Online Videos: A New Tool for Medical Education

Joseph Anthony Andrews, BHSc^a

^aMD Class of 2014, Faculty of Medicine, University of Alberta

ABSTRACT

Currently, most Canadian medical schools educate students on core biomedical knowledge through lecture-based courses. However, recent studies indicate that passive lecture-based university courses fail to educate students in an efficient manner. In response, Dr. Sebastian Thrun and Sal Khan separately developed successful online educational models that engage students with interactive online videos focusing on fundamental concepts. This use of online interactive videos represents a new educational tool medical schools can use to engage students in active learning and also as a way to provide standardized teaching to students dispersed across several hospitals or at different campuses.

KEYWORDS: vodcasting, online education, lectures, video, medical education

A NEW EDUCATIONAL TOOL

In autumn of 2011, computer science professor Dr. Sebastian Thrun created an online version of “Introduction to Artificial Intelligence” that ran parallel to his course at Stanford University. However, he made this online course available to anyone outside the university. Two unexpected outcomes occurred. First, within weeks of offering the course 58,000 students enrolled, and in the end, over 160,000 non-Stanford students from across the globe completed the course. The second, and most unsettling outcome for Stanford, was that of students from across the globe completed the course.

Dr. Thrun’s online artificial intelligence course was a success in part because it was interactive. All of the videos involved him explaining concepts on a piece of paper with frequent pauses for multiple choice questions or requests for the student to correctly label part of a diagram. This teaching
method forces students to think actively and the questions allow students to identify their level of understanding of a lesson through immediate feedback. In contrast, university lectures provide a passive lecture style where the only feedback many students receive is from a midterm or final exam. Dr. Thrun’s modality of teaching is an attractive benchmark for future teaching because it de-emphasizes the “weeder” method, where students are given substantial amounts of difficult material and either sink or swim, for a method placing emphasis on solidifying one concept before moving onto the next.

Another leader in online education is Sal Khan, a Massachusetts Institute of Technology trained electrical and computer engineer, who began in 2004 to teach his cousins simple math by creating short online videos.5 Khan’s teaching method revolves around simplicity; just him talking with an electronic blackboard onscreen to illustrate concepts visually. In 2009, his videos garnered millions of views on YouTube, so Khan quit his job as a hedge fund analyst and formed a non-profit online educational website.7 By the summer of 2012 Khan’s website had over 3,200 videos with more than 155 million views. In part, Khan’s videos are an educational success because they allow students to learn at their own pace. However, the most important attribute of Khan’s videos is their simplicity. As pointed out by Harden, a problem with current university lectures, and therefore recording of these lectures, is that PowerPoint has become a crux for ineffective teaching—with professors overfilling slides with detailed information that obscure the fundamental concepts.6 In contrast, Khan discards PowerPoint in favour of a simpler modality, an electronic blackboard. With this blackboard he breaks complex topics, such as linear algebra, into brief videos that focus on explaining core concepts.

Although extreme cases, Dr. Thrun’s and Mr. Khan’s online videos mirror an emerging trend in Canadian medical education—the use of videocasting. Videocasting is a method where a recording captures the PowerPoint slides along with the lecturer’s voice and combines them into a video posted online for student viewing. Educational institutions are embracing videocasting as a method to enable students to review conceptually difficult material after class and for absent students to learn the missed material.7 However, as noted earlier, the leaders of web-based education are supplanting passive lecture recordings by creating dedicated online videos with built in interactive features.

Online video lectures represent a paradigm shift in the way of presenting educational material. The current university model, one in which a professor lectures to a substantial group of students, represented the best way of disseminating information in the past because it brought one expert and numerous students from different parts of the city, country, or globe together for a one-way exchange of information. However, as a class size increases, the knowledge acquired by students decreases in part because students are intimidated by large audiences and are less likely to ask a professor for clarification when a topic is troublesome.8 Thus, questions remain unasked and concepts go unlearned. However, as Ruiz et al. indicate, students prefer online videos because they can select a learning pace agreeable to their learning style.9 For instance, if a demanding concept arises, the student can rewind to review or pause to clarify with online resources or textbooks. Students also prefer the advantage of being able to review the material by re-watching the video at a later date.10 Most importantly, though, the use of online educational tools by students correlates with higher examination scores as well as better long-term retention of knowledge.9,11,12

ONLINE EDUCATIONAL TOOLS AND MEDICAL EDUCATION

With regards to medical education, online videos represent a unique opportunity to overcome challenges many medical schools face. For instance, with the increasing demands of clinical work it is difficult to recruit and retain clinicians for lectures. A web-based method for lectures would allow these clinicians to record lectures at a convenient time and post them online for students. Another problem medical schools face is the need to provide standardized learning for medical students dispersed over several hospital sites or even different campuses. Online teaching modules allow dissemination of one lecture to many students in differing geographical locations. However, despite the benefits of online interactive videos, two important hurdles exist when trying to utilize them in a medical education program. First, implementing a web-based learning environment is an expensive endeavour requiring a skilled information technology staff. The final obstacle is that the educational institution must realize the content provided by the interactive video is paramount to the sophistication of the technology behind the video. Thus every effort must be made when creating the video to ensure that medical learning objectives are being taught and that a competent teacher provides the information.

In the end, learning to become a physician involves a combination of small group learning, problem-based learning, clinical experience, patient interaction experience, and lecture-based courses. Online educational videos should not displace any of these components, but instead could represent an effective learning tool for use in the blended medical education curriculum offered by most medical schools.9

REFERENCES