

The Challenges of Developing Online Learning



Musculoskeletal (MSK) conditions are common in health-care practices and have been identified as the leading cause of chronic health problems, longterm disability, and consultations with health professionals in Canada¹⁻³. In 1998, it was estimated that MSK issues accounted for about 20% of the daily care administered by family practitioners⁴. It is also known that signs and symptoms of MSK conditions may be underdiagnosed by primary care physicians, and the examination of this system is often omitted from routine patient assessments^{5,6}. Some primary care physicians may not feel they can alter the clinical course by early detection, for example in the case of osteoarthritis. Studies of medical students and practicing physicians have cited a lack of interest and/or a lack of perceived importance of the MSK system, time constraints, and an overall lack of confidence in providing assessment as reasons for discomfort with managing patient MSK conditions^{5,7-11}.

The average number of hours devoted to teaching MSK clinical skills at Canadian medical schools is limited compared to the prevalence of MSK complaints in the population. Canadian schools' preclerkship MSK clinical skills teaching is heavily dependent on the contributions of non-MSK specialists¹². Pinney and Regan concluded that there is a marked discrepancy between the MSK knowledge and skill requirements of a primary care physician and time devoted to MSK education in Canadian medical schools¹³.

The report by Averno, *et al* in this issue of *The Journal* demonstrates the usefulness and effectiveness of using an online module for teaching the examination of the hand by medical students. Three groups of students were exposed to a Web-based module, tutorial-based learning, or independent study of a standard textbook, respectively¹⁴. Test results revealed that the students using the module had significantly higher scores than the students using either of the other study methods. These results are encouraging in that many online evaluations generally report equivalent results between face-to-face learning and Web-based learning.

It is important to identify who the learners are and how

they learn. The educational literature generally considers 4 age groups: Matures (born prior to 1946), Baby Boomers (1946–1964), Generation X (1965–1980), and Millennials (1981–1994) or Net-Generation¹⁵.

Our current crop of learners, the Millennials, is a more diverse group than ever before. They are more technologically advanced than their faculty, with 84% reporting owning a computer before entering post-secondary institutions, and 90% accessing the Internet daily¹⁶. Millennials exhibit different learning styles. They are more comfortable with experiential activities, and tend toward teamwork, structure, and the use of technology¹⁷.

Many faculty and universities are experimenting with courses using both face-to-face and online instruction. This blended learning approach has its roots in the corporate world and is rapidly gaining ground at academic institutions.

At McMaster University, in Hamilton, Canada, the entire medical undergraduate curriculum is available online. This is supplemented by large-group lectures, which are available online for asynchronous learning and review. Teaching and learning clinical skills presents challenges for faculty and students as the program has grown from 100 to 180 students over only a few years, with no increase in human resources. Innovative approaches are required to deliver content with limited faculty resources. Teaching clinical skills is labor-intensive, delivered in a small-group format, and can be of variable quality and consistency¹⁸.

In their metaanalysis, Cook, *et al*¹⁹ summarized the effect of Internet-based instruction for health professional learners compared with no intervention and with non-Internet interventions. The study revealed that Internet-based learning is associated with large positive effects compared with no intervention; however, overall, compared with non-Internet instructional methods, the effect was small, suggesting effectiveness similar to traditional methods¹⁹.

In a case study of student satisfaction, blended learning

See Evaluation of Web-based teaching module on examination of the hand, page 623

was shown by So²⁰ to be an effective method. Key elements of a successful program were integration of technology components and instructional design strategies. So explains further: "To be more learner-centered, the learning environment needs to be designed to allow individual learning, as well as to create opportunities for interaction with other classmates and the instructors. For effective online communication, it is important to provide channels for both synchronous (e.g., face-to-face meetings) and asynchronous (e.g., online discussion forums) interactions. Finally, the online learning environment should include a place where students can receive socioemotional support to reduce their feeling of frustration, isolation, and dissatisfaction, as well as to provide content-related support for cognitive learning."²⁰

No educational resource will achieve its full potential when used exclusively. Sharing online assets in a repository such as the Health Education Assets Library (HEAL) is the way to go. With a mission to provide free digital resources of the highest quality that meet the needs of today's health sciences educators and learners, HEAL promotes the preservation and exchange of useful educational assets while respecting ownership and privacy²¹.

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