



Realizing the Promise of **Digital Textbooks**

Interactive textbooks are poised to transform teaching and learning—once schools put the right policies and IT infrastructure in place

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Executive Summary

The movement to digitize classroom content has the potential to change education in unprecedented ways. The emergence of low-cost, easy-to-use computing devices offers schools new ways to customize learning, so students no longer are subject to a static, one-size-fits-all curriculum. The early results of this shift from print to digital content appear to be quite promising: In some cases, student performance has improved by double digits.

However, schools must clear a number of barriers in order to reach this Promised Land. They must strike deals with publishers that make economic sense for both parties. Then they must navigate the maze of various file formats and compatibility issues that can arise from using digital content in the classroom. Just as important, schools require the necessary tools to monitor the use of student devices, remove inappropriate content and track down lost or stolen devices. Once these barriers are overcome, the possibilities for education are virtually limitless.

The Future of our Classrooms

The classroom of tomorrow will be very different from the one often seen today. Gone will be students sitting at desks, opening textbooks, and listening to the teacher lecture. Instead, lessons will be delivered via mobile devices (tablets, eReaders, laptops, or even smart phones). Content will be digital, and a variety of supplemental aids (video, online assessments, search tools, and context-sensitive hyperlinks) will enhance the learning process. Teachers no longer will be information gatekeepers; instead, they'll become guides to self-directed learning, helping pupils navigate their way through a wide array of digital tools.



However, schools must clear several barriers first. School leaders must choose which device makes the most sense for their students. Publishers must develop new business models that make sense for schools as well as themselves. And schools will need to put new IT tools and processes in place for

controlling, managing, and delivering the content to students, while securing confidential data in a cost-effective manner. With the right infrastructure in place, schools can maximize the impact of technology and prepare students effectively for the world of tomorrow.

eTextbook Movement Gains Steam

The push for digital textbooks comes from many directions. The federal government has determined that moving to eTextbooks is in the best interest of the country. In October 2012, U.S. Education Secretary Arne Duncan urged the nation's schools to move to digital textbooks as quickly as possible. That outlook has filtered down to the state level. Florida state education officials recently rolled out a five-year proposal calling for all K-12 students to use only electronic materials delivered by Kindles, iPads, and other similar technology by 2015.

The advent of low-cost electronic readers and the emergence of the "Bring Your Own Device" movement have brought the dream of a device for every student closer to reality. No longer must students work with outdated textbooks; instead, content can be delivered on sleek tablets and other devices. Cumbersome backpacks disappear as students tote devices weighing just a few pounds.

Changing the Education Equation

With these new interactive tools, the learning process changes for the better. Digital textbooks are about much more than "turning a textbook into a PDF," said Christine Willig, senior vice president of products at



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McGraw-Hill Education. "Digital formats provide schools with many ways to enhance education."

Books become intelligent. Adding search capabilities allows students to find contextual information about terms they might not understand, or supplemental material needed to complete assignments. Textbooks also can include animations, simulations, and interactive exercises.

eTextbooks become study aids. Students gain new interactive fea-

tures, such as automatic flash cards, dictionaries, the ability to annotate text, and even automatically generate journals of their notes.

Course materials are more pliable. Students can adjust the presentation of material; for example, a student with poor vision can increase the font size and make the text easier to read.

Integration with learning management systems is possible. LMS integration enhances the feedback

process. LMS can assess the learner's knowledge and abilities; identify appropriate learning goals; identify and sequence instruction appropriate for each learner; store evidence of attainments; support collaboration; and generate reports that maximize the school's effectiveness.

School becomes 'cool'. "Students spend all day interacting with digital content via iPods, iPads, and computers, but schools hand them a piece of paper and a pencil," said David Straus, vice president of products at Kno Inc. Rather than working with printed textbooks, students

single-page displays that enable struggling students to focus on one page at a time and not worry about the pages to come.

Students become more engaged. In theory, this new learning model can improve student performance, and the early results support that premise. "We have seen 10-percent increases in student achievement within a few months," stated Michael Chai, chief digital learning officer at Pearson.

Updates are easier to make. Information changes so quickly that some textbooks are out of date almost as soon as they are published. With digital content, schools can keep lessons relevant and timely.

Schools have the potential to save money. Printed textbooks are expensive to produce and costly for schools to buy. In other markets, such as music CDs and consumer books, pricing has dropped as vendors have moved from traditional to digital formats. One possible parallel is Apple's iTunes store, which led to a dramatic change in how music is consumed and its costs. In January 2012, the industry giant opened an eTextbook store—and observers expect a similar scenario to unfold with how educational content is priced and distributed.



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Teachers are freed to give more individual instruction and feedback.

A key classroom challenge has been how one teacher can serve dozens of students effectively. In the digital age, students can work independently or in small groups more easily, and teachers are free to circulate around the room and offer help as needed.

can use the same empowering technologies for learning that they play with at home.

Special-needs students can get the help they require. Digital textbooks offer features that can help special-needs students, such as text-to-speech capabilities or read-along highlighting. eReader devices offer

Barriers to Adoption

Yet, despite these promises, few schools currently take advantage of digital textbooks. MBS Direct Digital found that digital textbooks accounted for about 6 percent of K-12 textbook sales in 2012. “We are at an early stage of adoption,” said Rob Reynolds, director of MBS Direct Digital. “Many schools are just beginning to look closely at what digital content offers them.”

A variety of business and technical challenges stand in the way of adoption.

First is a lack of content. Current textbooks need to be updated and enhanced to run on portable devices. Publishers must add the various electronic amenities—such as search capabilities, links to websites, and embedded assessments—to their books. Many publishers have started this process though clearly much work remains. (As of February 2013, for instance, Apple’s iBooks store contained 39 math textbooks, but only six from Pearson or McGraw-Hill, two of the three major K-12 textbook publishers. There were 37 humanities textbooks, but none from Pearson or McGraw-Hill.)

Publishers also must find a way to provide content that works on a variety of endpoints. For instance, some flash-based content might be



limited to PC and laptop devices. This format would not work for schools that have tablets or iPads. To avoid a negative outcome, schools should consult with publishers prior to investing in hardware to ensure the format of the digital content is compatible with these devices.

What’s more, some of the benefits associated with consumer eBooks do not translate to the academic market, so new business models must be developed. “With an eBook, one person reads it; typically, textbooks are used by several years of students,” said McGraw-Hill’s Willig. Consequently, it is difficult—or, in many cases, impossible—for schools to purchase multiple copies of a book for use by multiple students in different years.

These issues eventually will be

resolved. The more significant challenges stem from IT issues. Handing computers or tablets to students is a bit like opening Pandora’s Box; schools find themselves facing a number of new administrative challenges.

First, school leaders must decide how to equip students. What kinds of devices do they supply: tablets, eReaders, smart phones, or laptops? Which devices do they allow students to bring themselves? Do parents buy these devices for their children? Do schools purchase them? Should school districts choose a combination of these options?

In choosing devices for students, school leaders should pay attention to compatibility with digital textbook file formats; for instance, content from Apple’s digital textbook store can only be viewed on iPads. Most

devices, including iPads and other iOS systems, support the open ePUB file format, which is quickly becoming an industry standard—but Amazon's Kindle eReader does not.

Once school leaders have made their decision, they'll need to track those assets. They need visibility into the device: They must know where it is, what is on it, and how it is being used, because a variety of threats loom.

Theft is a concern. Between 2007 and 2011, 1,000 laptops were stolen from the Los Angeles Unified School District. From 2009 to 2011, 400 laptops were taken from Detroit Public Schools. In 2011, more than \$20,000 worth of computer equipment was stolen from two New York City schools during a four-day weekend.

This type of crime is not limited to large, urban settings. In Virginia, a

man was indicted for stealing 111 computers from the Albemarle County Public Schools. In Hamilton, Ohio, a man pleaded guilty to stealing 400 laptops from the Middletown City Schools in 2011.

Students can cause mischief. They might want to download personal content onto their devices, which increases the likelihood of malware running amok on a school or district network.

Securing & Managing the Devices

To combat these problems, schools need tools that deliver insight into what is installed on a user's device. They need to be able to check that configuration against a baseline to ensure compliance and proper use of the system. IT staff also need to know if software license quotas have been reached; if these are exceeded, schools could face fines. Absolute Software's Computrace and Absolute Manage solutions deliver these needed features:

Asset Administration

- Provide a centralized console to monitor device status.
- Collect asset information, such as user ID, physical location, and the installation of any software or hardware that does not comply with school guidelines.

Data & Device Security

- Delete sensitive data on devices at risk or at end of life.
- Produce an audit log or end-of-life certificate to prove data have been properly deleted.
- Freeze a device and send a message to the IT department, if problems arise.

Geotechnology

- Track assets on an internet map illustrating current and historical locations.
- Build "geofences" and receive an alert if a device strays beyond a pre-set boundary.

Computer Forensics

- Forensically mine for a stolen or missing computer, regardless of user or location.
- Use key captures, registry and file scanning, geolocation, and other investigative techniques to understand how and why a device was breached.
- Determine who has the computer, what they're doing with it, and whether any data was accessed.

Theft Recovery

- Investigate thefts.
- Provide the results to local police.
- Recover stolen devices or provide a service guarantee of up to \$1,000 if a recovery is not successful (some conditions apply)
- Absolute has participated in more than 28,000 successful device recoveries.

With Absolute Manage, school IT staff can remotely manage and secure all of their endpoints (PCs, Macs, iOS, Android, and Windows Phone devices) from a single console. With this consolidated view, they can determine the status of each device, manage typical IT maintenance requirements, and take immediate action as needed.

Absolute's solutions are used in many districts, and the results have been noteworthy. "It would be impossible for us to manage thousands of laptops without a complete software solution," said Mike Pitroff, chief technology officer for the Baltimore City Public School System. "At the time of deployment, we worried about the high cost associated with device theft and the risk of sensitive data on teachers' laptops getting into the wrong hands. It was easy to implement Computrace, and we've since built the software into our district's core IT infrastructure."

Prince George's County Public Schools in Maryland reduced computer losses by approximately 95 percent per year, saving nearly \$100,000 in capital expenses.

Kansas City Public Schools Prepare for the Future

The Kansas City Public Schools, which serves 16,700 students, is at the front of the digital content movement. Officials there view eTextbooks as a way to revitalize the district.

"eTextbooks offer us a way to bring more students into our system," said Craig Nulan, IT operations manager for the Kansas City Public Schools. At one time, enrollment was more than 70,000 students, but parents have been homeschooling their children or choosing them out of the district.

Nulan and his colleagues have been talking with publishers, tablet vendors, and software suppliers as they put a plan in place to revamp the district's curriculum and classrooms. In April 2013, a pilot program is slated to run with up to 360 students at two elementary schools and two high schools. Teachers will work from interactive whiteboards, students will be outfitted with tablets, and a new pedagogy will take shape.

"While we still have to answer a number of implementation questions, we are totally convinced that the advent of digitized content will greatly improve our ability to engage students in the classroom," Nulan concluded.

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For more information about how to manage and secure this digital technology, visit <http://www.absolute.com/products/absolute-manage>