The Future of Competency Based Learning and Workplace Based Assessment in Medical and Health Education

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Medical and health education is constantly evolving to meet changing societal needs. This is a process that takes time, dedicated energy, and appropriate resources. In Canada, the Future of Medical Education in Canada (FMEC-MD) report recommends transformative changes in undergraduate medical education, beginning with a competency–based approach, and addressing the key areas of leadership, community needs, admissions process, scientific basis, prevention and public health, hidden curriculum, learning context, generalism, and inter/intra–professional practice.[1] Along the continuum of health education, the Future of Medical Education in Canada Postgraduate Project (FMEC-PG) report on residency education makes similar recommendations.[2] Specifically, the renewal of postgraduate curricular structures and assessment methodologies are well under way for family medicine residency training (Triple C competency–based curriculum) and specialties residency training (Competence By Design).[3,4] The implementation of the latter follows a phased approach across the 17 medical schools in Canada, beginning with two specialties in 2017, six in 2018, and ramping up to twelve in 2019.[5] More specialties will be implemented in years to come, and complete implementation is anticipated to span across a decade. The transformation to competency–based learning provides a unique opportunity to seamlessly align undergraduate and postgraduate medical education, which in turn empowers students to progress and transition successfully into the various phases of their career trajectories. Similarly, the Future of Medical Education in Canada Continuing Professional Development Project (FMEC-CPD) report also recommends a competency–based approach for post–training, lifelong learning.[6] The status quo of time–based learning has therefore begun to shift to competency–based learning, representing a much–needed paradigm shift. The overall goal of these transformative changes is to achieve the newly expanded "quadruple aim" in health care: enhancing individual patient experience, improving population health, reducing costs, and, the most recent addition, improving the work life of health professionals.[6]

Competency–based learning has also been adopted in health professional education, and the terminology used to describe the competencies is consistent with that used in medical education. The Essential Competency Profile (ECP) in physiotherapy elicits exit competencies upon the completion of training of physiotherapists and physiotherapist assistants in Canada.[7] The essential competencies of practice for occupational therapists in Canada have been developed by the Association of Canadian Occupational Therapy Regulatory Organizations.[8] The Canadian Association of Genetic Counsellors has developed core competencies for training that include knowledge–based competencies and practice–based competencies.[9] The National Audiology Competency Profile lists the competencies required for training in audiology and speech–language pathology using the same framework as in medical residency education.[10] The Canadian Midwifery Regulators Council has published general and specific core competencies for midwifery education in Canada.[11] In nursing education, a competency–based conceptual framework has been well–defined and adopted for some time, including competencies

covering the domains of professional responsibility and accountability, knowledge–based practice, ethical practice, service to the public, and self–regulation.[12] Dental education is premised on a list of 47 essential competencies upon completion of training, which are defined by the National Dental Examining Board of Canada.[13] Finally, the key and enabling competencies for pharmacist training in Canada are well–defined by the National Association of Pharmacy Regulatory Authorities.[14] The competency–based approach in the training of medical and health professionals offers a unique opportunity for alignment and collaboration in interprofessional education, especially in a realistic workplace environment and early in training.

This article highlights how competency–based learning (which is a form of outcome–based learning) and workplace–based assessment (WBA) can strategically transform medical and health education.

Competency and outcome–based learning

Competency–based learning is an approach to preparing learners for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal needs.[15] It de–emphasizes pure time–based training; that is, the training duration may be lengthened or shortened, at least theoretically. It promises greater accountability, flexibility, and learner–centeredness. In medical and health education, competencies and outcomes are usually defined by external accreditation organizations and/or professional regulatory bodies.

To be successful, the implementation of competency and outcome–based learning should occur in a systematic fashion. Multiple steps are involved, including the development of guiding educational statements (vision, mission, and goals), exit outcomes (with corresponding key competencies and enabling competencies), milestones for the various learner levels, appropriate assessment tools, curriculum design, curriculum goals and unit objectives, educational activities and the related activity–specific objectives, and a curriculum evaluation strategy for continuous quality improvement. It is important to tailor the above steps to the local learning environment and context. Each step must be carefully coordinated, as failure to do so may compromise the success of competency–based learning.

Below is an example that illustrates how the abovementioned steps can be strategically implemented. Since 2015, the University of British Columbia (UBC)'s undergraduate medical education curriculum has implemented a robust renewal process to its underlying pedagogical principles. The renewed curriculum at UBC is grounded upon social responsibility and accountability, a competency–based curriculum, robust student assessment, flexibility, scholarship, integration of learning, continuity of learning, and adaptability to an evolving health care system. The graduate outcomes are set *a priori*, and the exit competencies are constructed to match the national requirements of the external qualifying examination. Competencies are grouped into year–specific milestones. The curriculum design was also changed from the traditional block system to the spiral system, whereby topics are split up and spread out longitudinally. The spiral system encourages

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both horizontal and vertical integration between topics and more closely approximates real–life thinking and encounters. For example, the teaching of biomedical ethics follows its own theme spiral. There are multiple learning activities in the first two years of the curriculum, including content in the Case Based Learning (CBL) cases, lectures, online modules, and interprofessional workshops. These learning activities are mapped to the biomedical ethics exit competencies. Additional content on ethics is also added to the final two years of the curriculum and delivered mainly in the workplace setting, to complete the spiral theme. This content is also captured in the curriculum map. Like any curriculum design, the spiral system can present challenges, such as the need for learners to jump between topics when studying. The renewed curriculum is subject to continuous improvement based on feedback from students and faculty members.

A number of enablers can help to ensure successful implementation of competency–based learning. One prerequisite is a user–friendly, real–time curriculum mapping tool. This is not a new concept, although its adaptation to a complex curriculum such as that seen in medical and health education requires a thoughtful and programmatic approach.[16] The curriculum map links granular session level objectives to the broad exit competencies. At UBC, content experts ensure that each objective, at every level, is linked to at least one objective from the levels above and below. This process identifies how the yearly milestones (or exit competencies) are achieved and related to the session level objectives.

Another important enabler of successful competency–based learning is adequate teacher support through proactive faculty development. This is especially important for provincewide distributed medical education programs, such as in British Columbia, where many teachers are clinicians and practitioners located in a vast number of geographical locations. Helpful tips for teaching in the classroom and workplace settings have recently been published by my team.[17] Examples of best practices in distributed classroom teaching include: promoting teacher–learner connectivity, optimizing the long–distance working relationship, using the reality television show model to maximize retention and captivate learners, including less teaching content if possible, telling learners what you are teaching and making it relevant, and turning on the technology tap to fill the knowledge gap. Some of the best practices in distributed teaching in a clinical workplace setting include: asking "what if" questions to maximize clinical teaching opportunities, trying the five–minute short snapper, multitasking to allow direct observation, creating dedicated time for feedback, reassuring learners that there really are no stupid questions, and working with a heterogeneous group of learners.

As we move into the future, many questions on competency–based learning remain to be answered. These concern the impact of competency–based learning on patient and population health outcomes, the cost–effectiveness of competency–based learning, and ways to empower learners to achieve excellence beyond the competency benchmarks. An education–scholarship approach in answering these questions would be helpful.

Workplace–based assessment

The traditional assessment methodology in medical and health education has limited workplace assessment, in terms of both scope and frequency. One of the implications of implementing competency and outcome–based learning is the need for a renewed student and learner assessment system, which would deploy multifaceted assessment modalities that are both continuous and frequent. Direct observation with regular feedback in a formative manner should be a critical feature, and authentic workplace–based assessment (WBA) can be used for summative decision making.

There is increasing evidence that supports a programmatic assessment approach in competency–based learning; this approach is based on the theoretical construct that any single assessment data point can be flawed, while a collection of multiple assessment points can strengthen the overall assessment decision.[18,19] In general, the higher the stakes, the more assessment points are needed. Expert group judgment should be part of the process for making any high–stakes decision. In fact, the validity of any non–standardized assessment rests more with the user than with the assessment instrument *per se*.

At UBC, the undergraduate medical curriculum has adopted the programmatic assessment approach, which is comprised of five assessment modalities: progress tests, course written examinations, portfolio, objective structured clinical examinations, and WBA. The details are well–articulated in a faculty development online modular course.[20]

Of note, WBA charts a learner's progression towards competence in tasks within clinical placements over time. To obtain a passing grade at the end of the year, students need to demonstrate that they have achieved the educational milestones related to the learning outcomes commensurate to the level of training, which are in turn predetermined by the program. There are two streams of information–gathering to inform WBA: direct observations at the workplace and contributory data (which reflect the students' applied knowledge, skills, and attitudes, from multiple sources). Support for the students who demonstrate academic difficulty and opportunity for remediation are provided throughout the year.

Some of the early lessons learned from the rollout of WBA include the need for continuous improvement of the system, active student engagement and feedback, and ongoing communication with the key stakeholders, including frontline teachers, administrative staff, and educational leaders. Change–management plays a critical role here.

As with implementing competency–based learning, further studies are warranted to examine the impact of WBA on the student experience, resource requirement, and staff workload. It would also be interesting to explore how WBA can continue upon completion of training, such as for the purpose of continuing professional development.

Implications

This article highlights the future of competency–based learning and workplace–based assessment in transforming medical and health education. These approaches provide consistency across the learning continuum, from the undergraduate to postgraduate and to professional development levels. The approaches also allow valid and reliable measurements to be made for quality improvement purposes. A number of competencies are common and can be shared among all health professions, providing new opportunities for alignment and collaboration in interprofessional education.

There is an increasing interest to adopt competency–based learning and WBA in other university degree–granting programs. Lessons learned from medical and health education can be tremendously informative and helpful. The future is here and now.

Acknowledgement

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