Hand out In a Digital Future, Textbooks Are History

Heidi Schumann for The New York Times

In California, high school interns try out digital "flex books" created by the CK-12 Foundation.
By TAMAR LEWIN

At Empire High School in Vail, Ariz., students use computers provided by the school to get their lessons, do their homework and hear podcasts of their teachers' science lectures.

Down the road, at Cienega High School, students who own laptops can register for "digital sections" of several English, history and science classes. And throughout the district, a Beyond Textbooks initiative encourages teachers to create — and share — lessons that incorporate their own PowerPoint presentations, along with videos and research materials they find by sifting through reliable Internet sites.

Textbooks have not gone the way of the scroll yet, but many educators say that it will not be long before they are replaced by digital versions — or supplanted altogether by lessons assembled from the wealth of free courseware, educational games, videos and projects on the Web.

"Kids are wired differently these days," said Sheryl R. Abshire, chief technology officer for the Calcasieu Parish school system in Lake Charles, La. "They're digitally nimble. They multitask, transpose and extrapolate. And they think of knowledge as infinite.

"They don't engage with textbooks that are finite, linear and rote," Dr. Abshire continued. "Teachers need digital resources to find those documents, those blogs, those wikis that get them beyond the plain vanilla curriculum in the textbooks."

In California, Gov. Arnold Schwarzenegger this summer announced an initiative that would replace some high school science and math texts with free, "open source" digital versions.

With California in dire straits, the governor hopes free textbooks could save hundreds of millions of dollars a year.

And given that students already get so much information from the Internet, iPods and Twitter feeds, he said, digital texts could save them from lugging around “antiquated, heavy, expensive textbooks.”

The initiative, the first such statewide effort, has attracted widespread attention, since California, together with Texas, dominates the nation’s textbook market.

Many superintendents are enthusiastic.

“In five years, I think the majority of students will be using digital textbooks,” said William M. Habermehl, superintendent of the 500,000-student Orange County schools. “They can be better than traditional textbooks.”

Schools that do not make the switch, Mr. Habermehl said, could lose their constituency.

“We’re still in a brick-and-mortar, 30-students-to-1-teacher paradigm,” Mr. Habermehl said, “but we need to get out of that framework to having 200 or 300 kids taking courses online, at night, 24/7, whenever they want.”

“I don’t believe that charters and vouchers are the threat to schools in Orange County,” he said. “What’s a threat is the digital world — that someone’s going to put together brilliant $200 courses in French, in geometry by the best teachers in the world.”

But the digital future is not quite on the horizon in most classrooms. For one thing, there is still a large digital divide. Not every student has access to a computer, a Kindle electronic reader device or a smartphone, and few districts are wealthy enough to provide them. So digital textbooks could widen the gap between rich and poor.

“A large portion of our kids don’t have computers at home, and it would be way too costly to print out the digital textbooks,” said Tim Ward, assistant superintendent for instruction in California’s 24,000-student Chaffey Joint Union High School District, where almost half the students are from low-income families.

Many educators expect that digital textbooks and online courses will start small, perhaps for those who want to study a subject they cannot fit into their school schedule or for those who need a few more credits to graduate.

Although California education authorities are reviewing 20 open-source high school math and science texts to make sure they meet California’s exacting academic standards in time for use this fall — and will announce this week which ones meet state standards — quick adoption is unlikely.

“I want our teachers to have the best materials available, and with digital textbooks, we could see the best lessons taught by the most dynamic teachers,” said John A. Roach, superintendent of the Carlsbad, Calif., schools. “But they’re not going to replace paper texts right away.”

Whenever it comes, the online onslaught — and the competition from open-source materials — poses a real threat to traditional textbook publishers.

Pearson, the nation’s largest one, submitted four texts in California, all of them already available online, as free supplements to their texts.

“We believe that the world is going digital, but the jury’s still out on how this will evolve,” said Wendy Spiegel, a Pearson spokeswoman. “We’re agnostic, so we’ll provide digital, we’ll provide print, and we’ll see what our customers want.”

Most of the digital texts submitted for review in California came from a nonprofit group, CK-12 Foundation, that develops free “flexbooks” that can be customized to meet state standards, and added to by teachers. Its physics flexbook, a Web-based, open-content compilation, was introduced in Virginia in March.

“The good part of our flexbooks is that they can be anything you want,” said Neeru Khosla, a founder of the group. “You can use them online, you can download them onto a disk, you can print them, you can customize them, you can embed video. When people get over the mind-set issue, they’ll see that there’s no reason to pay $100 a pop for a textbook, when you can have the content you want free.”

The move to open-source materials is well under way in higher education — and may be accelerated by President Obama’s proposal to invest in creating free online courses as part of his push to improve community colleges.

Around the world, hundreds of universities, including M.I.T. and King Fahd University of Petroleum and Minerals in Saudi Arabia, now use and share open-source courses. Connexions, a Rice University nonprofit organization devoted to open-source learning, submitted an algebra text to California.

But given the economy, many educators and technology experts agree that the K-12 digital revolution may be further off.

“There’s a lot of stalled purchasing and decision making right now,” said Mark Schneiderman, director of federal education policy at the Software & Information Industry Association. “But it’s going to happen.”

For all the attention to the California initiative, digital textbooks are only the start of the revolution in educational technology.

“We should be bracing ourselves for way more interactive, way more engaging videos, activities and games,” said Marina Leight of the Center for Digital Education, which promotes digital education through surveys, publications and meetings.

Vail’s Beyond Textbooks effort has moved in that direction. In an Empire High School history class on elections, for example, students created their own political parties, campaign Web sites and videos.

“Students learn the same concepts, but in a different way,” said Matt Donaldson, Empire’s principal.

“We’ve mapped out our state standards,” Mr. Donaldson said, “and our teachers have identified whatever resources they feel best covers them, whether it’s a project they created themselves or an interesting site on the Internet. What they don’t do, generally, is take chapters from textbooks.”