

# **Competency-Based Medical Education: Origins, Perspectives and Potentialities**

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**Word count** (excluding references and intro statement): 4785

## **Ethical Approval**

Not applicable

## **Conflict of Interest**

None declared

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*Invited by the editor of Medical Education, Olle ten Cate, PhD (University Medical Center Utrecht, the Netherlands) and Stephen Billett, PhD (Griffith University, Brisbane Queensland, Australia) had an email conversation on competency-based professional training in medicine. This discussion addressed its roots, significance and limitations, which extended to considerations of canonical knowledge and skill versus context-dependent ability, and on legitimate peripheral participation through a growing portfolio of entrustable professional activities.*

### **OtC [Tuesday July 2, 2013]:**

Not long ago, when we met at the American Educational Research Association annual meeting in San Francisco and later in Utrecht, we discussed the topic of competency-based medical education and agreed to continue our conversation using email. You have extensive knowledge of the literature and a lot of experience in workplace learning in other domains than medicine, and I expect your insights should be very valuable for medical educators. I was impressed when you used a ruler during your invited talk in Utrecht to show how short we have been using structured schooling approaches to learning compared to the existence of mankind. Workplace learning in clinical medicine – basically clerkships, internships and residency - is increasingly being structured with educational objectives, instructional theory, teaching methods and assessment approaches that are being validated. Competency-based medical education, around since the 1970s (1), has really only caught on at international scale in the last decade and a half.(2–4) I sincerely believe this has improved training, but it has also met with criticism.(5–10)

Let me try to summarize the value and also the problems of competency-based education for undergraduate and postgraduate medical specialty courses as I see them. While university education arose from the wish to provide a means to educate the population in general fields, or liberal arts, as philosophy, rhetoric, music, the more vocational courses, among which medicine, have always combined university education with a practical purpose.

During the 19<sup>th</sup> century university-based medical education started to combine the scholarly approach with practical, workplace training, to meet the legal requirements to practice medicine. Consequently, medical schools began to identify and define objectives for physician training. From the 1950s, medical education became focused on integrated topics across traditional disciplines, such as organs systems. In the 1990s the competency-based movement started to redefine the physician in more general competency terms. The Canadian Medical Education Directives for Specialists (CanMEDS) became a widely known framework of seven roles (i.e. medical expert, communicator, collaborator, manager, health advocate, scholar and professional), adopted in many countries among which mine, and likewise, the USA also adopted a slightly different framework on a national level. Two characteristics of such frameworks, as I observe them, stand out(11): (1) the redefinition of the physician with features previously not emphasized, and (2) the strong wish to certify physicians based on outcome, i.e. attained competence, rather than on input, i.e. time in training, rotations completed, et cetera. It is these aspects I believe that have caused the wide interest among schools and regulators for them.

The implementation of competency-based medical education has also caused dissatisfaction. One reason is that, to translate general domains of competence such as the CanMEDS roles to education and assessment, sets of sub-competencies and key competencies have been defined. The simple framework is easy to comprehend and work with, but I have not met anyone who could easily produce these more detailed units. Clinicians have had difficulty to evaluate their learners on these more detailed theoretical competencies. Checklists that force them to do so (demanded by regulating bodies) then tend to become somewhat meaningless.

This was a reason for me to coin the concept of Entrustable Professional Activities (EPAs).(12,13) EPAs are the acts in professional practice that really matter. While competencies are abstract constructs describing capabilities of persons, EPAs just constitute the work that must be done. As a starting point for competency-based training, to me EPAs

should be core and I have observed that many clinical educators recognize these as adding to a meaningful approach to competency-based education.(14–16)

I have been wondering how someone like you, from a different perspective, would view this development.

**SB [Saturday July 6, 2013]:**

Given that work settings are often either taken for granted or seen as sites for just practising, refining and extending what is learnt in university courses, it is promising that they are now the subject of educational deliberations in their own right. Considering how best to order, organise, utilise and address the limitations of learning experiences in these settings seems timely and helpful. From early on in western societies, experiences in practice have featured as part of professional preparation. Medical education in Hellenic Greece was largely exercised through students' engagement in practice settings, as was architecture and law, it seems.(17) Indeed, with the exception of philosophy, university programs in Hellenic Greece all focused on specific occupations and included practice-based experiences.(17) Hence, there have always been strong occupational focuses within higher education. Even the emphasis on liberal education in 19th and 20th centuries universities was directed towards preparing middle-class (males) for employment in public service, diplomacy or the clergy. (18) So, there is nothing novel or even unusual about higher education being concerned to graduate students who are competent to practice an occupation.

Moreover, presumably graduates want to be competent, and the people and organisations they serve also want them to be competent. The key question seems to arise about what constitutes conceptions and statements of competence, how they shape educational provisions and are used to make judgements about performance. For instance, within vocational education, the concern is that the statements of competence have had as their primary purpose the management of teachers and the educational process over emphasises on developing comprehensive occupational competence.(19) The interest in developing detailed statements of educational intent (i.e. aims, goals and objectives)

coincided with strong interest in behaviouralism. Consequently, many statements of competence have been prepared in ways that emphasise measurability for political and administrative purposes (20). The key educational concerns here are that these statements of competence tend to focus on measurable behaviours, which are often relatively unimportant, yet ignore the kinds of higher order thinking and acting that constitute competence in demanding work such as medicine. In particular, the mismatch between what is advised through studies of expertise and what is privileged in narrow behavioural measures of competence has been a key point of tension.(21) Not taken into account or captured by such highly specific measures are the depth of conceptual understanding, strategic use of procedures and the dispositions (i.e. attitudes and values) that are central to the performance of an occupation such as medicine.

So, having statements of competence that are comprehensive in suggesting what constitutes performance and, hence, needs to be learnt and assessed, can be appraised but do not rely upon overt measurability, and also account for situational variations are of the kind that will be useful for an occupation such as medicine. My practice is to refer to the canonical knowledge of the occupation (i.e. the knowledge which all practitioners would be expected to possess) which has procedural (i.e. knowledge 'how'), conceptual (i.e. knowledge 'that') and dispositional (i.e. knowledge 'for') dimensions.(21) There is also a need to understand that, beyond the canonical, which is largely abstracted from actual practice, is the performance requirements of the particular circumstances where the practice is enacted. Ultimately, it is in these circumstances where competence is demonstrated and judged.(22) Importantly, effective performance or competence in doctors' practice, like that of other occupations is not uniform.(22) Effective performance or competence in doctors' practice, like that of other occupations is not uniform. The competence to perform as a general practitioner, for instance, will vary enormously across locations and communities with different socio-economic profiles.(21) Equally, practising medicine within a hospital setting, remote clinic, sporting facility etc may also differ markedly from what occurs in general practice, for instance. Hence, statements of competence need to be comprehensive in terms

of capturing both the canonical requirements of the occupation (e.g. medicine) and the situational requirements where the occupation is performed and judged (i.e. its circumstantial requirements), and takes account of a range of circumstances in which it is practised (i.e. adaptability).

Consequently, approaches such as the Entrustable Professional Activities may offer a way forward here in capturing the canonical competences required of the medical practitioner more comprehensively and in a more grounded way (12) than narrow behavioural accounts of competence. The application and utilisation for ordering educational experiences and making judgements about occupational performance needs to extend to accommodate the requirements of its enactment and some of the different ways medicine needs to be practised across diverse requirements and circumstances for effective practice. Perhaps Entrustable Professional Activities can either achieve this requirement, or be used as a platform to do so.

**OtC [Friday July 12, 2013]:**

You gave some thought provoking statements that resonate with me. If I summarize well, and please correct me if I misinterpret your words, you are saying that (i) the competence movement has reduced the sense of vocational competence to measurable behavioristic units, which disregards both (ii) important dimensions of competence such as higher order thinking, attitude and values, and (iii) the fact that competence is context dependent and hence can never fully meet the requirements of standardized measurability.

I observe a struggle around the competence concept in medicine and other vocational domains. There is a clear wish to control standards of medical performance on one hand, for the sake of the patients' safety, but also the uneasy feeling that comprehensive standardized competencies are a fata morgana. For some surgical skills and other focused psychomotor skills, performance standards seem attainable; in other features of competence standardization may be problematic.

The desire to measure has always been visible in proponents of educational objectives, such as postwar educationalists Tyler, Bloom and Mager.(23–25) As many programs used their instructions for writing objectives, measurability of outcomes has logically dominated the educational world. Where the problem starts is when qualities of graduates cannot easily be translated in clear and measurable outcomes (such as ethical conduct, professionalism, health advocacy – from the CanMEDS framework I mentioned earlier). Proxies to these constructs are then devised to enable the development of checklists that eventually miss the critical core of the construct to be measured. One crucial moment that led me to think about EPAs was when our University Medical Center CEO Geert Blijham once said to me, about 10 years ago, “since the new nursing training has moved from in-service training in the hospital to competency-based training in a school, these graduates cannot do simple things like making the correct calculations for an intravenous drip anymore”. That struck me as a paradox. How can renewed, competency-based education yield graduates that start lacking critical competencies? Clearly this new training was *not* adequately competency-based. I felt there was a need to much more closely follow what the demands of clinical practice are when defining competencies. In medicine, and probably in other professions, “trusting” a trainee to perform crucial activities is probably near to what most professional regard as critical for good performance. Hence, the idea of Entrustable Professional activities arose. Now clearly “trustworthiness” is a broader concept than reliably measurable competence in its traditional sense of a standardized skill. It is more holistic, but also dependent on the context (26), so I would agree with your notion of context dependence. It includes tacit notions of what is a good doctor. The notion of context-dependence of medical competence allows for differences dictated by different contexts and different expert evaluators.(27) A highly successful gynecologist in Bangladesh may be inadequate in New York and vice versa. What seems key is whether the trainee or professional is able to gain trust in a specific environment. High grades for standard exams may have limited validity. I now see some medical schools move away from grading

students, based on quantitatively measurable features, towards narrative portfolio evaluations of learners.(28)

How much would you agree that it is time to move away from the notion of standardized competence, and if so, how would you think we should reconcile this idea with justified demands from society that doctors meet the absolute, preset standards and a culture that values the ranking of individuals on such measures?

**SB [Sunday July 14, 2013]:**

You have captured and summarised very well what I, and others, have proposed about the limitations of narrow statements of competence and their encapsulation within a behavioural framework. The historical moment you identify is important. Tyler's seminal work on curriculum was published in 1949 (23) in a post-war era where measurability was important, and became heightened in the 1950s after Russia successfully launched their Sputnik (e.g. (29)). Western governments concluded that their educational systems and their teachers had failed the promise that democratic societies offered, when compared with Communist regimes. Ironically, the response was to enact highly centralised control over what occurred within schooling and behavioural objectives and associated measures were introduced as means to specify what students would learn and for what the schooling system would be accountable. In some ways, this was a statement about education being far too important to be left up to educators. The point is that measures were introduced that were more about accountability and focus more on measurability for administrative purposes than for guiding the educational project. One lasting legacy of this intervention has been that in vocational, and now professional, education these measures are routinely used as means in attempts to secure what powerful external interests (e.g. industry, professional bodies) want of tertiary education. That is, detailed pre-specified learning outcomes are identified that are to be of the highly measurable kind. So, what medical education has experienced very much reflects these historical and institutional trends.

The example I use most often to indicate the weakness of this approach is to critique the capacity of behavioural measures to capture the requirements for safe working. These requirements are one of the most fundamental competencies required of workers: to be able to work safely. Yet, it is beyond the scope of behavioural measures to capture these requirements, not the least because of the need to appraise workers' dispositions (i.e. attitudes, values and intentionalities) and their performance over time. This appraisal goes beyond what can be captured through narrow competency accounts based upon measurable and observable performance. Consequently, if foundational capacities such as working safely cannot be expressed or assessed by such approaches then it is, at best, incomplete, but more likely largely inadequate.

Your deliberations also emphasise the importance of accounting for taking into consideration the performance of medical practice as being highly situated, with which I concur. However, these performance requirements need to be balanced against those that represent the canonical knowledge of the occupation (what has arisen historically and is accepted as being required capacities of medical practitioners).(21) So, there is a requirement to take account of both the canonical and situational requirements of medical competence in considering how medical work needs to be expressed and assessed. So, it is more than context dependent performance, although that is where medical practitioners will perform and be assessed. So, the gynaecologists working in both Bangladesh and New York might possess the same kinds of canonical knowledge (i.e. concepts, procedures and dispositions required by gynaecologists), but their practice requires they enact this knowledge in distinct ways to be effective in that situation.(22)

Your responses about moving away from standardized notions of competence, lead to inevitable questions about how curriculum development for medical education should best progress, and how this is aligned with your concept of Entrustable Professional activities. Curriculum development should involve the bringing together, reconciling and prioritising the demands of a range of informing perspectives and interests. These are then sifted and valued through a consideration of the worth of their various contributions. Codified

understandings about medical practice from professional bodies provide an important and legitimate perspective and contribution to such curriculum development. These understandings also need to be considered against the situated requirements for performance of medical work. One exercise is to identify the particular requirements for practice through capturing the daily and weekly activities and interactions enacted in the particular circumstance of practice, as well as ascertaining those which are necessary but are rarely, and perhaps never required to be practiced.<sup>(30)</sup> For instance, there may be performance requirements which are unlikely to be experienced across working year, yet medical practitioners need to know about in case they occur. Importantly, the two sets of considerations: the canonical and situational can offer a richer expression of the requirements for medical education. This includes a range of understandings about variations in performance requirements, and considerations for what kind of experiences students need to be able to develop both the canonical knowledge of medicine, and be adaptable enough to be able to understand and address diverse situational requirements that arise in actual practice. Hence, to respond directly to your question there needs to be accommodation between the absolute pre-specified standards being set out by society for occupations such as medicine, as well as understandings about the diversity of medical practice and the situational requirements for performance and their assessment. Certainly, engaging in particular situational activities and learning context requirements may well assist students in developing an understanding of both the canonical and situational. However, it is likely that these two distinct sets of requirements may need to be made explicit by an educator or clinician.

I trust these responses offer a reasonable fit with your requests.

### **OtC [Friday July 19, 2013]**

It is a revelation to realize how much education is influenced by specific historical, political and societal happenings and how the competence-movement is a result of them. To add another example, health care was shocked by the finding how unsafe hospital visits are

for patients.(31) Instead of being a safe haven for ailing citizens, we now realize that hospitalization forms a threat to health. Since this publication, the book *To Err is Human*, patient safety has become a major issue in hospital management and also in education, stimulating new standards for safe work and health workers' competence. Hospitals and medical schools are now being accredited for quality and safety ([www.jointcommissioninternational.com](http://www.jointcommissioninternational.com)), as my institution recently was. I was involved in listing many clinical activities and in defining when trainees are expected to be ready to perform these, with either direct, proactive or indirect, reactive supervision. This clearly is an example of external influence on competency-based curriculum development. I am not criticizing this development; in fact it aligns well with and even stimulates the thinking in terms of EPAs. It forces us to relate competences to what really happens in clinical practice in a local context.

To summarize a suggestion from your email, we may need to distinguish context-free canonical standards of professional competence from situative capabilities that allow for practicing in a local context. Both should be important. It looks like traditionally the first is granted through education and a diploma, while the latter may be weighted at a local job application. It almost feels like a dichotomy of canonical knowledge and skill versus the will to use them and knowing when and how to do this in a given context. It reminds of the distinction of cognitive versus affective and meta-cognitive abilities.(32)

Now here is where we see medical education change. By including other domains of competence than just knowledge and skill, such as ethical conduct, empathy, trustworthiness and probably the qualities that you allude to as requirements for safe practice, educational programs start to focus more on the evaluation of the *application* of canonical competence in a manner that shows these more context-bound qualities. Some call these the 'soft competencies', and I view this process as detouring back to rather natural, tacit qualities that have become somewhat lost in current complex health care contexts, with its fragmentation because of the myriad of subspecialties, short hospitalizations of patients, restricted working hours and frequent handovers of responsibility for patients. I am afraid this complexity has

become a fact of life and there is a need to cope with it in our teaching and assessment approaches.

New assessment methodologies for trainees in the workplace, such as sampled observations in real life practice (33), sometimes with unannounced incognito simulated patients (34) and multisource evaluations (35) may capture how learners and professionals act in response to local conditions. A recent research project at my school even focused on the question: can we trust medical graduates to deal with *unfamiliar* situations i.e. those that were never explicitly taught?(36) As contexts and patients cannot be standardized, like in factory mass production processes, we need inferences from observations that graduates have the necessary adaptive expertise to flexibly cope with new challenges. For this part of competence, there is a need to move away from traditional standardized assessments. I believe that the concept of ‘trusting a trainee to take on critical responsibilities’ captures more than the objectified assessment of competence. In dialogues with clinicians I let them thinking of having a trainee care for their family, or for the prime minister, if they were ever referred to them. Both canonical and context-bound competences are then at stake, and the qualities for these are clearly different. For example, you may trust trainees more readily who know their own limitations well and will ask for help if needed, than the more skillful ones who never ask for help.

So yes, standardized canonical competence, measured with standardized tests may be supplemented with the evaluation of context-bound, adaptive competence, which is not standardized across all thinkable situations and has more qualitative nature. We need more think of how to do this. Checklists are still prevalent to translate these more qualitative features into scores, to enable grading, for administrative purposes, to enable decisions on progress, graduation and ranking of learners and graduates, and for psychometric validation. Some begin to feel that in this translation of constructs into numbers, important information gets lost. For example, the Cleveland Clinic Lerner College of Medicine is actually moving away from grading medical students, to focus on developmentally appropriate performance standards, captured in narrative descriptions.(37) In graduate medical education, all

programs in the US must now design behavioral milestone descriptions (38), be it that these are still translated to a 9-point scale.

I like to conclude that the justified accountability of medical schools to meet agreed upon, canonical standards for all their graduates must be supplemented with some proof that graduates can actually be trusted to apply these knowledge and skills of a local health care context. This can be evaluated by observing trainees enact EPAs and their assessment should include qualitative facets.

There is one aspect of working with EPAs that we have not discussed but that I would like to hear your opinion about. Separating professional practice in distinct EPAs allows for flexibility in the approach to training. Trainees may be granted responsibilities to work unsupervised for different EPAs at different phases in their training and at different moments compared to other trainees, depending on ability and on affordances in the local context. (26,27) This enables a gradual growth into the profession instead of one moment of graduation and licensing. True competency-based training is less time-bound and reflects a gradual legitimate peripheral (39) and increasingly central participation in the professional community. Would you think that gradually increasing this legitimacy by certification for separate EPAs as soon as mastery is reached could and should replace general licensing at the end of specialty training?

**SB [July 22, 2013]:**

To conclude fairly summarily, three statements are offered here. Firstly, the explicit purposes of medical education need to extend to include medical practice as going beyond canonical medical knowledge and also comprise securing situated performance. It follows that the educational provision needs to include experiences that promote understandings and practices for something of the range of situations where medicine is practised and awareness of variations of situated performance generated in graduates, including through assessment. Secondly, the processes of medical education need to address both the kinds of epistemological actions by students that will assist them learn the required knowledge in

ways that are safe for themselves and their patients, but also through clinical environments which can both encourage yet place constraints upon medical students. That is, a granting agency to learn through practice, but having boundaries that protect both students and patients. Thirdly, and to specifically address the final concern about trustworthiness and entrustable activities, it may well be worth adopting a view of curriculum that goes back to its original meaning – ‘the track to progress along’. In any educational projects, students will progress at different places and learn in distinct ways and particular kinds of knowledge. Hence, the idea of progressing along a phase of activities and progressing in personally particular ways recognises both the importance of curriculum as a set of experiences and the necessity of learners engaging in and progressing along a pathway which permits them to be trustworthy in performing as a medical practitioner. Hence, the framing of this approach to medical education sits within canonical concepts of the broader educational project: informed purposes; processes focused on managed engagement and learning; and a consideration of curriculum as a personal trajectory.

### **OtC [Wednesday July 24, 2913]**

Before we finalize I would like to rephrase my question more succinctly. The medical profession is highly regulated. Every country has legislation that prohibits citizens to perform medical acts unsupervised unless legally qualify, proven by examinations and degrees. Most prominent are the MD degree with subsequent registration and the registration as a specialist. These are the two major milestones in het medical career. However, the MD degrees has shifted in its significance in the past century, specifically in the western world, as practically every clinician now goes through additional training before unsupervised practice is legally allowed, and reimbursed by insurance companies. So basically it is the postgraduate medical diploma, after 10 to 15 years of higher education that grants full independence. It happens overnight that the medical trainee becomes an independent practitioner. My question is, can you imagine a different world, in which trainees become legally licensed for parts of their profession, well monitored for each important task to be

bestowed upon them, and, thus, more gradually become this independent practitioner, rather all that at once. Think of the surgeon being legally allowed to do surgery in a confined domain on low risk patients, while still, part time, mastering different procedures or deal with more complex patient to complete a broader portfolio of EPAs. Likewise, specialists, maybe after a short, broad general training, could start to bear full responsibility for limited tasks and gradually add qualification over years. This may even extend throughout their working life. I don't expect a conclusive answer but I'm interested in your thoughts.

**SB [Thursday July 25, 2013]**

In terms of practice-based approach to curriculum what you refer to is a very consistent with what has happened across human history in a number of occupations, as reported in anthropological studies.(40) That is, the participation of workers progresses from activities where there is a relatively low consequence of errors, through to those activities where errors could come at a high cost.(41) Curiously, this idea is central to the original meaning of the word curriculum: the course to follow or a track to progress along, and has wide applicability. For instance, it seems that in Hellenic Greece medical students stayed with patients after doctors had treated them and acted like nurses, before going on to practice on patients themselves.(17) Elsewhere, and analogously aircraft pilots work through being licensed to fly small light aircraft through to larger passenger planes. Even then, they may have to be familiar with particular routes and airports before being able to captain these planes. However, with medicine, it might be more complicated. That is, there is a need to accommodate different kinds of pathways. Your example above hints at the progression from basic surgery through to increased surgical specialism. However, more than being about increased specialisms they can also be about the broadening of medical practice abilities. For instance the range of skills required of a general medical practitioner in a rural or remote community or other lowly populated areas may be characterised by a need for a breadth of medical knowledge and skills. Hence, the kind of licensing arrangements to which you refer would need to accommodate increasing diversity of medical tasks as well as increasing

specialisation. Certainly, having matrices of a breadth as well as specialisation may well provide a framework through which such a portfolio of EPAs might be developed and certified. So, as long as the broader portfolio could accommodate both breadth as well as depth this may be a useful and practice oriented scheme to consider within medical education and accreditation.

### **OtC [Thursday July 25, 2013]**

This sounds like a recommendation to return to well-monitored, practice oriented and gradual increase of professional responsibility, which can be seen as both old and as new. It may reconcile well the wish to control standards of practice and to be flexible and individualized in our curricula. A nice final statement.

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