

Learning in Practice: A Valuation of Context in Time-Variable Medical Training

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Abstract

The logical consequence of implementing competency-based education is moving to time-variable training. Competency-based, time-variable training (CBTVT) requires an understanding of how learners interact with their learning context and how that leads to competence. In this article, the authors discuss this relationship. They first explain that the time required to achieve competence in clinical practice depends on the availability of clinical experiences that are conducive to ongoing competence development. This requires both curricular flexibility in light of the differences in individual learners' development and a balance between

longitudinal placements and transitions to different environments.

Along with the deliberate use of the opportunities that learning environments offer, there is value for learners in spending ample time-in-context. For instance, guided independence is possible when trainees do not progress immediately after meeting curricular learning objectives. Next, the potential implications of CBTVT can be illustrated by two learning perspectives—Sfard's acquisition and participation metaphors—which leads to the assertion that competence is both an individual characteristic and a quality that emerges

from a purposeful social interaction between individuals and their context. This theory recognizes that the deliberate use of context could be used to approach learning as acquiring collective competence.

Based on this relationship between learner, context, and competence, the authors propose an approach to CBTVT that recognizes that all learners will have to meet a number of standard preset learning targets in their workplace, while still having room for further context-specific competence development and personal growth within strategically organized learning environments.

The introduction of competency-based medical education has opened up the discussion on how long undergraduate and graduate medical education need to be. Before the advent of the competency-based model, time-in-training was fixed; after completing the required training time—for instance, for surgical training—a resident would qualify as a surgeon. This practice is still prevalent today, but, with its focus on assessable learning outcomes, competency-based education has allowed us to see time not as a constant but as a variable. It also enables us to envision a model where progress in training is based on observed competence, independent of the time required to reach that level of competence. One might even argue that time-variable training is the

logical consequence of competency-based education.¹ While there are good reasons to rethink setting a fixed time for the training of all learners, making time-in-training a function of the obtained outcomes of individual learners is an alternative that needs careful consideration. Understanding what health care practices actually offer our learners is key to discussing this alternative. To move the debate on competency-based, time-variable training (CBTVT) forward, educators and learners must come to appreciate the role of context and time-in-context in the development of learners. Context is a multifaceted concept that includes all features of the environment in which health care professionals work and learn.²

The discussion about CBTVT in medicine relates not exclusively but predominantly to learning within clinical settings, which will be the focus of this article. Clinical learning experiences vary much more than classroom education, as the context of those experiences is to a large extent different for every learner.³ That is not only because every individual perceives the world differently but also because patients, colleagues, and circumstances,

such as hospital admissions capacity, differ on a daily basis. This variability in context is an inherent part of workplace learning. The goal of that learning is not only mastering the clinical content of a profession but also learning how to work in variable and changing contexts. Health care practices, therefore, are both authentic and somewhat chaotic learning environments.

To yield the optimal learning benefit, competency-based education has sought to provide structure in the form of explicit learning outcomes.⁴ The increased structuring and formalization of workplace learning in health care, by defining required (sub)competencies learners need to obtain and ways of assessing these prespecified outcomes, has gone hand in hand with an increased focus on the costs of training, patient safety, and transparency of learning outcomes.⁵ These issues come together in the current debate on time-variable training in medical education. To add to that debate, we focus on an area that cuts across these issues: the relationship between context and learning. We draw on recent conceptualizations of workplace learning to argue that learning-in-context entails more than

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the acquisition of clinical expertise and includes features that have not been, and may never be, captured in formalized, competency-based curricula. We then discuss the implications of this assertion for our approach to education in health care workplaces and consequently to the debate on CBTVT.

The Deliberate Use of Context for the Purpose of Learning

Learning in the clinical workplace typically combines a deliberate curriculum, aimed both at developing relevant competencies such as medical expertise and at increasing independence, with what has been called the hidden curriculum. The hidden curriculum refers to the cultural mores that are transmitted, but not openly acknowledged, through formal and informal educational practices.⁶ Effective CBTVT requires more purposeful alignment between explicit curricular goals and the opportunities and expectations that are now part of the hidden curriculum. The hidden curriculum is often context specific and may have constructive components, such as when contexts are valued for their positive and unique contributions to learners' development.⁷ This means that clinical educators need to be acutely aware of the effects of the hidden curriculum on learners in their workplaces and how these experiences influence learning trajectories for individual learners.⁸

Currently, contexts and the experiences they potentially offer are often part of fixed rotation schedules and are not adjusted according to learners' needs. In theory, to increase curricular flexibility, trainees could strategically be put in contexts that both support and challenge particular competencies. For instance, contexts could be conceptualized not only as having a clinical focus (e.g., core pediatrics, critical care) but also as being conducive to the development of leadership or communication competencies, for instance. Deliberately choosing to include different workplace dynamics in a curriculum could achieve this goal by strategically manipulating the relational continuity or fluidity among team members (e.g., the stable team membership of a pediatric burn unit vs. the fluid team membership of an internal medicine ward). Trainees could arguably benefit from experiencing

variable contexts according to a conscious educational strategy rather than a fixed rotation schedule.⁹

The limitations of workplace learning also become evident with the realization that the time required to achieve competence in clinical practice depends on the provision and availability of varied clinical experiences that can lead to ongoing development. Experiences can be far from optimal. Indeed, clinical education, particularly in tertiary hospitals, suffers increasingly from the fragmentation of disciplines; short patient stays; frequent handoffs; short rotations; and inadequate supervision, observation, and teaching—all of which can negatively impact learning.^{10,11} To counteract these negative aspects of a fragmented learning experience, Hirsh et al¹² recommended continuity as an organizing principle of clinical education. Moving from short rotations to longitudinal experiences enables better guidance, assessment, and trust between preceptors and trainees, which in turn fosters better possibilities for the progression of learners.^{13–15} However, adaptive expertise has been stressed as an important 21st-century skill for graduates to enable them to cope with a variety of contexts and unfamiliar situations.^{16–18} Training to develop this skill would require experience in a variety of clinical settings. Further research is needed to establish the optimal mix of longitudinal placements and transitions between rotations for the majority of learners, so they can benefit from longer relationships with patients and preceptors while still being able to learn how to navigate changing contexts.

The Value of Time-in-Context

Regardless of the deliberate use of context for the purpose of learning, recognizing the value of time-in-context is important in discussions of CBTVT. Variation in the time needed to attain learning objectives may permit those learners who are relatively fast to use their remaining time in a clinical environment for the refinement and maturation of more sophisticated and nuanced capabilities. The direction of such further development will vary between different learner–context combinations. For instance, if surgical trainees have acquired the technical competencies associated with general surgery, they

could focus more on the relational and social aspects of their situated expertise, such as negotiating postoperative management with other specialties or leading family meetings in challenging clinical situations. Despite the efforts of competency-based educational models, learners struggle to attend to such relational dimensions of clinical practice until they have mastered the biomedical and technical dimensions.^{19,20}

Even for trainees who do not need to develop specific competencies, there is value in spending additional time practicing in the context in which they have reached the required level of competence and maturity necessary for relatively independent practice. This time has been called “dwell time”^{14,21,22} or “tea steeping,”²³ which erroneously suggests that a learner's development is idle during this period or that it happens unguided. In contrast, we characterize this phase as a supported transition to independence, which can add significantly to the development of well-prepared professionals. It may be deliberately organized as reflective periods strategically inserted into a curriculum to foster critical reflection and the integration of knowledge, techniques, and their application to experiential learning. As these relationships develop for a learner who has gradually moved from a peripheral participant to a full participant in the community of practice, new learning opportunities emerge.²⁴ The first opportunity relates to self-efficacy. Meeting standards may not always translate into learner confidence. But if a trusting relationship has developed, supervisors may support their learners in practicing independently, which presents the opportunity for learners to develop a sense of self-efficacy.¹⁴ This period may not be specifically focused on developing new competencies but instead on consolidating existing performance and growing confidence.

The second learning opportunity has to do with the experience of failure. In the initial period after being entrusted with a professional activity, a learner's fragile sense of certainty may be shattered by a mistake or a negative patient outcome. With an increase in the volume of independent practice, it is inevitable that there will be times when a young professional has to take responsibility for something that did not go as intended.

This may be something seemingly minor, such as a laboratory test that was not ordered or a diagnostic error leading to prolonged suffering. Or it may be a major calamity, such as a surgical complication resulting in harm to a patient. For trainees, it is important to experience some of these initial moments of struggle in a context where they have the established relationships in place for both guided independence and mentored reflection.²⁵ In such a context, trainees would have the social support of colleagues they know, the advice of a supervisor who can act as a mentor or coach, and the certainty that they had been entrusted with caregiving for that patient. Such opportunities seem to fit better with longer placements than shorter ones.

How we teach young doctors to cope with the emotional, organizational, and potential legal ramifications of situations that go awry will impact the rest of their careers. Helping physicians deal with challenges maturely and constructively and develop strategies for resiliency is possible only when there is the time and trust in place for such learning opportunities. These more or less unexpected events are important, take time, and are unpredictable. Time-in-context, therefore, is a necessary condition for such events to emerge. A CBTVT model needs to take into account this additional time-in-context dimension of individuals' development after they have attained the generic and specialty-specific curricular goals that relate to that particular training context.

Exploring Conceptions of Competence

Up to this point, we have mainly focused on the relationship between individuals' development of competence and the context of their learning. We have argued that context could be deliberately organized to contribute to learner development, and we have highlighted the importance of ample time-in-context for guiding individuals toward independence. To further advance the discussion on CBTVT, we will more deeply examine conceptions of learning in clinical contexts. Sfard's²⁶ distinction between an *acquisition* and a *participation* metaphor highlights the consequences of different perspectives on workplace learning.

Sfard's work focuses on the relationship between thinking and communicating. In a seminal 1998 paper, she described two metaphors of learning. First, an *acquisition* metaphor focuses on individual, cognitive, and technical-rational aspects of learning. This metaphor positions us to frame the discussion on CBTVT as a matter of individuals attaining required objectives while the educational system adjusts to their differing paces of attainment. Consequently, the role of context—the organizational system, the clinical unit, and the health care team—is treated as a temporal and spatial backdrop. The acquisition metaphor of learning is recognizable in many aspects of medical education. It is exemplified, for instance, by a fixed set of learning objectives for all trainees in a program regardless of their specific workplace setting. The pursuit to ensure that all learners attain fixed, standard objectives in a competency-based medical education model may increase pressure on learning contexts to become more uniform, especially if we move toward a CBTVT model where progress solely depends on attaining these standard objectives. Not only is increasing uniformity of context artificial in a world of richly diverse clinical workplaces but it also risks robbing clinical training of a powerful tool for advancing learner competence—the variability of workplace contexts.³

In contrast, Sfard's²⁶ *participation* metaphor approaches learning as situated, relational, and participatory and context as an integral component of learning. Theories of participatory learning have also informed medical training.^{27,28} Each workplace context offers unique learning opportunities, and research shows that trainees learn what a workplace has to offer through the experience of participating in patient care, regardless of what is included in the formal, written curriculum.^{3,29} From this perspective emerges the notion that competence lies in the relationship between the learner and the situated exigencies of the work, including patient presentations, collaborative interactions, and organizational structures and policies. Generally, these conceptualizations of workplace learning go beyond the boundaries of an individual's cognition.³⁰ They recognize the importance of the social nature of meaning making, the contextual

influences on learners' developmental trajectories, and the plethora of cultural experiences in which learners are embedded.^{3,24} Adding this participatory orientation to discussions of CBTVT sets up the potential for programs to capitalize on contextual variation and to expect and support learners in recognizing and developing the context-bound competence that their practice context requires of them.

These two metaphors help us to understand an underlying tension that runs through the debate on CBTVT—is competence an individual characteristic, or is it a quality that emerges from a purposeful social interaction between individuals and their context? Related to this tension is the issue of the extent to which competence can be captured in individual learning objectives laid down in a curriculum. A reasonable way forward would be to accept both options or at least not to reject either option. This would require a model of competency-based education that both aims for individual attainment of standardized competencies and accepts that clinical environments offer unique collaborative learning opportunities. Practically, in light of CBTVT, it could mean creating a standardized set of minimum outcomes which learners can expand on and refine according to the context-specific opportunities afforded in their practice settings. However, in discussing models of CBTVT, we should be cognizant that this system could be a tool that allows learners to flexibly use training time so they can benefit from the uniqueness of a workplace, but it also could potentially result in increased uniformity of assessment and learning outcomes and devalue workplaces as unique learning environments.

Context-Driven Learning and CBTVT

Finally, we highlight the implications for learning and CBTVT when we accept that competence is not only an individual attribute but also a quality that emerges from a purposeful social interaction between individuals and their context. It requires us to adopt the perspective that education is as much about generating meaningful experiences as it is about attaining individual competence.³¹ Strategically selecting contexts to create experiences that support and challenge

learners could begin to approach what has been called “collective competence” or the degree to which learners can recognize their place in the larger system of a unit or team and strategically adapt their behaviors according to features such as team (in)stability and trust.³² The experience of participating in different kinds of team contexts could also be considered and strategically organized to advance learning; teams range from discipline specific (e.g., medicine) to interdisciplinary (e.g., family health team), and from colocated (e.g., operating room) to distributed (e.g., palliative care). Using contexts strategically to expose and support such experiences could inculcate in learners an awareness of these differences between teams and systems of care and encourage learners to apply and adapt their skills in communication and collaboration accordingly. In theory, an educational model aimed at placing learners in environments with a high probability of meaningful experiences has no clear time limit. The gradual decline of the probability of encountering new and meaningful experiences could be an indicator that it is time to move on to a new learning environment. This insight could be combined with having attained a minimum set of standard learning objectives for that placement, leading to a model of CBTVT that encompasses both an acquisition and a participation metaphor of learning.

Finally, building on the importance of clinical contexts for learning, we must be aware of the possible impact of a model where learners potentially move faster or slower through rotations, as this might affect the composition of teams in clinical learning environments. Clinical training is, to a large extent, dependent on interactions within social teams of learners that provide peer and near-peer support and learning.²⁹ Highly individualized time variability could reduce the number of competent learners available for (near-) peer teaching if more experienced learners quickly move on to other contexts. In addition, teams would then generally have more novice members. Therefore, time variability, particularly early completion of training, not only influences an individual learner but also influences the learning environment by removing competent learners who could have contributed to teaching more novice team members.

Conclusion

CBTVT brings to the fore a debate on how the medical education community approaches context, learning, and competence. If we treat context only as a backdrop for learning, then we potentially rob our learners of valuable context-related learning opportunities. Herein lies a challenge for medical educators and learners. CBTVT models should not treat the curriculum as a set of learning targets that, once obtained, allow learners to move on to new contexts. That would risk an erosion of the quality of medical education and of health care practices as environments for training. We propose an alternative that recognizes that all learners will have to meet a number of standard, preset learning targets in their workplace but that leaves room for further context-specific competence development and personal growth within learning environments that have been strategically organized. This model will probably involve a balance between longer placements and shorter rotations, but it would provide learners with enough time-in-context to attend to relational and social competences. The CBTVT model also contributes to building the collective competence of a team by offering learning opportunities outside the realm of learners’ individual competencies. Shorter rotations could be selected specifically for the nonclinical learning opportunities they offer and to help trainees learn to deal with change and adaptability. We contend that using context as an educational strategy rather than a spatial backdrop promises to strengthen CBTVT.

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