Information Technology Literacy: The Fourth R

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The traditional foundation of most basic skills-oriented educational programs consists of Reading, wRiting and aRithmetic. However, information technology appears to be vying as an additional leg to this three-legged stool. Those of us who teach professional school are already keenly aware of the new and overwhelming digital resources that are available to ourselves and our students.

The Millennials who now grace our classes have been described by Marc Prensky as "Digital Natives," individuals who have "spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age."[1] It is mind-boggling to consider that today's college students spend 9.5 hours per day interacting with technology like MP3 players, gaming devices and computers. That doesn't include the 2.5 hours of daily TV.[2] Prensky estimates that today's average college grads have spent less than 5,000 hours of their lives reading and nearly 20,000 hours watching television.[1]

One might instantly assume that because students use all this technology in their personal lives, they would prefer its use in their classrooms as well. Ironically, many of the technology studies have shown that high levels of use and skill do not necessarily translate into preferences for more use of technology in the lecture hall.[3,4] Perhaps you've experienced students who still want that paper handout from you in addition to the electronic version. Even faculty who provide only electronic documents via a Learning Management System are often surprised when students print off these documents and bring the paper to class. Students often prefer to have paper in hand for note-taking.

Although a wide variety of tablet-type devices have entered the market, they still have limitations in the classroom. There is something about writing little notes in the margins and highlighting in a dozen colors that appeals to students. Although there is tablet and stylus technology available to duplicate a similar experience, students have been slow to adopt these. Nonetheless, we are starting to see more of these devices in our classes. Electronic versions of documents allow one to cut-and-paste and to directly hypertext to other documents, videos and other educational resources.

One thing is clear, out of all the things changing in optometric education, technology is leading the pack. Quite literally, each new day brings innovativetools to our faculty and students. E-mail, which was the quintessential student communication tool for students, has been replaced quickly with text messaging. A survey of more than 2,000 students at the University of Melbourne showed that 80% of students text daily with their cell phone.[5] However, the same 2008 report also goes on to say that 67.8% of students have not used their mobile phone to access Web-based information and services. What a difference three years makes in the world of technology! In 2011, who among us has not seen the vast majority of our students attached to the Internet via their smartphones? (Now that we mention it, who among us has not seen the vast majority of our faculty attached to their smartphones?)

What Students Really Need to Know

Despite all of this new technology and explosion of information in our palms, we usually do not spend an adequate amount of time showing students how to find information. The days of "knowing everything" are long gone, and we should be replacing the memorization of facts with an efficient ability to lookup those facts. Clearly, some things in optometry are so fundamental that they need to be committed to memory. However, for many others, it would be best to teach our students where to retrieve the required information and how to evaluate its relevance to evidenced-based optometric practice.

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Google and Wikipedia can be amazing tools, but students have trouble realizing that the information retrieved is not always correct. Lemley and Burnham, in their paper "Web 2.0 Tools in Medical and Nursing School Curricula,"note that the most common digital tools used in the curricula of medical and nursing schools include blogs, wikis, videocasts and podcasts.[6] These may not be the best tools to use to find accurate, up to date and scientifically sound information on various medical topics and research.

Online resources that might be better suited for students' needs include:

1. The Directory of Open Access Journals(http://www.doaj.org/doaj?func=subject&cpid=40&uiLanguage=en). Here you can find several outstanding journals, such as:

   - BMC Ophthalmology
   - Clinical Ophthalmology
   - Clinical Optometry
   - Digital Journal of Ophthalmology
   - Eye and Brain
   - Journal of Optometry
   - Journal of Vision
   - Optometric Education
   - Optometry & Vision Development
   - Journal of Behavioral Optometry

2. Medscape (http://www.medscape.com/ophthalmology)

3. Digital Atlas of Ophthalmology (http://www.nyee.edu/page_deliv.html?page_no=50)

4. The Neuro-Ophthalmology Virtual Education Library (http://novel.utah.edu/)

5. SECO International (http://www.secointernational.com/eposters/index.cfm).

Students and faculty alike should also consult past ASCOTech columns and this journal for the latest information on technology and optometric education.[7,8]

It is generally accepted that practicing optometrists underutilize the eyecare literature. To some extent this is likely due to our lack of teaching this skill in optometry school. After all, why search on my own for the information if Dr. Smith will tell me what I need to know, right? However, instilling those lifelong learning skills should be an important component to any health profession's program. It is said that it may take as long as one or two decades for original research to be used in routine clinical primary care practice.[9] With the advent of the resources noted above, this should no longer be true if we teach our students how to access and use these digital resources now.

Barnard et al. explain that information literacy translates into lifelong learning that can be initiated, extended and sustained through abilities that use technologies but are independent of them.[10] They posit that the development of information literacy facilitates engagement with effective decision-making, problem-solving and research. Although undergraduate students appear to develop a sound background of information literacy skills, professional school educators may be lagging behind in using these skills to develop critical thinking skills.[10]

Rising to the Challenge

Technology will continue to challenge the best of faculty members. Whether it is Electronic Health Records in our clinics, the newest XYZ retinal scanner in our clinical diagnostic battery, optometric vision therapy treatment tool or new Learning Management System software, there is always something new to learn. We should embrace each of these advancements as an opportunity to teach our students in new and different ways. By fully engaging in all of today's tools, we can instill information technology literacy that will prepare our students for a solid future of optometric practice. Our expectations for students should be lifetime learning, not just as a great catch phrase, but as a reality put into practice every day.

References:

1. Prensky M. Digital natives, digital immigrants. On the Horizon 2001;9:1-6.

2. Marketing Charts [Internet]. Thetford Center, VT: Watershed Publishing; c2007-2011. College students spend 12 hours/day with media, gadgets; 2009 Nov 30 [cited 2011 Feb 24]. Available from http://www.marketingcharts.com/television/college-students-spend-12-hoursday-with-media-gadgets-11195/.

3. Caruso JB, Kvavik RB. ECAR study of students and information technology 2005: convenience, connection, control, and learning. EDUCAUSE; 2005.

4. Kvavik RB. Convenience, communications, and control: how students use technology. In: Oblinger D, Oblinger J, eds. EDUCAUSE; 2005:7.1-7.20.

5. Kennedy GE, Judd TS, Churchward A, Gray K. First year students' experiences with technology: are they really digital natives? Australasian J of Educ Tech. 2008;24:108-22.

6. Lemley T, Burnham JF. Web 2.0 tools in medical and nursing school curricula. J Med Libr Assoc. 2009;97:50-2.

7. Goodfellow GW, Maino DM. ASCOTech: Technology can help students with learning disabilities succeed. Optometric Education.2010 Fall;36:16-8.

8. Maino DM, Goodfellow GW. ASCOTech: Optometry: there's an app for that. Optometric Education. 2011 Winter-Spring;36(2):60-2.

9. Translating research into practice (TRIP) - II. 01-P017, 1-6. 2001. Rockville, MD, Agency for Healthcare Research and Quality. 6-6-2011. Ref Type: Report.

10. Barnard A, Nash R, O'Brien M. Information literacy: developing life long skills through nursing education. J Nursing Educ. 2005;44:505-10.