#Nomoretextbooks? The impact of rapid communications technologies on medical education

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Accepted for publication Dec. 4, 2013

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DOI: 10.1503/cjs.030913

SUMMARY

This paper was selected as the 2013 student essay winner by the Canadian Undergraduate Surgical Education Committee. The essay was in response to the question "How does rapid communications technology affect learning?".

Tomorrow, I start my vascular surgery rotation. Before bed tonight, I will watch a YouTube video of a femoral-popliteal bypass surgery, review the surgical anatomy from Zollinger's *Atlas of Surgical Operations* on my iPad while waiting for my car tires to be changed, listen to a podcast on peripheral vascular disease while riding my exercise bike and perhaps tweet about my new rotation. My day is typical of a medical student in the context of increasing use of rapid communications technology: 91% of health professions students between the ages of 18 and 25 use Facebook.[1] Rapid communications technology is defined broadly in this essay as any technology that enables access to information through an electronic device and/or permits that information to be shared in a public, social way. This includes mobile phones, laptops, tablets, online textbooks and social media. In this essay, I'll discuss the impact of these technologies on medical education.

Rapid communications technology has made access to information instantaneous and ubiquitous. Students no longer need to wait until they have access to their textbooks or handbooks to recall information — they can pull out their mobile phones and look it up instantly. There are a number of medical apps that allow users to look up drug dosing and approaches to common conditions and recall surgical anatomy.[2] The ubiquity of access to information helps students to maximize their time and learning opportunities. In addition, this rapid access to information can help to reinforce learning in a contextual manner.[3] Ho and colleagues[4] found that having a personal digital assistant case log versus a paper case log enhanced student learning and reflection.

Beyond access to information, rapid communications technology potentially offers exciting new ways of learning. For example, users of anatomy.tv are able to view 3-dimensional (3D) reconstructions of anatomy as opposed to the 2-dimensional images available in print textbooks. In addition, users can toggle between an abdominal computed tomography scan and the virtual 3D anatomy representation and correlate the two.[5] Medical students now also regularly use podcasts and vodcasts to supplement their learning in novel ways, all while driving to clinic or exercising.[6]

Social media provides a means for learners to engage with their teachers and each other. Twitter, for example, could be used to involve students by creating a dialogue on the subject matter by retweeting key points and messages from lecture material.[7] Through Twitter, students can continue a discussion long after the lecture is over and tie information to current events by using hashtags.[7] Social media platforms provide a powerful way to integrate

medical education in a global setting. *The New England Journal of Medicine* Facebook group, for example, has more than 500 000 "likes" from users around the world. Each week a new "Image Challenge" is posted, and Facebook users can comment and give their diagnosis.[8] A recent systematic review found that social media can improve collaborative learning and engagement.[9]

However, many authors have pointed out the challenges these new technologies present to medical education.[2,10] As long as mobile phones are on, students are bombarded by text messages, emails and phone calls, constantly interrupting the day.[2] There is the potential for "distracted doctoring" — mobile technology interfering with the focus on the patient.[9] These technologies also have the potential to make students more superficial learners without a deeper grasp of the material.[2] Instead of reading the whole chapter on a topic, learners look up bits and pieces and end up with chunks of knowledge that aren't integrated. In addition, the overwhelming amount of online information can be difficult for students to sift through and decipher.[6] Concerns over patient confidentiality and student professionalism have spurred professional associations, such as the Canadian Medical Association and Canadian Federation of Medical Students, to release guidelines regarding social media.[11,12] Other challenges include blurring of professional/personal boundaries, cost and technical issues.[3]

It is difficult to assess the impact of rapid communications technology on medical education, largely because it is such a rapidly changing and diverse area.[13] The technology continues to change and progress — what was once "hip" is now passé. The challenge for educators is to keep up with the speed of innovation while limiting the problematic impacts of these new technologies.[3] From a personal perspective, it is important that medical educators remember the limitations of technology. Medical students need to learn an approach to chest pain, the branches of the aorta and the dosing of morphine; rapid communications technologies provide new ways of learning that information. But beyond simply absorbing medical knowledge, medical students also need to become insightful history-takers, keen observers and compassionate physicians who can comfort real human beings.[14] Excellent role models and genuine patient interaction are the cornerstones of medical education. Henry David Thoreau said, "Men have become the tools of their tools."[15] At the start of my new rotation and, ultimately, my new career, I hope that we can use these rapid communications tools to better our medical education and to become more compassionate, more empathetic and more insightful physicians of the future.

Competing interests: None declared.

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