

Conceptual and practical challenges in the assessment of physician competencies

Short title: Challenges in competency assessment

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Abstract

The shift to using outcomes-based competency frameworks in medical education in many countries around the world requires educators to find ways to assess multiple competencies. Contemporary medical educators recognize that a competent trainee not only needs sound biomedical knowledge and technical skills, they also need to be able to communicate, collaborate and behave in a professional manner. This paper discusses methodological challenges of assessment with a particular focus on the CanMEDS Roles. The paper argues that the psychometric measures that have been the mainstay of assessment practices for the past half-century, while still valuable and necessary, are not sufficient for a competency-oriented assessment environment. New assessment approaches, particularly ones from the social sciences, are required to be able to assess non-Medical Expert (Intrinsic) roles that are situated and context-bound. Realist and ethnographic methods in particular afford ways to address the challenges of this new assessment. The paper considers the theoretical and practical bases for tools that can more effectively assess non-Medical Expert (Intrinsic) roles.

Introduction

We have all had a favourite pair of shoes, a coat, or perhaps a mug that has seen better days. We carry on using it even though it is falling apart as our fondness transcends its practical or aesthetic limitations. However, sooner or later we are forced to admit its decayed state and we set it aside and start afresh. This is a metaphor for the present state of assessing physician competence. Current models of assessment have served us well in advancing our thinking and practices, but they are becoming increasingly threadbare in light of our emerging understanding of the nature of medical practice and of the assessment of medical practitioners.

This paper was developed from a symposium we gave at the combined Ottawa Conference and Canadian Conference on Medical Education in Ottawa in April 2014. The goal of the symposium was to discuss methodological challenges in the current approaches to assessment of the CanMEDS Roles other than Medical Expert. In this paper we explore why and how the medical education community needs to change its approach to the assessment of competence. Our focus on CanMEDS reflects our own working contexts, but the issues we raise are also applicable to competency frameworks in general, and thus highly relevant to other medical education contexts that seek to assess the competency of medical students and trainees.

Background

The formal medical school curriculum has long been a point of discussion and reconsideration. The Flexner report (1910) directed medical education towards a strong focus on the biomedical sciences, something that persists to this day. In recent years medical school curricula have broadened from their biomedical base to explicitly include previously tacit competencies such as communication, professionalism, and leadership. Moving these concepts from the informal and hidden curricula of medical education to its formal curriculum is not just a matter of adding content; these changes require form to be

given to the formless, and new methods to be put in place to match these new and emerging forms.

The development of CanMEDS is an example of this shift. The roots of CanMEDS can be found in the Educating Future Physicians for Ontario (EFPO) project (Whitehead, Austin, & Hodges, 2011a). There were two main drivers for EFPO. Firstly, a physician strike in Ontario in 1986 raised concerns about the effect the strike had on the public perception of doctors. Secondly, there was a coincident and growing move to ensure that medical education in the province was responsive to societal needs (Neufeld et al., 1998). The development of EFPO started with wide-ranging consultations, which were held with patient groups, educators, students and health care professionals to consider what roles physicians ought to play (Maudsley et al., 2000). Eight relatively distinct physician roles were developed in the EFPO process. Canadian specialist physicians took the EFPO roles and re-worked them into the seven current CanMEDS Roles (Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar and Professional) (Frank et al., 1996), in the process removing EFPO's eighth role of 'Person', embedding it instead in the Professional Role (Whitehead et al., 2011a; Whitehead, Selleger, van de Kreeke, & Hodges, 2014). Since then CanMEDS has been adopted across Canada for postgraduate training and it has had a significant influence on other levels of training as well as on medical education systems around the world, including inspiring the development of national competency frameworks in many other countries (Al Bu Ali, Balaha, Kaliyadan, Bahgat, & Aboulmagd, 2013; Malling, Sørensen, Mikines, & Hilsted, 2013).

In naming and adjusting CanMEDS Roles, medical educators have tried to find effective and meaningful ways to ensure that important principles and values are explicitly part of medical education programs, hoping that each iteration will move them closer to capturing the desired qualities of the ideal graduating physician. Understandably, given the complex concepts that underpin the roles, the realization of each role in our students and trainees remains an approximation at best.

The EFPO and CanMEDS Roles were the result of an inductive process, rendering the complexities and pluralities of what it takes to be a medical practitioner into a set of simple and recognizable roles. The aggregate of the individual Roles (reflecting the totality of the ideal physician) comprises the CanMEDS competency framework. Now that CanMEDS has been formalized and expanded on in national and international accreditation standards, educators have been required to deductively translate the now-codified and standardized roles back in to their teaching and assessment practices. Medical educators have risen to the challenge, working diligently to design, pilot, mandate and implement all manner of toolkits, rubrics, milestones and checklists to provide on-the-ground clinical teachers with practical approaches to learner assessment of these competencies (Bandiera, Sherbino, & Frank, 2006; Sherbino, Bandiera, & Frank, 2008; Royal College of Physicians and Surgeons of Canada, 2014). While educators have already been engaged in this process for a number of years, the competency project is still considered by education leaders to be “in its infancy” (Association of Faculties of Medicine of Canada, 2012, p. 4).

While some CanMEDS Roles or competencies (such as Medical Expert) have been relatively easy to teach and assess, others have proved to be more challenging (Verma, Flynn, & Seguin, 2005; Bryden, Ginsburg, Kurabi, & Ahmed, 2010; Leveridge, Beiko, Wilson, & Siemens, 2007). Directors of training programs worry that current assessment strategies do not ensure learner competence in these Roles (Chou, Cole, McLaughlin, & Lockyer, 2008), describing their current options as “artificial” and “contrived,” (Whitehead et al., 2011b, p. 12) and noting a tension between the need to meet accreditation standards and the development of meaningful assessment tools. Unless educators have effective and relevant assessment tools for all competencies, assessment may end up skewed towards ‘easier’ areas, with insufficient attention to those areas for which effective assessment approaches are more elusive.

Understanding competence and competency

Given the well-documented difficulty of assessing certain competencies, it is important to think beyond the most commonly used assessment tools, and consider potential alternate strategies that might be better suited to the assessment of ‘difficult’ competencies. To do this we first need to consider the nature of competency frameworks. Each framework reduces the complexities of multiple individual components of medical practice into a simple structure, often represented as a diagram or figure. CanMEDS is based around seven roles represented as a flower with ‘Medical Expert’ at the centre (Frank & Danoff, 2007), the Accreditation Council for Graduate Medical Education (ACGME) (2006) has a similar model to CanMEDS usually given as a list of functions, while the Scottish Doctor has three concentric rings representing what the doctor is able to do, their approach to practice and their role as a professional (Ellaway et al., 2007). The language used and the way they are each arranged visually is different, although they all aim to represent a physician’s capabilities or competencies (ibid). These frameworks reflect the social contexts from which they sprang; they are “mutually shared and ratified definitions of situation and ... the social actions people take on the basis of those definitions” (Erickson & Schultz, 1997, p. 22).

Although frameworks have similarities (such as professional and communicator roles), there are many differences, both in terms of their content and their structure. The applicability of different frameworks is therefore context dependent even though the context may be regional or national in nature. Furthermore, as contexts change, then, at least by implication, competency frameworks may also need to change to reflect new social and societal circumstances. We suggest, therefore, that the applicability of competency frameworks should be considered as situated and context-specific. We need to consider the geographical and cultural scope for competency frameworks and not just their discipline-specific differences.

In summary, competency frameworks are extremely valuable in that they provide a clear and convenient, if somewhat abstract, model of complex real world systems. As abstractions, however, they necessarily provide a simplified version of the complex ideas they represent and the ways that practice changes in response to the context in which it

takes place. No framework, therefore, is ever ‘the truth,’ but instead all frameworks are approximations, and all will inevitably have limitations as well as strengths.

Assessment of competencies

Once the specific items within any competency model are defined, and there is an acceptable level of consensus to their description of essential aspects of good medical practice, it is then incumbent on medical educators to assure that all these items are assessed in meaningful and effective ways.

The dominant tradition of measurement in education in North America has led to a focus on the application of psychometric methods and concepts to competency frameworks, thereby sometimes limiting discussion of assessment and capability to matters of measurement (Hodges, 2013). Psychometric techniques were first used to evaluate phenomena that were thought of as stable traits that existed within a particular individual: things like truthfulness, logical reasoning, and visual-spatial ability. Cognitive psychologists later expanded the use of these techniques to assess knowledge, and then further to assess performance. Using psychometrically evaluated instruments assumes that we are assessing stable, latent traits within individuals. This implies that, as educators, we are assessing real, measurable, underlying psychological traits (Kuper, Reeves, Albert, & Hodges, 2007).

A psychometric approach works well for constructs that relate to knowledge and technical skill. This approach does not, however, easily align with constructs that are not stable individual traits. CanMEDS Roles such as Advocate and Collaborator, for example, depict how medical professionals should perform in their interactions with others – interactions that are intrinsically context- and culture-specific. Since each medical educator, medical trainee, health care worker, patient and family member will have had different cultural, social and economic structural positions and lived experiences, that individual will, as a result, have a different set of beliefs about contextually-appropriate physician performance. Therefore, no matter how many

attempts are made to neatly codify physician competence, individual views of competent communication, collaboration, professionalism and advocacy will be historically contingent, situational, changeable – and inevitably different from those from other backgrounds and cultures (Kuper et al., 2007).

In addition, there is a growing call for socially accountable medical training to ensure that our graduates can provide what communities need and want (Boelen & Heck, 1995; Frenk et al., 2010). Assessment strategies and practices must therefore embrace and encompass a wide range of concepts, including fairness, individual needs, safety, reliability, and validity and responsiveness to particular societal and community needs.

Interestingly, the pursuit of greater levels of accountability in education can lead to (or reflect) a diminished sense of trust between schools and society, which in turn can lead to a growing focus on measurement of learners (O'Neill, 2013). It is paradoxical that medical education is challenged by social accountability to find assessments that capture qualities that do not yield well to psychometric assessment at the same time as the pursuit of accountability can make measurement seem more important than ever.

Is the medical education community open to adding new assessment tools to the rigorous and powerful ones already provided by psychometricians? We think and sincerely hope so. We also know that there is historical precedent to the adoption of new approaches: psychometric research methodologies were themselves new to medical education in the late 1950s. They were successfully adapted within the medical education community into useful tools to assess biomedical knowledge and technical skills. This adaptation began when psychologists started to attend medical education conferences (from the 1950s) and demonstrated the power of their tools to extract useful insights about learners (Kuper, Albert, & Hodges, 2010; Whitehead, Hodges, & Austin, 2013). These approaches have served the medical education community well by developing new ways of thinking and improving many aspects of medical education practice. We suggest, however, that these tools, while very useful for assessing many things, are not ideal for the more socially and culturally-determined roles that comprise the current nuanced 21st Century understanding of physician competence.

Rethinking methods and means

Given that we need meaningful and effective methods of assessing situated competence, what alternatives are there? We would argue that there are many ways to begin to reimagine assessment and evaluation using social science research methodologies. In this paper we focus on two specific examples: ethnography and realist evaluation, both of which were designed to assess complex social constructs. Each takes into account context and social location, honours the existence of multiple potential subject positions within the same situation, and is open to wide variability in the contextual performance of competence.

Realist inquiry explains the dynamics of complex systems in terms of various mechanisms in different contexts that lead to different outcomes (Wong, Greenhalgh, Westhorp, & Pawson, 2012; Pawson, 2013). Realist inquiry also works with the concept of middle-range theory: demi-regularities within and around particular contexts rather than global phenomena. Realist assessment is therefore about explaining what individuals and groups are doing and how they are doing it rather than measuring a stable and predictable construct.

Ethnographic assessment involves gathering data about social interactions, using tools including observation, discussions, and the analysis of written artifacts. Originally deriving from the discipline of anthropology, ethnography examines social processes, perceptions and behaviours within and between groups (Reeves, Kuper, & Hodges, 2008; Reeves, Peller, Goldman, & Kitto, 2013).

Table 1 describes and compares some of the key practical dimensions of these two approaches.

[TABLE 1 HERE]

Ethnography and realist evaluation are only two examples of methodological approaches for framing the assessment of complex social constructs such as the non-Medical Expert

(Intrinsic) Roles (Sherbino, Frank, Flynn, & Snell, 2011).¹ Although the anthropological and sociological traditions from which such methodologies draw are perhaps less familiar to medical educators in an assessment context, there is a long history of using such methodologies to produce deep understanding through rigorous data collection and analysis. These methodologies can illuminate aspects of trainee performance in the social realm, as well as the contexts of that performance, that have been ignored as ‘noise’ within our almost sixty-year focus on validity and reliability. In doing so they could reasonably be expected to bring us much closer to a meaningful and credible assessment of the non-Medical Expert (Intrinsic) Roles.

Ways forward

We realize that perhaps some might consider the types of change we are proposing to be daunting or unnecessary. Since the medical education community has been happily pursuing psychometric approaches for many decades there is much invested in this approach, not least in methods that have passed accreditation and have been enshrined in organizational arrangements.

We recognize that some educators might consider it easier and highly desirable to continue developing toolkits and rubrics and debating the details of milestones without questioning their theoretical underpinnings too deeply. However, we contend that, without change, the assessment of the socially constructed, non-Medical Expert (Intrinsic) Roles cannot be relevant and rigorous. We do not think that educators will knowingly choose to use methodologically incongruent assessment tools, as in doing so they will fall short of the needs of learners, patients, the profession and society as a whole.

As the medical education community moves to embrace new competency-based approaches and realigns assessment tools to suit the socially determined roles so necessary to good medical practice, we can also consider relaxing the current obsession with assessing everything we can. To what extent is the mantra “if we don’t assess it the

students will not value it” a product of educators’ own making? Academic cultures, such as medical education, where professors routinely end lectures with statements like “I know all you care about it what is on the test, so now I will tell you” clearly implicate teachers in the construction of a test-focused environment. This environment is not universal; in Denmark, for example, there are no residency exams (Hodges & Segouin, 2008; Karle & Nystrup, 1995). Might educators in other settings also be able to find ways to move away from assessment as the primary driver of the entire educational enterprise? And might that not better prepare learners for approaches to ongoing learning in their many years in practice after the cycle of jumping through hoops has ended?

Discussion

Our collective memory tends to be rather vague and partial: we quickly forget where we have been and how we got here. We normalize what we currently have and do (in this case our current constellation of competencies, roles and frameworks) as inevitable and natural. However, it is now apparent that our current approaches to competence and competencies are not yielding the anticipated benefits across all domains of necessary physician practice.

We have suggested ethnography and realist evaluation as two possible alternative approaches that could add both rigour and nuance to our assessment armamentarium. Other potential methodologies relevant to the assessment of the non-Medical Expert (Intrinsic) Roles include case study methodology, critical discourse analysis, and phenomenology. As with ethnography and realist inquiry, each of these other potential assessment approaches would have its own uses, strengths, and limitations, and none would be sufficient unto itself. We do not for a moment suggest that any one approach could or should take over assessment the way that psychometrics has dominated health professions education for the last half-century. Instead, we envisage an augmentation of our assessment armamentarium to ensure that we have tools appropriate to our needs.

Expanding our options and drawing on multiple assessment approaches fits with other trends in medical education. For example, we now recognize multi-source feedback to be invaluable as a way to gather the impressions of different members of the health care team (and sometimes patients and family members) on the performance of a trainee. We need to apply the same logic to our assessment methodologies. Multiple lenses, crafted to illuminate particular aspects of a trainee, a training program or an educational environment will enrich our understanding of our learners, of medical practice, and our assessment of the former in preparation for the latter. Like the optician carefully crafting different lenses depending on the visual needs of her client, so too can medical educators develop assessment tools that will allow us to see clearly the multiple aspects of the trainee, the training program, or the training environment that we wish to examine.

In writing this paper we are aware that, while we have identified a problem and proposed a solution, we have not substantially explored how realist and ethnographic methods translate into specific instruments and methods for assessing non-Medical Expert (Intrinsic) Roles. That is a matter for subsequent work and is beyond the scope of this paper. We present this paper as a transitional step in expanding the repertoire of assessment methods, and know that further practical explorations of how to implement these additional approaches will be required. We also acknowledge the influence of the Canadian context on our deliberations. CanMEDS is a dominant feature in our medical education landscape and our perspectives may therefore not fully translate into other settings that do not have an equivalent competency framework presence. Nevertheless, we see the adoption of competency frameworks as an international phenomenon and as such we anticipate that our work is relevant to most jurisdictions, if not all.

Conclusions

We do not presume to prescribe what the medical education field can do; that is a collective decision that needs many eyes and minds to work through the multiple issues involved. What the medical education community must not do, however, is to pretend that it does not have a choice. If this international community does not explore the

potential of social science-based approaches to assessment then there will remain limits to the ability to adequately assess the socially-constructed non-Medical Expert (Intrinsic) Roles. There are, as we have shown, very reasonable alternative approaches that address the different sociocultural contexts of practice and training. Educators must decide if the time is right to incorporate them into contemporary medical education, and to move forward with theoretically diverse methods to assess the conceptually diverse competencies that are required of the competent physician, no matter where they are in the world.

Practice Points

1. Psychometric assessment tools have served the medical education community very well for over half a century;
2. Adding new assessment approaches offers exciting potential to expand assessment in areas that have significant social and cultural elements;
3. Realist and ethnographic methods can provide relevant ways to assess essential competencies that require a sociocultural understanding.

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Footnotes

¹ The term ‘non-Medical Expert’ has become common parlance as a way to describe all the Roles except for ‘Medical Expert.’ The Royal College of Physicians and Surgeons of Canada has recently endorsed the use of the term ‘Intrinsic Roles’ as an alternative.

Tables and Figures

	Ethnographic Methodology	Realist Evaluation
<i>Conceptual Underpinning</i>	Anthropology	Pragmatic, explanatory
<i>Examines</i>	Social processes, perceptions and behaviours within and between groups	Examples of “what works for whom in what circumstances... and why” (Pawson, 2013)
<i>Methods</i>	Immersion in relevant contexts (as a participant or non-participant observer), discussions with individuals within those contexts, analysis of artifacts produced and/or used within those contexts	Analysing multiple pairs of contexts and mechanisms that produce different outcomes in order to recognize patterns of mechanisms known as demi-regularities (not universal truths, but a recognition that, given similar contexts and constraints, individuals and groups tend to act in certain ways)
<i>Aim</i>	To gather data about social interactions in order to understand how individuals function within a group and/or how a group functions with respect to other groups. The goal is to extend both the practical understanding of a particular group or context as well as the theoretical understanding of how such groups or contexts function.	To understand the aspects of the contexts of an intervention that lead to its actual outcomes and the range of mechanisms that connect contexts to outcomes. These mechanisms, which include both processes and structures, are not immediately obvious but are worked out empirically through a theory-based analysis of contexts and outcomes.
<i>Data Collection Tools & Strategies</i>	The cornerstones of ethnographic data collection are participant observation, key informant interviews, and the analysis of textual artifacts.	A wide range of qualitative and quantitative data collection methods are used to develop a detailed understanding of the different contexts in which those outcomes happen and of the mechanisms that bring about those outcomes in those contexts.

<p><i>Advantages for the Assessment of Medical Trainees?</i></p>	<p>Provides a rigorous conceptual framework for medical educators to make use of data that many already gather in practice (e.g. direct observations of trainees, either in person or via video; discussions about their trainees with members of the health care team, patients and their families, and other relevant informants; documents produced by their trainees). Emphasis on detailed, rich descriptions of observed and experienced interactions to develop a contextual understanding both of the range of interpersonal, social behaviours and of the range of how those behaviours are perceived.</p> <p>The flexibility of data gathering modalities means that assessments can be used in situations where trainees are with individual preceptors, such as in a rural outpatient clinic, as well as in situations when they are exposed to a large and varied group of clinicians, such as on a hospital ward. The flexibility of ethnographic units of analysis, with the ability to focus on individuals within a social group as well as on the group itself, means that assessments can be tailored to focus on the functioning of single trainees, groups of trainees, or clinical teams.</p>	<p>In assessing our trainees' performance we would no longer be looking for them to act in a standardized way but rather to consistently react appropriately to different contexts. Over time we can build a theoretical understanding of trainee reactions to context. We may also discover the problematic contexts within our health care systems and health care education systems in which it might not be possible for anyone to, for example, communicate well or advocate effectively; rather than penalizing our trainees for not excelling in those contexts, we could focus in those cases on changing the systems around them for the better.</p>
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<i>Rigour</i>	Markers of rigour in these assessments would be described in terms of authenticity and credibility and would include evidence of reflexivity, appropriate sampling strategy for sources of data, thick description, triangulation between sources of data, and linkages to other sources of theoretical understanding of related phenomena.	Rigour in these assessments would generally be established through aspects of data collection and analysis such as reflexivity, appropriate sampling, triangulation, and linkages to theory, as well as the use of appropriate descriptive statistics for quantitative data.
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<p><i>Example: The Assessment of the CanMEDS Advocate Role</i></p>	<p>The family physician preceptor at a community clinic placement site for two family medicine residents needs to assess their competence as advocates, noting that physician advocacy can encompass a range of activities from advocating for individual patient needs in the moment to advocating for long-term political change.</p> <p>He takes extra time to observe the trainees' verbal and non-verbal interactions with their patients (and those patients' families), each other, their physician and non-physician colleagues at the clinic, and the specialists to whom they refer patients, looking for moments of advocacy as well as barriers and enablers of such advocacy within the clinic. He gathers similar observational data from the other physicians at the clinic as well as the clinic nurse, dietician and secretary. He speaks individually with each of the residents about their understanding of physician advocacy and any outside advocacy interests or activities related to medicine, health, or its social determinants. He informally 'interviews' several patients and families from different social, economic, and cultural backgrounds after their interactions with the residents, focusing on their perceptions of the residents as advocates for their health care. He reads the residents' clinic notes and their referral letters to specialists looking for evidence of advocacy. He also notes the residents' involvement in any ongoing advocacy projects being undertaken in his clinic. He analyses this data looking both at the understanding and achievements of the individual trainees as well as at the contextual factors that enabled or prevented involvement in advocacy, and produces a richly-described narrative report about each resident within his particular clinic context.</p>	<p>The program director of a family medicine residency program needs to document the competence of her many residents as advocates, noting that physician advocacy can encompass a range of activities from advocating for individual patient needs in the moment to advocating for long-term political change.</p> <p>She gathers detailed narrative data about her residents from multiple preceptors at multiple training sites over the course of the year. This data addresses many aspects of their performance, including advocacy. From this data she is able to connect the contexts in which the residents learn (different community clinics, hospital-based clinics, and inpatient hospital wards) and the outcomes of their learning, looking for potential mechanisms linking the two. She can analyse the data related to advocacy across sites for each resident, looking for demi-regularities in how that resident comes to function (or not) as an advocate within various contexts.</p> <p>In addition, she can also analyse the advocacy data across residents within sites, looking for demi-regularities within the mechanisms functioning at each site. In this way she can link resident assessment to the evaluation of training sites as appropriate contexts for learning about aspects of competence such as advocacy.</p>
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Table 1: some of the key practical dimensions of ethnographic and realist approaches to assessment.