

CHAPTER 2

Entrustable professional activities, entrustment, and the conceptualization of competence in the health professions

Olle ten Cate, Marije P. Hennis, Natasha Khursigara-Slaterry,
María José López, Robert Sternszus

Abstract

The use of entrustable professional activities (EPAs) and entrustment decision-making in health professional education was proposed to operationalize competency-based education. To ground its use, a common conceptualization of ‘competence’ is needed. Based on theoretical notions of epistemology (distinguishing propositional, procedural, and experiential knowledge) and inspired by the theoretical insights of Vygotsky, Maslow, Billett, and others, the authors elaborate a three-layered model that includes canonical competence (what every professional should have mastered, independent of context), contextual competence (the ability to work in relevant contexts and apply canonical competence), and personalized competence (the individual approach to high-level practice). The model aligns well with curricula that stress knowing, doing, and being, combining competency-based standards with professional identity formation.

EPAs and entrustment decision-making typically regard the contextual layer of competence. This is because entrustment decisions, to support trainees in their progressive, professional autonomy, happen in clinical contexts where canonical, context-independent knowledge and skill are necessary but insufficient. Passing the threshold of entrustment with clinical responsibilities draws on both canonical competence and the ability to work in clinical contexts, responding to the needs of patients, of collaborators, and working within the rules and habits of the local environment. Once a trainee is entrusted with clinical

How to cite this book chapter:

ten Cate O, Hennis MP, Khursigara-Slaterry N, López MJ, Sternszus R. Entrustable professional activities, entrustment, and the conceptualization of competence in the health professions. In: ten Cate O, Burch VC, Chen HC, Chou FC, Hennis MP. (Eds). *Entrustable Professional Activities and Entrustment Decision-Making in Health Professions Education*, Chapter 2, pp. 15–24. [2024] London: Ubiquity Press. DOI: <https://doi.org/10.5334/bdc.b>

responsibilities, and feels confident about the first two layers of competence, personalized competence can emerge more prominently, leading to integrated professional and personal identity formation.

The three layers of competence together establish the conditions to think, act, and feel like a health professional: the knowing, the acting, and the being.

Authors

- Olle ten Cate, PhD. University Medical Center Utrecht, Utrecht, the Netherlands and University of California, San Francisco, USA. Correspondence: t.j.tencate@umcutrecht.nl
- Marije P. Hennis, MD, PhD, MSc Clin Ed. University Medical Center Utrecht, the Netherlands.
- Natasha Khursigara-Slattery MD, MEHP. Mid-West Intern Network, University of Limerick, Limerick, Ireland.
- María José López MSc. Facultad de Ciencias Médicas, Universidad Nacional de Cuyo, Mendoza, Argentina.
- Robert Sternszus MDCM, MA(Ed). Department of Pediatrics & Institute of Health Sciences Education, McGill University, Montreal, Canada.

Introduction

Entrustable professional activities (EPAs) represent core components of a profession that their members are privileged to perform, often exclusively. Although there is more to professional formation than professional activities, EPAs are crucial in directing the education and assessment of trainees to become professionals. Professionals must become competent to carry out these tasks and this competence must largely be acquired during a period of education, professional training, and practice experience. Health professionals who have completed training must be declared competent by their schools, by their programs, and in many countries by medical and specialty boards, and thus deemed qualified to perform all of the EPAs of their profession in an unsupervised manner. Because the practice of health care is restricted to trained, qualified professionals, assessment of their readiness can be viewed as an entrustment decision. In other words, society, represented by educational institutions and licensing bodies, decides that professionals who have completed appropriate education are sufficiently competent to practice and can be entrusted exclusively with the care of population health.

EPAs must thus be embedded within a conceptualization of medical^a competence. To enable schools, programs, and licensing bodies to create assessments that can attest to readiness to practice—an entrustment decision—competence must be defined. This, however, is not easy. One of the many attempts to define medical competence is ‘the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.’¹ Although this is a well-known and attractive, holistic definition, it does not provide practical anchors for assessment. More detailed descriptions are found in competency frameworks,^{2–4} which break down medical competence into detailed competencies (such as the ‘ability to share health care goals and plans with patients and their families’), categorized within larger competency domains (such as medical expertise, communication, collaboration, professionalism).^{5,6}

These frameworks, however, have also been criticized because of their reductionist nature.^{7,8} As such, competence has been defined either too broadly (not practical) or too narrowly and in too much detail (and missing some of the essence); both directions have disadvantages. And, yet, a deep understanding of what competence is appears essential in health professions education, because, unlike many other educational institutions, where the retrospective achievement of requirements is sufficient, the prospective permission to practice (in fact, entrustment) conferred by educational institutions and certifying bodies cannot be validly determined without it.

This chapter aims to provide a theoretical foundation⁹ for the practical use of EPAs and entrustment decision-making in health professions education that is rooted in a deep understanding of medical competence.

A note on the epistemology of medical competence

Epistemology is the philosophy of knowledge, which studies its nature, origin, sources, justifications, and the sense of truth. In different domains, different epistemic frameworks are used. In mathematics, logical deduction can yield truths that are undisputed. In social sciences, ‘truths’ are less obvious and often determined by convictions that are not always shared. In health care, a domain somewhere in between, a body of knowledge exists that can be considered undisputed (‘the organ between the esophagus and the duodenum is the stomach’) but other instances of knowledge (‘patient X in room Y is very sick’) may be debatable or influenced by a personal

^a In this chapter, when we say ‘medical’ we expressly mean to include all professions in the healthcare domain.

frame of reference. Epistemology distinguishes propositional knowledge (knowing that) from procedural knowledge (knowing how) and knowledge by acquaintance (knowing from personal experience^b). ‘Truths’ can vary from totally undisputed, shared beliefs to probabilistic and highly contextual propositions. In medicine, shared convictions based on published evidence grow into ‘truths,’ because these convictions justify the actions and decisions that ‘must’ be made (for ‘best’ treatment, for referral, for next investigations, etc.). They are based on research findings, usually with confidence intervals to make them plausible rather than absolute.

When we say that trainees must acquire competence to be assessed for license, it is useful to distinguish between propositional and procedural knowledge. Without procedural knowledge (*how to* knowledge), propositional knowledge alone would not suffice for clinical practice. Knowing what to do may require propositional knowledge but also requires procedural knowledge and often experiential knowledge (‘I know what to do because I have seen or done this before’). More than with propositional knowledge, procedural knowledge is not absolute and is affected by contextual, ethical, biographical, and sometimes even political considerations. What to do, for instance, when a critically ill patient arrives for intensive care when all IC beds are filled with critical Covid-19 patients? *Knowing what to do* belongs to the physician’s assumed knowledge base but does not imply absolute truths, because contextual variations can make circumstances unpredictable. Similarly, on a meta level, educators must know when to begin entrusting a trainee with critical responsibilities, ‘knowing’ that the trainee will know what to do, depending on the circumstances. Entrustment decisions involve trust, that is, an estimation of a trainee’s capacity to adapt and manage unfamiliar situations.

Medical competence as a multilayered construct

The origin of competency-based medical education lies strongly in behaviorist thinking. In the 1950s and 1960s, the dominant movement toward behavioral objectives for education stemmed from the reasoning that education must lead to measurable results of predefined objectives.^{11,12} Bloom created a model of knowledge, skills, and attitudes that has influenced most of the education in the world^{13,14} and certainly health professions education. In addition, his mastery learning concept¹⁵ strongly influenced the idea that deliberate effort can bring all trainees to predefined standards of competence, with sufficient motivation, time, and practice opportunities, as Ericsson and McGaghie and his colleagues have shown.^{16–18} However, if sufficient medical competence is regarded as a condition to entrust trainees and professionals with privileged health care tasks, competence may be defined more broadly than skills that grow through deliberate practice. Entrustment decisions are not easily made solely upon passing standardized tests. Observing trainees in clinical workplaces reveals components of competence that would go unnoticed in written examinations,¹⁹ such as how a trainee connects with a patient and explores and interprets their medical history, and for which expert judgment is needed.²⁰ This more holistic approach to workplace-based assessment of competence is relatively new.²¹ Indeed, the process of professional identity formation, whereby trainees come to think, act, and feel like physicians²² (or other health professionals), is not easily captured in a competency framework.²³

^b Knowledge by acquaintance as one of the components of epistemology was defined by Bertrand Russell as ‘knowledge of which we are directly aware, without the intermediary of any process of inference or any knowledge of truths.’ It is strictly not identical to experiential knowledge (which may include inferences) but close enough to distinguish from propositional and procedural knowledge. In medical education, experiential knowledge (even sometimes without full awareness) is a more commonly used construct that we will use in this chapter. See Dings (2023) for a deeper discussion.¹⁰

In 2024, ten Cate et al. proposed medical competence as a construct with three layers, each with different implications for standards and assessment: a canonical layer, a contextual layer, and a personalized layer.⁹ In the summary below we explain how EPAs and entrustment decision-making are situated within the contextual layer of competence.

Canonical layer of competence. Medicine and other health professions cannot be practiced without a thorough knowledge of at least anatomy, physiology, and pathology—that is, within the current body of knowledge, undisputed and generalized across the contexts, cultures, and countries in which patient care is practiced. This is knowledge that can be acquired through reading, listening, discussion, and other educational methods, and that can be tested with written or online methods. This is largely propositional knowledge, but some procedural knowledge belongs to the canon, such as the application of knowledge in clinical reasoning. Basic physical skills, including the examination of patients, and even foundational principles of ethics and professional behavior may be assumed to be canonical, that is, ‘what everyone of the profession should know or be able to do,’ independent of the context. Standards of expected competence at this layer can be defined, and the assessment can meet established criteria of psychometric quality to enable confidence that candidates who pass indeed possess the required canonical competence. In other words, this speaks to the ‘knows,’ ‘knows how,’ and ‘shows how’ levels of Miller’s pyramid.²⁴

Contextual layer of competence. Possessing canonical competence is insufficient to practice health care. While the classroom is not the only place to acquire canonical competence, the step to the application of knowledge in practice has always been considered a significant and difficult transition for medical students.²⁵ It requires a different way of thinking (problem- and action-oriented, rather than systematic and reproductive) and because clinical contexts have unique and thus different intricacies. It also requires adaptive competence,²⁶ further complicated by continuous changes within the ecology of the clinical environment itself in response to outside pressures or changed needs of health care.²⁷ Working in clinical contexts thus requires a different type of competence, including an ability to apply canonical competence in a variety of circumstances. This important layer of competence is more difficult than canonical competence to capture through standards and assessment processes. No one would entrust a graduate from a medical program, solely based on passing all exams, if they have never attended to a patient. A phase of clinical experience is indispensable, and requires more experienced colleagues (attending, consultants, supervisors, and others) to confirm their readiness for unsupervised practice. Central in the assessment of contextual competence is the notion of entrustment. If a credible group of health professionals, familiar with the context, confirms that essential patient care activities can be *entrusted* to a trainee to perform with minimal supervision, standards can be considered to have been met. This notion requires quite a different approach to standard setting and assessment, as fair and valid decisions of entrustment require grounding in data from observation. Yet entrustment implies acceptance of risk, caused by a level of unpredictability of future situations. This in turn implies that absolute standards of competence do not hold in this layer of competence. Standards must comply with local rules, protocols, culture, and patient populations, and trainees must be evaluated with local sources of information, including experts who form judgments.

Personalized layer of competence. Following Billett,²⁸ we recognize that the competence of an individual professional reflects not just the possession of canonical knowledge and skills and the ability to practice health care according to standards but also includes style, insights, specific skills, interests, habits, and convictions that make a professional unique. While standards of canonical and contextual competence must be met to permit unsupervised practice, professionals can differ in their competence in a personal manner, above and beyond these standards. The constructivist view on education and development posits that humans actively construct new insights on a foundation of existing knowledge. They have ontogenetically (i.e., through their histories) shaped knowledge from learning and personal experiences, mediated by sensory, neural, and cognitive systems, in interaction with a social environment.²⁸ Vygotsky, the Russian developmental

psychologist (1896–1934) who coined the term ‘zone of proximal development’ and contributed to cultural-historical activity theory, also elaborated on the concept of *perezhivanie*, which explains this idea of personal development well. *Perezhivanie*, in this context, can be best translated as the subjectivity which makes individuals unique in their creative performance, being the resultant of the combined cognitive and emotional experiences, built across one’s lifetime, integrated in the long-term memory, and informing one’s frame of reference in viewing the world.^{9,29,30}

This sounds highly theoretical, but examples may help to understand it. It is essential that clinicians communicate compassionately with patients. While there are ‘key features’ to compassionate communication (i.e., listening, sitting, eye contact), the way in which clinicians interact with patients will vary between individuals and is shaped by their personal voice, style, experience, and identity. The ability of the physician to communicate their compassion effectively and authentically will affect patient satisfaction, and in some cases the outcomes of care. Or a clinician with a sound fund of knowledge may encounter adverse events in clinical practice,³¹ leading to strong emotions that shape their individual style and convictions in subsequent clinical judgment and practice. This is why the *perezhivanie* of one person can never be fully understood by others, as Vygotsky contended when studying artistic excellence.³⁰ The personalized layer of clinical competence adds a component that can be conceived of as the art of clinical practice, by the personal touch of the individual professional. It also brings us back to epistemology. The ‘epistemic framework’ of the individual is a personal system of knowledge and thought, rarely made explicit. Barreiro and Castorina distinguish ‘excisional’ and ‘relational’ views of epistemic frameworks,³² and argue that the excisional view (i.e., viewing individual knowledge as disconnected from the social environment) disregards the strong social and development psychologists’ arguments (including from Vygotsky and Piaget) that nature, society, and culture affect one’s epistemic framework in continuous interaction.

Setting standards for the assessment of the personalized layer of competence does not make sense, because legitimate diversity and differences between individual professionals characterizes this layer. However, the individual’s *pursuit* of expansion of this layer may be valued and rewarded. This is, to some extent, captured in the Accreditation Council for Graduation Medical Education’s competency domain of ‘Practice-Based Learning and Improvement,’ which has been defined as ‘the ability to investigate and evaluate one’s care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.’⁶ The effort may be valued but the desired result cannot be standardized.

A hierarchical model, but not fully sequential

The model, as depicted in Figure 2.1, is hierarchical in nature but not fully sequential. That is, contextual competence requires a canonical foundation because, when the application in a context

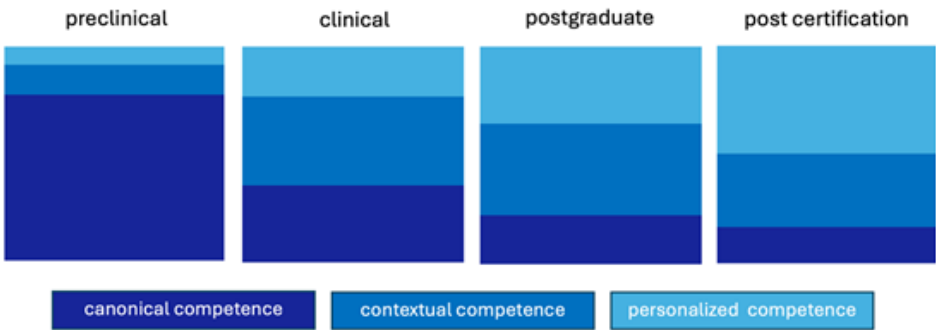


Figure 2.1: Visualization of the multilayered competence model across the continuum.

occurs, there must be something present to apply. Similarly, a personal style of practice, developed across a period of experience, requires a level of confidence that is often acquired in the first years after formal training. These years are known to be very demanding, when junior attendings or consultants are occupied by the desire and urge to meet all professional expectations and still encounter new challenging situations³³. A more relaxed phase of 'self-actualization' or the fulfillment of personal potential follows later, a state that, as proposed by Maslow, is reached after other needs have been satisfied (physiological, safety, love and belonging, esteem, competence, and aesthetic needs).³⁴ This happens when one feels mastery of one's domain of practice. An analogy with jazz music can help. Before being sufficiently skilled to improvise on a melody, the musician must first master the instrument, then know the basic melody at stake and understand its associated chords and harmonies, and also acquaint themselves with fellow musicians and other components of context. However, the hierarchical nature of the model is not meant to suggest that all canonical competence must first be mastered before contextual competence is acquired, with personalized competence finally emerging only at the end. On the contrary, vertical integration in medical curricula, which includes early acquaintance with clinical contexts while the teaching of the canon of basic sciences remains ongoing, has shown benefits for cognition and motivation.³⁵ Likewise, the seeds of personalized competence can be sowed early, when students explore and discover personal strengths and interests that guide career choices and that may eventually merge personal identity with professional identity.

The model thus addresses the tensions between the need for standardized assessment of competence to allow for access to the practice of health care, and the acknowledgment that professionals are unique, and that diversity must not only be tolerated but genuinely valued and supported. It provides a place for identity formation in competency-based education²³ and aligns with medical curricula that stress the knowing, doing, and being of health professionals.³⁶

Implications for EPAs and entrustment

Within this model, entrustment decision-making typically aligns with assessment of the contextual layer of competence. Summative entrustment decisions, with critical impact for both patient safety and trainee progress, typically focus on thresholds, such as readiness for unsupervised practice (in postgraduate contexts) or for indirect supervision (undergraduate). While the stakes in assessment of canonical competence typically regard trainee progress, in the assessment of contextual competence the protection of patients is also a critical component. 'High-stakes decisions' therefore have a wider connotation in contextual competence. They must include an estimation of risks for patient safety, which is a prospective judgment.³⁷ Entrustment decisions must be based on more than technical skills (including interpersonal techniques). Ten Cate and Chen¹⁹ have argued that, besides capability (activity-specific knowledge, skill and experience, and adaptive expertise), four general features are relevant: integrity (truthful, good intentions, patient-centered), reliability (conscientious, predictable, accountable, responsible), humility (observing limits, willing to ask help, receptive to feedback), and agency (self-confident, proactive toward work, team, safety, and self-regulation). This array of features requires thoughtful consideration by observers, dialogues with trainees, and negotiations within clinical educator teams to arrive at intersubjective judgment and decisions. Here is where epistemology theory also becomes relevant. Epistemic humility refers to the limitations of knowledge, and acknowledges that decisions, such as in patient care, can not always be justified as being completely right or wrong.³⁸ Decisions of entrustment regarding trainees similarly involve a leap of faith (small or big) that supervisors and teams need to consider with some epistemic humility. Entrustment with patient care tasks requires a more holistic picture than rating scales can offer. The binary entrustment decision (yes or no) is a holistic decision that combines the evaluation of competence, the gauging of risks, and the granting of

autonomy, and can only be made by examiners who know the trainee and who have the authority for patient care in the context of interest. The information determining the decision thus combines contextual features with trainee features. All features can weigh in but there is no formula to predict the outcome of the decision.

While the training and assessment of competence at the canonical layer is basically not individualized, the training and assessment of contextual competence is individualized. Competency-based curricula for the acquisition of contextual competence require sufficient flexibility and time-variability for all trainees to meet contextual standards, i.e., entrustment with all relevant EPAs, regardless of the time needed (albeit within limits).³⁹

Finally, how does personalized competence relate to entrustment decision-making? While we have contended that decisions of readiness to practice require standards of canonical and contextual competence, not standards of personalized competence, there are two relationships with personalized competence. The first relates to the assessor or supervisor. Their own art and style of professional practice, fueled by their *perezhivanie*, includes not only the art of patient care but also the observation and assessment of trainees, and includes convictions about assessing quality of practice. Superb assessors, however, employ some epistemic humility in their judgment, by realizing their own limitations of knowing what is 'best.' The second relates to the trainee. Allowing the trainee to deviate within the margins of acceptable care, and assessing them with this view in mind, can contribute to the trainee's development of a personalized competence.

These three layers of competence together establish the conditions to think, act, and feel like a health professional⁴⁰: the knowing, the acting, and the being.³⁶

Acknowledgments

This chapter draws substantially from an article published in *Medical Education* and a public lecture by the first author on August 31, 2023.^{9,41}

Competing interests

The authors declare that they have no competing interests.

Figure reprint

Figure 2.1 was reprinted from ten Cate et al. (2024), an open access publication with copyright residing with the authors.

References

1. Epstein RM, Hundert EM. Defining and assessing professional competence. *JAMA*. 2002;287(2):226–235. DOI: <https://doi.org/10.1001/jama.287.2.226>
2. Frank JR, Jabbour M. *Skills for the new millennium: report of the Societal Needs Working Group CanMEDS 2000 Project*. Royal College of Physicians and Surgeons of Canada.; 1996:1–21.
3. Frank JR, Snell L, Sherbino J. *CanMEDS 2015 Physician Competency Framework*. The Royal College of Physicians and Surgeons of Canada; 2015:36.
4. Swing SR, International CBME collaborators. Perspectives on competency-based medical education from the learning sciences. *Med Teach*. 2010;32(8):663–668. DOI: <https://doi.org/10.3109/0142159X.2010.500705>

5. Pangaro L, ten Cate O. Frameworks for learner assessment in medicine: AMEE Guide No. 78. *Med Teach*. 2013;35(6):e1197–1210. DOI: <https://doi.org/10.3109/0142159X.2013.788789>
6. 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):1088–1094. DOI: <https://doi.org/10.1097/ACM.0b013e31829a3b2b>
7. Grant J. The incapacitating effects of competence: A critique. *Adv Health Sci Educ Theory Pract*. 1999;4(3):271–277. DOI: <https://doi.org/10.1023/A:1009845202352>
8. Brooks MA. Medical education and the tyranny of competency. *Perspect Biol Med*. 2009;52(1):90–102. DOI: <https://doi.org/10.1353/pbm.0.0068>
9. ten Cate O, Khursigara-Slattey N, Cruess RL, Hamstra SJ, Steinert Y, Sternszus R. Medical competence as a multilayered construct. *Med Educ*. 2024;58(1):93–104. DOI: <https://doi.org/10.1111/medu.15162>
10. Dings R. Experiential knowledge: from philosophical debate to health care practice? *J Eval Clin Pract*. 2023;29(7):1119–1126. DOI: <https://doi.org/10.1111/jep.13845>
11. Tyler RW. *Basic Principles of Curriculum and Instruction*. University of Chicago Press; 1949.
12. Mager RF. *Preparing Educational Objectives*. 3rd ed. David S. Lake Publishers; 1984:1–136.
13. Bloom BS, Engelhart MD, Furst EJ, Hill WH, Krathwohl DR. *Taxonomy of Educational Objectives: The Classification of Educational Goals; Handbook I: Cognitive Domain*. Longmans, Green; 1956.
14. Krathwohl DR, Bloom BS, Masia BB. *Taxonomy of Educational Objectives: The Classification of Educational Goals; Handbook II: Affective Domain*. David McKay Co, Inc; 1973.
15. Bloom BS. *Learning for Mastery. Instruction and Curriculum*. Evaluation Comment UCLA. 1968.
16. McGaghie WC, Miller GE, Sajid AW, Telder TV. *Competency-based curriculum development in medical education: an introduction*. WHO. Public Health Pap. 1978;(68):11–91.
17. McGaghie WC. Mastery learning: it is time for medical education to join the 21st century. *Acad Med*. 2015;90(11):1438–1441. DOI: <https://doi.org/10.1097/ACM.0000000000000911>
18. Ericsson KA. Acquisition and maintenance of medical expertise: a perspective from the expert-performance approach with deliberate practice. *Acad Med*. 2015;90(11):1471–1486. DOI: <https://doi.org/10.1097/ACM.0000000000000939>
19. ten Cate O, Chen HC. The ingredients of a rich entrustment decision. *Med Teach*. 2020;42(12):1413–1420. DOI: <https://doi.org/10.1080/0142159X.2020.1817348>
20. ten Cate O, Regehr G. The power of subjectivity in the assessment of medical trainees. *Acad Med*. 2019;94(3):333–337. DOI: <https://doi.org/10.1097/ACM.0000000000002495>
21. Schuwirth LWT, van der Vleuten CPM. A history of assessment in medical education. *Adv Health Sci Educ Theory Pract*. 2020;25(5):1045–1056. DOI: <https://doi.org/10.1007/s10459-020-10003-0>
22. Cruess SR, Cruess RL, Steinert Y. Supporting the development of a professional identity: general principles. *Med Teach*. 2019;41(6):641–649. DOI: <https://doi.org/10.1080/0142159X.2018.1536260>
23. Sternszus R, Slattey NK, Cruess RL, ten Cate O, Hamstra SJ, Steinert Y. Contradictions and opportunities: reconciling professional identity formation and competency-based medical education. *Perspect Med Educ*. 2023;12(1):507–516. DOI: <https://doi.org/10.5334/pme.1027>
24. Miller GE. The assessment of clinical skills/competence/performance. *Acad Med*. 1990;65(9 Suppl):S63–S67. DOI: <https://doi.org/10.1097/00001888-199009000-00045>
25. O'Brien BC, Poncelet AN. Transition to clerkship courses: preparing students to enter the workplace. *Acad Med*. 2010;85(12):1862–1869. DOI: <https://doi.org/10.1097/ACM.0b013e3181fa2353>
26. Teunissen PW, Watling CJ, Schrewe B, et al. Contextual competence: how residents develop competent performance in new settings. *Med Educ*. 2021;55(9):1100–1109. DOI: <https://doi.org/10.1111/medu.14517>

27. Ellaway RH, Bates J, Teunissen PW. Ecological theories of systems and contextual change in medical education. *Med Educ.* 2017;51(12):1250–1259. DOI: <https://doi.org/10.1111/medu.13406>
28. Billett S. Developing domains of occupational competence: workplaces and learner agency. In: Mulder M, ed. *Competence-Based Vocational and Professional Education. Vol 23. Technical and Vocational Education and Training: Issues, Concerns and Prospects.* Springer International Publishing Switzerland; 2017:47–66.
29. Fleer M, González Rey F, Veresov N, eds. *Perezhivanie, Emotions and Subjectivity*; vol 1. Springer Singapore; 2017. DOI: <https://doi.org/10.1007/978-981-10-4534-9>
30. González Rey F. Vygotsky's concept of *Perezhivanie* in *The Psychology of Art* and at the final moment of his work: advancing his legacy. *Mind, Culture, and Activity.* 2016;23(4):305–314. DOI: <https://doi.org/10.1080/10749039.2016.1186196>
31. Helo S, Moulton C-AE. Complications: acknowledging, managing, and coping with human error. *Transl Androl Urol.* 2017;6(4):773–782. DOI: <https://doi.org/10.21037/tau.2017.06.28>
32. Barreiro A, Castorina JA. Dialectical inferences in the ontogenesis of social representations. *Theory Psychol.* 2017;27(1):34–49. DOI: <https://doi.org/10.1177/0959354316681863>
33. Teunissen PW, Westerman M. Junior doctors caught in the clash: the transition from learning to working explored. *Med Educ.* 2011;45(10):968–970. DOI: <https://doi.org/10.1111/j.1365-2923.2011.04052.x>
34. Maslow AH. A theory of human motivation. *Psychol Rev.* 1943;50(4):370–396. DOI: <https://doi.org/10.1037/h0054346>
35. Wijnen-Meijer M, van den Broek S, Koens F, ten Cate O. Vertical integration in medical education: the broader perspective. *BMC Med Educ.* 2020;20(1):509. DOI: <https://doi.org/10.1186/s12909-020-02433-6>
36. Boland J, Offiah G. *Curriculum Framework for the Internship Programme in Ireland.* Health Service Executive; 2023.
37. ten Cate O. Entrustment as assessment: recognizing the ability, the right, and the duty to act. *J Grad Med Educ.* 2016;8(2):261–262. DOI: <https://doi.org/10.4300/JGME-D-16-00097.1>
38. Schwab A. Epistemic humility and medical practice: translating epistemic categories into ethical obligations. *J Med Philos.* 2012;37(1):28–48. DOI: <https://doi.org/10.1093/jmp/jhr054>
39. Schumacher DJ, Caretta-Weyer H, Busari J, et al. Competency-based time-variable training internationally: ensuring practical next steps in the wake of the COVID-19 pandemic. *Med Teach.* 2021;43(7):810–816. DOI: <https://doi.org/10.1080/0142159X.2021.1925098>
40. Merton RK, Reader RG, Kendall P. *The Student-Physician: Introductory Studies in the Sociology of Medical Education.* Harvard University Press; 1957:1–371.
41. ten Cate O. Health professions education: retrospective and prospective. Lecture at the Occasion of Completion of the Professoriate in Medical Education at Utrecht University, August 31, 2023; Utrecht University/UMC Utrecht, the Netherlands.