Learning curve goes digital

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Oklahoma State University professor Bill Handy has big plans for the Apple iPad this fall. If the text messages he has received since the school announced he would test the tablet-style e-reader in some courses are any indication, students are eager to get their hands on the devices, too.

Handy, who teaches in the School of Media and Strategic Communications, is quick to stress that his intent is not to celebrate the new technology so much as to evaluate its effectiveness in the classroom.

"This is not research to prove that the iPad is great," he says. "There's a lot riding on what direction the university might take. If it's not beneficial, (I'll be) glad we figured that out early in the game."

Compared with traditional textbooks, the iPad and other devices for reading digital books have the potential to save on textbook costs in the long term, to provide students with more and better information faster, and -- no small matter -- to lighten the typical college student's backpack.

Yet the track record on campus so far for e-readers has been bumpy. Early trials of the Kindle DX, for example, drew complaints from students about clunky highlighting of text and slow refresh rates. Princeton and George Washington universities this spring found the iPad caused network problems. Federal officials in June cautioned colleges to hold off on using e-readers in the classroom unless the technology can accommodate disabled students.

Though many of those problems are being or have been addressed, some of the most tech-savvy students aren't quite ready to endorse the devices for academic use. And some educational psychologists suggest the dizzying array of options and choices offered by the ever-evolving technology may be making it harder to learn rather than easier.

"The challenge for working in the electronic age is that we have so much access to information but we still have the same brain we always had," says Richard Mayer, psychology professor at the University of California-Santa Barbara. He focuses on how multimedia can enhance learning. "The problem is not access to information. It is integrating that information and making sense out of it."

There's a lot to like about digital learning. Santa Clara University student Christopher Paschal, 19, for example, appreciated the search function in his economics e-textbook, and said the included video clips offered "an alternative method of learning," and eliminated "the monotony of endless pages of reading."

But ultimately, "I feel that I comprehend material better in regular textbooks," Paschal says. Why? For starters, it's more difficult to look at a computer screen when you're tired, he says, and harder to concentrate when Facebook, YouTube and e-mail are just a click away.

Also, he and others say, it may simply be that the technology is still unfamiliar. Whereas e-readers have taken off in the leisure-reading market, publishers have been slower to jump into the education market. Reasons vary, but one challenge for publishers is that reading for the purpose of gaining knowledge is a more complex process than reading for pleasure.

"Usually in a novel you're going through it from start to finish. In a textbook you're constantly flipping back and forth. You're all over the

book a lot more often," says Matt Lilek, 22, a part-time computer science major at Joliet Junior College in Illinois. "Textbook publishers haven't had a chance to tailor things for the iPad. If publishers really get behind the iPad, I can see a day where it's the only thing I would bring to school."

Even then, some evidence suggests students see a downside to 24/7 interactivity when it comes to preparing for exams or doing homework. During visits last fall to libraries, coffee shops and other campus hangouts to analyze how students study, a test-prep company noted that, when it was time to study, cell phones, laptops and Kindles were put away.

"In today's ADD society, textbooks are pleasantly single-dimensional and finite," says Jeff Olson, vice president of research for Kaplan Test Prep and Admissions, whose team conducted observational studies. "When I asked study participants why they didn't use their laptops to look something up, I heard some version of 'because that's my distraction.' "

A host of research over the past decade has shown that even the option to click hyperlinks to related material can create confusion and weaken understanding. One study found reading comprehension declined as the number of clickable links increased. A 2005 review by researchers at Carleton University in Ottawa, Canada, of 38 studies found "very little support" for the idea that all those links to additional information enrich the reader's experience. A 2007 study published in Media Psychology raised similar concerns about add-ons such as sound and animation.

The online environment "promotes cursory reading, hurried and distracted thinking, and superficial learning," argues Nicholas Carr, who raises concerns about the long-term implications in "The Shallows: What the Internet Is Doing to Our Brain," which was published in June. "The danger is you don't encourage people to think critically and, ultimately,

you don't encourage them to think creatively."

Some of the newer devices try to mimic traditional study behavior with features such as the ability to highlight text and take notes in the margins. Still, the gee-whiz technology doesn't necessarily help students study better, suggests a study published in August in the Journal of Educational Psychology. Students often highlight too much material, so building a highlighting function into the technology may simply enable students to continue an ineffective habit, the study found. "Worse, they may not even process or understand what they select," says study author Ken Kiewra, a professor at the University of Nebraska-Lincoln.

Despite reservations, expectations remain high for e-reader technology on campuses. Seton Hill University in Greensburg, Pa., and George Fox University in Oregon plan to give or phase in iPads for most students starting this fall. At a ceremony in early August, each member of the University of California-Irvine School of Medicine's incoming class of 2014 received not only the traditional white coat, but also a shiny new iPad, pre-loaded with everything necessary for the first year of course work.

Scores of others, including Reed College and North Carolina State University, plan to offer opportunities for students to test-drive iPads. And two-thirds of campus technology chiefs predicted last fall that e-books will become an "important platform for instructional resources" within five years, according to the Campus Computing Project.

Publishers, meanwhile, have big ideas for personalizing student learning. "That's the great promise," says Don Kilburn, president of Pearson Learning Solutions, a publisher of education materials.

More glitches are perhaps inevitable. But the technological advances "represent very real potential to remake education for the better," says

Kaplan Test Prep and Admissions' Jeff Olson. "The potential for the textbook to come alive with interactivity ... will make the next several years of e-book innovation fascinating to watch."