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Pros and cons of digital textbooks

Students test just as well after reading e-books, but screens often strain the eyes

By Leslie Mann, Special to the Tribune

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College students who study with digital textbooks perform just as well on tests as do their peers who use print textbooks, but the digital books pose some problems, according to a recent study at Indiana State University.

As print textbooks go the way of penmanship and the card catalog, colleges and universities are looking at the pros and cons of using digital textbooks, said Jim Johnson, the study's lead researcher and the director of instructional and information technology services at the Terre Haute-based university.

About half of the 233 participants used print textbooks, while the others used iPad 2 hand-held computers. Most of the students were ages 20 to 22. Gender did not affect results; men and women performed equally well.

"The biggest 'pro' of digital texts is convenience, whether it's using a laptop, notebook or phone," Johnson said, describing the results of his study and subsequent focus groups with the participants.

Navigating the material was easy for the participants, even though most said they did not own iPad 2s and they were given material they had not studied in their elementary-education course work, said Johnson.

"Another 'pro' is professors like digital texts because they can provide more current material than print textbooks, which can take a year or two to get to print," said Johnson.

Computer vision syndrome

The biggest drawbacks of digital texts cited by the participants were eye strain, cost and potential technological problems.

Some of the students cited eye strain even though the pretest reading only took a half-hour for most of them. Studying for a test could require much more time, said Johnson.

"This was an unexpected outcome because the iPad 2s have high resolution," Johnson said of the eye problems. "One student was even nauseous."

The medical term is "computer vision syndrome," said Dr. Dennis Siemsen, assistant professor of ophthalmology at Mayo Clinic in Rochester, Minn. "It applies with any type of electronic device."

The problem is threefold, Siemsen said.

"One is accommodation," he said. "Your eyes strain to accommodate the smaller print, which is usually smaller in electronic text. Second, many devices are back-lit so you're staring at a bright screen. It's like looking at the bright sun all day. Third, we tend to have our eyes wide open when looking at a screen, as opposed to partially open when we hold a book. This can lead to dry eye."

The students also worry about cost of digital textbooks, the study said.

"The digital text can cost more than a print textbook and the student can't resell it after he's used it," said Johnson. "Also, the students can't all afford the best devices. Most of the participants said they have laptops and phones but would like to have iPads or e-readers."

Although this did not occur in the study, Johnson said, students said they also worry about not being able to access digital texts because of mechanical problems such as low battery life.

Despite growing up in the computer age, some of the participants they "just prefer to hold a book in their hands and turn the pages" rather than use digital devices, Johnson said.

"Personally, I just prefer print because I can make notes on it and because it's less eye strain," said Brienne Vandenberg, of New Lenox, who will be a senior in college this fall at Miami University in Ohio. "After reading (digital texts) for a while, I get a headache or the glare bothers me. So I wind up spending a lot of money on ink to print out what I can."

So far, her assigned texts and tests have been a combination of print and digital, Vandenberg said.

"For tests, you usually have a choice, but in one class all the quizzes were digital," she said. "I struggled with that."

Vandenberg uses a combination of devices — cellphone, laptop and iPad — to access her texts. Johnson said that's typical of today's college students.

Long-term impact?

The experts agree the subject deserves more investigation.

"Before we go whole-hog on electronic textbooks, we need to know more about the effects on our eyes," Siemsen said. "Young people who are in college now may not even realize how the electronic texts are affecting them. They may say they fall asleep while reading or they can't keep up with their work, but this can mean eye strain. While digital texts are fabulous on the surface and a big help for people with vision problems, we need to look long-term."

"Do smaller screens make it worse?" Johnson asked. "Does the type of device matter? Would it help if we only used devices that let us move around, instead of sitting still at a desk? Test performance may be equal with digital and print texts, but the digital ones can create other problems."

You can minimize computer vision syndrome, according to the American Academy of Ophthalmology's website, by blinking more often. Normally, we blink 18 times a minute, according to the website. But while using a computer, we blink half as many times. To remind you to blink, you can buy devices, including one called blinknow.

Position your screen below eye level so your eyes are not wide open, the website suggests. Use the "20-20-20 rule" — look at least 20 feet away from the screen every 20 minutes, for at least 20 seconds. Use artificial tears. Get enough sleep. If you wear contacts, don your glasses for "contact breaks."

"Time will tell for my generation," Vandenberg said. "I'm not sure yet how (the digital trend) will affect us long-term."

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