how it is propelled by a discursive strategy used in the 'dialogue' between texts critical and supportive of CBME, and how it operates as a legitimised statement of truth. From this perspective, it becomes clear which lines of reasoning are perceived as true or untrue, legitimate or illegitimate, and authorised or unauthorised in the CBME literature. The discourse of infallibility positions implementation and interpretation as both legitimate and *legitimated* concerns related to the theory and practice of competency frameworks. Yet other defensible concerns, particularly conceptual inquiry grounded in epistemological and behaviourist issues,[13–16] have not been legitimated within these discursive boundaries. In keeping with Foucault's nomenclature of authorised truth statements, these forms of criticism are therefore *unauthorised* within the bounds of the discourse of infallibility. Mapping the predominance of a particular statement of truth unearths a clear distinction between critiques of CBME that are legitimate and authorised, and critiques that are legitimate but unauthorised.

The sharp division between authorised and unauthorised criticism illustrates the power of a truth statement to define the boundaries of what can and cannot be said about CBME. It is through this power dynamic that authorised critiques have the ability to silence, or simply ignore, alternative views. These discursive boundaries contribute to the dismissal of epistemological and behaviourist concerns advanced by the resistance discourse, leaving them largely unaddressed in the literature. This disregarded body of work raises valid arguments that rigorously question the foundational tenets of CBME,[13–16] as well as the paucity of evidence supporting the paradigm shift.[4,10,11] Such questioning is essential to understand whether and how CBME will realise its stated promise and potential. Thus, CBME can only be critiqued within the confines produced by the statement of truth and upheld by the discourse of infallibility. This dividing practice 'shapes and limits the ways individuals and institutions can think, speak, and conduct themselves'.[24] Over time, this causes certain forms of knowledge and ways of knowing to become more acceptable, and others less so.[44] These boundaries make possible the very existence of specific institutions. From this perspective, CBME is made possible by the recurring claim that the construct's primary issues are its practical implementation and interpretation.

The same dividing practices that shape what can and cannot be said about CBME also inform who can and cannot say it. Socially constructed constraints on thought and speech invest certain groups of individuals with power, which ultimately determines who has the authority to write or speak about CBME. Those whose scholarly opinions align with the dominant discourse are accorded legitimacy, whereas other voices are suppressed. Further, individuals' positions within the structure of medical education can influence what they are able to say, and on what grounds they may say it.[45] It is perhaps not surprising, when considering this dynamic from a Foucauldian perspective, that many authors using the discourse of infallibility are affiliated with organisations that promote the

competency-based approach and are invested in its uptake in medical education. Although this group does not necessarily strive to maintain the distinction between authorised and unauthorised, the discourse influences the group's thinking and writing such that this undercurrent is perpetuated, whether consciously or not. Over time, these power structures have become normalised in the medical education literature. The bibliographic analysis in Figure 1 illustrates the result of this normalisation process. It indicates that the assertion *implementation and interpretation are the only legitimate concerns related to CBME* is now so taken for granted it does not require supporting empirical evidence in academic publications.

The discourse of infallibility as a faux resistance

According to Foucault, power often manifests in the form of a strategy rather than a possession, diffused throughout a complex system of discourse.[46] As both legitimate and legitimated concerns related to the operationalisation of competency frameworks, implementation and interpretation act as an outlet through which users of CBME can channel potential frustration. The authorised critiques provide users with a scapegoat to bear the blame when challenges arise in the sustained practice of CBME. In this way, implementation and interpretation appear to be, and partially function as, a resistance discourse. However, these seemingly negative proclamations operate within the discourse of infallibility to protect CBME by distracting users from more substantial issues. The authorised critiques are a *faux* resistance in that they seem to be implicated in an opposing discourse, yet instead strengthen and preserve the notion that CBME is infallible. This apparent contradiction has immense productivity in increasing the dominance of CBME. Disguised as a form of opposition, the discourse of infallibility can operate unarticulated and unrecognised in the literature. Thus, the discourse is perpetuated by the way its faux resistance façade prevents the concept of CBME from being questioned in a robust, empirical manner.

IMPLICATIONS FOR MEDICAL EDUCATION

In discussing the production and propagation of the discourse of infallibility, we do not suggest it is used consciously or intentionally. Rather, Foucauldian CDA illuminates how 'individuals are embedded in the discourses of their times', meaning 'the social construction and uptake of language cannot be divorced from its context, nor can unintended effects be predicted in advance'.[31] Similarly, we do not argue that individuals implicated in discourses actively associate their work with either dominant or resistant ways of thinking. Indeed, CDA can over-emphasise the dichotomy between dominant and resistance discourses when making visible the integral link between language and power. Nevertheless, CDA reminds us that language cannot be considered neutral because it is inextricably tied to its social, political and historical formations.[31] In examining the intersections between discourse, practices and power, CDA does not address the local level. Rather, it attends to the societal level by considering how and why groups of individuals are implicated in taken-for-granted practices. We suggest, then, that individuals' use of the discourse of infallibility or the opposing resistance is not a matter of intent, but a direct consequence of their engaging with medical education research and practice during the conception, development and implementation of the competency-based approach.

In deconstructing the 'dialogue' underpinning the CBME literature, we do not claim to operate outside the bounds of these discourses. Like all individuals, our thinking and writing are inevitably tied to the discursive structures of our context and time. We sought distance from these institutional influences by forming a team with varying positions in relation to CBME, including two members (VB and PT) unfamiliar with the approach prior to the onset of the study. This purposeful decision helped de-naturalise practices that may seem normal to individuals steeped in certain discourses on a more continual basis. Although we endeavoured to maintain a reflexive consideration of our own positionalities throughout this study, we cannot entirely disentangle ourselves from the discourses within which we operate. CDA offers a strong conceptual and methodological framework to guide this process, but it too rests on a set of assumptions that serve as a basis for understanding the world. This research is inevitably implicated in those assumptions.

Our study highlights how important lines of inquiry were often unaddressed in the literature. This body of work raised legitimate arguments questioning the theory and practice of competency frameworks in medical education. These arguments, although often not based in empirical research, were advanced by long-standing and well-developed theoretical consideration. Moving forward, we

propose reframing the unauthorised critiques as valid research questions. Using past knowledge from other fields as a foundation, the critiques offer valuable entry points for rigorous examinations of the assumptions underpinning the competency-based approach in medical education. Creating a space that attends to varying perspectives and reflects on the assumptions grounding these perceptions is crucial to advancing the scholarly conversations surrounding CBME. As a research community, engaging in open and reflective dialogues that productively question the competency-based approach may allow us to strengthen our understanding of its design, development and implementation in medical education.

CONCLUSION

Our use of Foucauldian CDA illuminates how CBME is made possible by a complex system of discourse propelled by a recurring discursive strategy. In uncovering the discourse of infallibility, we make visible the means by which the discourse is sanctioned, the types of criticism of CBME that are accepted as true, and the social practices that extinguish unauthorised ways of thinking. In positioning CBME as infallible, the discourse can prevent a rigorous examination of the approach. We suggest re-approaching the conversations surrounding CBME as starting points for empirical inquiry, driven by the aim to collectively advance medical education research and practice.

Contributors: VB contributed to the data collection and analysis, and to the drafting and revising of the paper. AK and CW contributed to the methodological and conceptual design, the analysis and interpretation of the data, and the critical revision of the paper. PT, SG and RB contributed to the analysis and interpretation of the data, and to the revision of the paper. All authors approved the final manuscript for publication.
Acknowledgements: None.
Funding: University of Toronto Department of Medicine Integrating Challenge Grant.
Conflicts of interest: None.
Ethical approval: Not applicable.

REFERENCES

1 Frank JR, ed. The CanMEDS 2005 physician competency framework. Better standards. Better physicians. Better care. Ottawa: The Royal College of Physicians and Surgeons of Canada; 2005.
2 Accreditation Council for Graduate Medical Education (ACGME). Outcome Project. Chicago: ACGME. 2009.
3 Frank JR, Snell LS, Cate OT, Holmboe ES, Carraccio C, Swing SR, *et al.* Competency-based medical education: theory to practice. *Med Teach* 2010;**32** (8):638–45.
4 Morcke AM, Dornan T, Eika B. Outcome (competency) based education: an exploration of its origins, theoretical basis, and empirical evidence. *Adv Health Sci Educ Theory Pract* 2013;**18** (4):851–63.
5 The Edinburgh Declaration. *Med Educ* 1988;**22** (5):481.
6 Albanese M, Mejicano G, Gruppen L. Perspective: competency-based medical education: a defence against the four horsemen of the medical education apocalypse. *Acad Med* 2008;**83** (12):1132–9.
7 Carraccio C, Englander R, Holmboe ES, Kogan JR. Driving care quality. *Acad Med* 2016;**91** (2):199–203.
8 Gruppen LD, Mangrulkar RS, Kolars JC. The promise of competency-based education in the health professions for improving global health. *Hum Resour Health* 2012;**10** (1):43.
9 Iobst WF, Sherbino J, Cate OT, Richardson DL, Dath D, Swing SR, *et al.* Competency based medical education in postgraduate medical education. *Med Teach* 2010;**32** (8):651–6.
10 Carraccio C, Wolfsthal SD, Englander R, Ferentz K, Martin C. Shifting paradigms: from Flexner to competencies. *Acad Med* 2002;**77** (5):361–7.
11 Klamen DL, Williams RG, Roberts N, Cianciolo AT. Competencies, milestones, and EPAs – Are those who ignore the past condemned to repeat it? *Med Teach* 2016;**38** (9):904–10.
12 Hodges B, Lingard L, eds. *The Question of Competence: Reconsidering Medical Education in the Twenty-First Century.* Ithaca: Cornell University Press 2013.
13 Talbot M. Monkey see, monkey do: a critique of the competency model in graduate medical education. *Med Educ* 2004;**38** (6):587–92.
14 Brooks MA. Medical education and the tyranny of competency. *Perspect Biol Med* 2009;**52** (1):90–102.
15 Leung WC. Competency based medical training: review. *BMJ* 2002;**325** (7366):693–6.
16 Lurie SJ, Mooney CJ, Lyness JM. Measurement of the general competencies of the accreditation council for graduate medical education: a systematic review. *Acad Med* 2009;**84** (3):301–9.
17 Malone K, Supri S. A critical time for medical education: the perils of competence-based reform of the curriculum. *Adv Health Sci Educ* 2012;**17** (2):241–6.
18 Whitehead C, Austin Z, Hodges B. Flower power: the armoured expert in the CanMEDS competency framework? *Adv Health Sci Educ* 2011;**16** (5):681–94.
19 Hodges BD, ed. *The Objective Structured Clinical Examination: A Socio-History.* Berlin: LAP Press 2009. 344 p.

20 Foucault M. *The Archaeology of Knowledge and the Discourse on Language*, Vol. **26**. Sheridan Smith AM, transl. New York, NY: Pantheon 1972;49.
21 Whitehead CR, Hodges BD, Austin Z. Dissecting the doctor: from character to characteristics in North American medical education. *Adv Health Sci Educ Theory Pract* 2013;**18** (4):687–99.
22 Perakyla A. Analyzing talk and text. In: Denzin N, Lincoln Y, eds. *The Sage Handbook of Qualitative Research*, 3rd edn. Thousand Oaks: Sage Publications 2000;869–86.
23 Shaw SE, Greenhalgh T. Best research–for what? Best health–for whom? A critical exploration of primary care research using discourse analysis. *Soc Sci Med* 2008;**66** (12):2506–19.
24 Hodges BD, Kuper A, Reeves S. Discourse analysis. *BMJ* 2008;**337**:a879.
25 Kuper A, Whitehead C, Hodges BD. Looking back to move forward: using history, discourse and text in medical education research: AMEE guide no. 73. *Med Teach* 2013;**35** (1):e849–60.
26 Hodges BD, Martimianakis MA, McNaughton N, Whitehead C. Medical education… meet Michel Foucault. *Med Educ* 2014;**48** (6):563–71.
27 Razack S, Lessard D, Hodges B, Maguire M, Steinert Y. The more it changes; the more it remains the same: a foucauldian analysis of Canadian policy documents relevant to student selection for medical school. *Adv Health Sci Educ* 2014;**19** (2):161–81.
28 Hodges BD. Rattling minds: the power of discourse analysis in a post-truth world. *Med Educ* 2017;**51** (3):235–7.
29 Foucault M. *Language, Counter-Memory, Practice*. New York: Cornell University Press 1981;240.
30 Rogers R, Malancharuvil-Berkes E, Mosley M, Hui D, O'Garro JG. Critical discourse analysis in education: a review of the literature. *Rev Educ Res* 2005;**75** (3):365–416.
31 Whitehead CR, Austin Z, Hodges BD. Intentions versus unintended discursive consequences: reflections upon Sherbino *et al.'s* commentary on "Flower Power". *Adv Health Sci Educ* 2011;**16** (5):699–701.
32 Horsley T, (alph.) Bhanji F, Busing N, *et al.* Identifying optimal competency-based education in the health professions: A protocol for a mixed-method integrative review. Association of Medical Education Europe (AMEE), First World Summit on Competency-Based Education. Barcelona, Spain. August 2016.
33 Societal Needs Working Group. Skills for the new millennium. *Ann R Coll Physicians Surg Can* 1996;**29**:206–16.
34 Whitehead C. Scientist or science-stuffed? Discourses of science in North American medical education. *Med Educ* 2013;**47** (1):26–32.
35 ten Cate O, Scheele F. Competency-based postgraduate training: can we bridge the gap between theory and clinical practice? *Acad Med* 2007;**82** (6):542–7.
36 Touchie C, ten Cate O. The promise, perils, problems and progress of competency-based medical education. *Med Educ* 2016;**50** (1):93–100.
37 Diwakar V. Commentary: the baby is thrown out with the bathwater. *BMJ* 2002;**325** (7366):693–6.
38 Green ML, Holmboe E. The ACGME toolbox: half empty or half full? *Acad Med* 2010;**85** (5):787–90.
39 Hauer KE, Soni K, Cornett P, Kohlwes J, Hollander H, Ranji SR, *et al.* Developing entrustable professional activities as the basis for assessment of competence in an internal medicine residency: a feasibility study. *J Gen Intern Med* 2013;**28** (8):1110–4.
40 Meade LB, Borden SH, McArdle P, Rosenblum MJ, Picchioni MS, Hinchey KT. From theory to actual practice: creation and application of milestones in an internal medicine residency program, 2004-2010. *Med Teach* 2012;**34** (9):717–23.
41 Schumacher DJ, Lewis KO, Burke AE, Smith ML, Schumacher JB, Pitman MA, *et al.* The pediatrics milestones: initial evidence for their use as learning road maps for residents. *Acad Pediatr* 2013;**13** (1):40–7.
42 Bandiera G, Lendrum D. Dispatches from the front: emergency medicine teachers' perceptions of competency-based education. *CJEM* 2011;**13** (3):155–61.
43 Dijksterhuis MGK, Voorhuis M, Teunissen PW, Schuwirth LWT, ten Cate OTJ, Braat DDM, Scheele F. Assessment of competence and progressive independence in postgraduate clinical training. *Med Educ* 2009;**43** (12):1156–65.
44 Rangel JC, Cartmill C, Kuper A, Martimianakis MA, Whitehead CR. Setting the standard: *Medical Education's* first 50 years. *Med Educ* 2016;**50** (1):24–35.
45 Whitehead CR, Kuper A. Faith-based medical education. *Adv Health Sci Educ* 2017;**22** (1):1–3.
46 Bristowe K, Harris P. Michel Foucault: discourse in the modern medical consultation. *Med Educ* 2014;**48** (6):552–3.
47 Frank JR, Mungroo R, Ahmad Y, Wang M, De Rossi S, Horsley T. Toward a definition of competency-based education in medicine: a systematic review of published definitions. *Med Teach* 2010;**32** (8):631–7.
48 Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med* 2013;**88** (8):1088–94.
49 Oandasan I, Wong E, Saucier D, Donoff M, Iglar K, Schipper S. Triple C: linking curriculum and assessment. *Can Fam Physician* 2012;**58** (10):1165–7.
50 Sonnadara RR, Mui C, McQueen S, Mironova P, Nousiainen M, Safir O, *et al.* Reflections on competency-based education and training for surgical residents. *J Surg Edu* 2014;**71** (1):151–8.
51 Schultz K, Griffiths J, Lacasse M. The application of entrustable professional activities to inform competency decisions in a family medicine residency program. *Acad Med* 2015;**90** (7):888–97.
52 Hawkins RE, Welcher CM, Holmboe ES, Kirk LM, Norcini JJ, Simons KB, Skochelak SE. Implementation of competency-based medical education: are we addressing the concerns and challenges? *Med Educ* 2015;**49** (11):1086–102.

53 Vakani FS, Jafri W, Jafri F, Ahmad A. Towards a competency-based postgraduate medical education. *J Coll Physicians Surg Pak* 2012;**22** (7):476–7.
54 ten Cate O, Snell L, Carraccio C. Medical competence: the interplay between individual ability and the health care environment. *Med Teach* 2010;**32** (8):669–75.
55 Parent F, Jouquan J, De Ketele JM. CanMEDS and other ''competency and outcome-based approaches'' in medical education: clarifying the ongoing ambiguity. *Adv Health Sci Educ Theory Pract* 2013;**18** (1):115–22. https://doi.org/10.1007/s10459-012-9402-z.
56 Grant J. The incapacitating effects of competence: a critique. *Adv Health Sci Educ Theory Pract* 1999;**4** (3):271–7.
57 Lurie SJ. History and practice of competency-based assessment. *Med Educ* 2012;**46** (1):49–57.
58 Epstein RM, Hundert EM. Defining and assessing professional competence. *JAMA* 2002;**287** (2):226–35.
59 Govaerts MJB. Educational competencies or education for professional competence? *Med Educ* 2008;**42** (3):234–6.
60 Royal College of Physicians and Surgeons of Canada. Imagine the future: An international summit on competency-based medical education [consensus conference]. 2009 Ottawa, 9–11 July.
61 Tarrant J. What is wrong with competence? *J Further Higher Educ* 2000;**24** (1):77–83.
62 Schuwirth LWT, van der Vleuten CPM. Changing education, changing assessment, changing research? *Med Educ* 2004;**38** (8):805–12.
63 ten Cate O. Trust, competence, and the supervisor's role in postgraduate training. *BMJ* 2006;**333** (7571):748–51.
64 Reeves S, Fox A, Hodges BD. The competency movement in the health professions: ensuring consistent standards or reproducing conventional domains of practice? *Adv Health Sci Educ* 2009;**14** (4):451–3.
65 Jouquan J. L'e′valuation de la qualite′ des formations: au-dela' des chiffres. In: Be′dard D, Be′chard J-P, eds. *Innover dans l'enseignement supe′rieur*. Paris: PUF 2009;199–212.
66 Bates I. The competence and outcomes movement. In: Flude M, Sieminski S, eds. *Education, Training and the Future of Work II*. London: Routledge 1999;98–123.
67 Barnett R. *The Limits of Competence: Knowledge, Higher Education and Society*. Buckingham, UK: Society for Research into Higher Education & Open University 1994.
68 Elliott J. *Competency Based Training and the Education of Professions—Is a Happy Marriage Possible?*. Buckingham: Open University Press 1991.
69 Eraut M. *Developing Professional Knowledge and Competence*. London: Falmer Press 1994.
70 Grundy S. *Curriculum: Product or Praxis*. London: Routledge Falmer 1987.
71 Lave J, Wenger E. *Situated Learning. Legitimate Peripheral Participation*. Cambridge: Cambridge University Press 1991.
72 Polanyi M. *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: University of Chicago Press 1958.
73 Schon DA. *The Reflective Practitioner*. Aldershot, UK: Arena Books 1991.
74 Skilbeck M. Ideological education theories. In: Skilbeck M, ed. *Curriculum Design and Development, Course E203, Unit 3*. Buckingham: Open University Press 1976.
75 Thornton T. Tacit knowledge as the unifying factor in evidence-based medicine and clinical judgment. *Philos Ethics Humanit Med* 2006;**1** (2):1–10.
76 Wagner RK, Wagner SRJ. Practical intelligence in real-world pursuits: the role of tacit knowledge. *J Pers Soc Psychol* 1985;**49**:436–58.
77 Wenger E. *Communities of Practice. Learning, Meaning and Identity*. Cambridge: Cambridge University Press 1998.
78 Arnold L. Assessing professional behavior: yesterday, today, and tomorrow. *Acad Med* 2002;**77**:502–15.
79 Bloom BS. *Taxonomy of Educational Objectives. Handbook I: Cognitive Domain*. New York: David McKay Company 1956.
80 Hodkinson P, Issitt M. *The Challenge of Competence: Professionalism though Vocational Education and Training*. London: Cassell 1995.
81 Hyland T. Competence, knowledge and education. *J Phil Edu* 1993;**27** (1):57–68.
82 Hyland T. *Competence, Education and NVQs: Dissenting Perspectives*. London: Cassell 1994.
83 Mansfield B. Competence and standards. In: Burke JW, ed. *Competency Based Education and Training*. Lewes: Falmer Press 1989.
84 Mitchell L, Wolf A. Understanding the place of knowledge and understanding in a competence based approach. In: Fennel E, ed. *Development of Assemble Standards for National Certification*. Sheffield: Employment Department 1991;25–9.
85 Pearson AT. The competency concept. *Educ Stud* 1980;**11** (2):145–52.
86 Skinner BF. *Walden Two*. New York: Macmillan Publishers 1976.
87 Stenhouse L. *An Introduction to Curriculum Research and Development*. London: Heinemann 1986.
88 Tyler RW. *Basic Principles of Curriculum and Instruction*. Chicago: The University of Chicago Press 1949.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Appendix S1 Process through which articles were screened for inclusion in the archive.

Appendix S2 References included in the archive.

Received 23 March 2017; editorial comments to author 12 May 2017, 25 July 2017; accepted for publication 14 August 2017