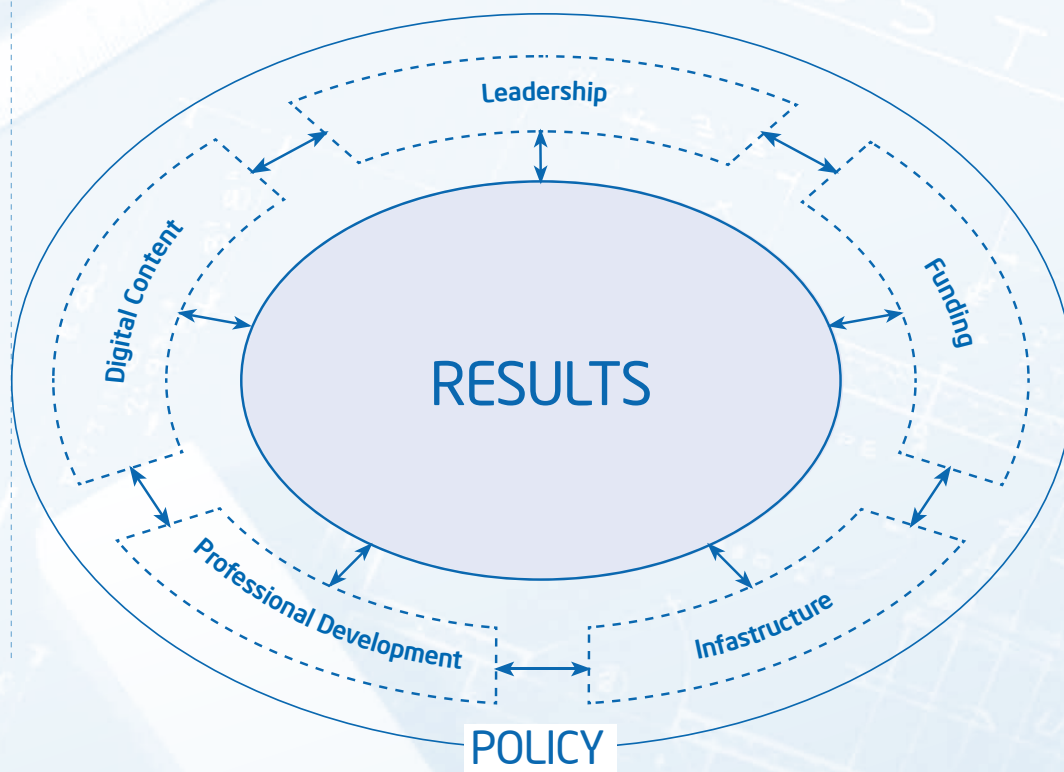


Blueprint Solutions

Digital Content in the K-12 Classroom



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1 THE PROMISES OF RICH DIGITAL CONTENT

The invention of the printing press in the 15th century revolutionized communication and education, providing the world at large – not just a privileged elite – with widespread access to books and the knowledge contained within them. Today's digital technologies are, once again, revolutionizing the way people communicate and learn, causing many education experts to re-examine the role of print content in the classroom.

WILL PRINT TEXTBOOKS DISAPPEAR?

With a number of states now offering schools the option of purchasing digital content and equipment with funds previously earmarked for textbooks, some are predicting the demise of the print textbook as we know it today. How likely is this? And how desirable? Critics of textbooks point to the following drawbacks:

Cost: K-12 textbooks cost the state of California over \$400 million/year according to the California Open Source Textbook Project, while the Texas Education Agency (TEA) reports that Texas schools spent \$621 million in 2006-7 and, on average, about \$500 million/year on textbooks. And costs are rising. Between 1986 and 2004 college textbook prices nearly tripled. While less precise numbers are available for K-12, the trend is alarmingly similar.

Size and weight: According to a 2001 study by the Simmons School of Health Sciences, "Many school children are carrying backpacks far too heavy for their developing bodies" – exceeding the 15 percent of body weight recommended by American Academy of Orthopedic Surgeons. Tremendous amounts of time and energy are consumed loading and unloading pallettes of new textbooks as they are delivered to districts and schools, distributing books to individual classrooms, and having students sign books

in and out in order to track their location. Valuable warehouse space – complete with energy-consuming climate control equipment – is typically required to store thousands of textbooks during summer months and serve as an ongoing repository for unused and unwanted books.

Lack of flexibility: As new students enroll or textbooks are lost, it is difficult to respond quickly. For example, according to the California Performance Review, in 2005 more than half a million students did not have textbooks to use in class and approximately 2 million could not take textbooks home to do homework. With California, Texas and Florida representing close to 30 percent of the textbook adoption market, it is hard for districts in other states to find texts customized to their standards and needs. The fact that the typical adoption cycle is at least six years means that students are perpetually learning with textbooks that are out-of-date – and in some cases, entirely obsolete.

Even those who are convinced that textbooks will continue to play a role in education for many years to come expect that digital content – from digitized versions of the textbooks themselves to multimedia content that used to be viewed as merely "supplementary" – will become increasingly prevalent and important. Whether such content replaces the print textbook or simply lives side-by-side with it remains to be seen.

The textbook – the staple of the 20th-century classroom – is losing ground to digital alternatives. (See "Will Print Textbooks Disappear?") Higher education has led the charge away from print, driven by student concerns about the rising cost of books required for college classes. According to a September 2, 2009, article in the Washington Times ("Digital Texts Could Turn the Page on Print Costs"), "Booksellers say they see a palpable backlash against the cost of paper books, which quickly go out of date and cost the average college student about \$1,000 a year."

In response, publishers of college textbooks have begun offering a variety of digital options. McGraw-Hill, Pearson and a number of other publishers now sell entire books or individual chapters in digital format, and several companies have worked together to launch CourseSmart LLC, which offers thousands of textbooks online in an e-book format.

While not as common in the K-12 market, e-textbooks are becoming an option there as well. Their appeal to schools that have one-to-one or other technology-rich implementations include lighter backpacks for students and the ease with which the texts can be distributed, stored and updated.

FAST FACT

A Simmons College report in February, 2001, found that 55% of students carried an overloaded backpack and others estimate that the problem is more common than that.

According to a survey by the American Academy of Orthopedics:

- 71% of doctors feel backpacks are a clinical problem for K-12 students
- 58% see patients with pain related to backpacks, and
- 52% think that the problem is serious.

And yet, while e-texts address some of the problems of print, many people feel that they do not go far enough. In the college world criticisms range from concerns that the price for the digital version of a book is still not low enough, especially considering the fact that it can't be resold, to dissatisfaction with the hardware platform on which the e-textbooks are viewed. A July 20, 2009, article in the Wall Street Journal cited dozens of students from a Northwest Missouri State University e-textbook pilot who "dropped out of the program, complaining that the e-texts were awkward and inconvenient" and an assistant dean for

scholarly communications at Penn State University Libraries who, after observing student and professor reactions to a similar pilot on the Penn State campus, declared the eBook readers to be “not fully functional for a learning environment.”

Such concerns are even greater in a K-12 learning environment where educators strive to support multiple learning styles, engage students through a variety of media, and teach them to be sophisticated consumers, interpreters and users of content. Digital learning environments are the key to addressing what one might call the “three C’s” of learning; 21st-century schools are charged with teaching students to:

- *Consume* (read and interpret text and imagery)
- *Collaborate* (share what they’ve learned and work with others to extend their knowledge)
- *Create* (demonstrate understanding by synthesizing and using higher-order thinking and creativity skills to build new content)

Merely consuming content – from printed or digital texts – is primarily an internal and passive way of learning and neglects the other two C’s: collaboration and creation. As *Educause Review* put it in a 2008 article looking at the lack of multimedia and creativity in e-textbooks: “E-text readers occupy a niche new to computers but old in the classroom: that of the ordinary textbook.”

2 FINDING THE RIGHT SOLUTION

In order to transform today’s classrooms into appropriate 21st-century learning environments, we need to provide students with rich digital content that goes far beyond digitized print textbooks

delivered over scaled-down devices. In making the move to digital content, it is important for schools to consider two factors: the ideal platform and the form in which the content is delivered.

Budget-conscious schools might be tempted to

COMMON FEATURES OF DIGITAL CONTENT INCLUDE:

- Multimedia elements such as still images and graphics, video, virtual reality, animations, simulations, audio, music, interactive, and gaming elements;
- Embedded tools (survey, calculator, spreadsheet, etc.) to facilitate student highlighting, annotating, calculations and more;
- Additional tools (wikis, video/graphics editors, academic networking tools) to support collaboration and creation;
- A variety of languages;
- Adaptive and assistive technology designed to meet special needs;
- Embedded links to external sources and access to remote experts and mentors;
- Technologies that evaluate student responses, provide customized content and redirect students to data-indicated areas of need;
- A seamless continuum of instruction and assessment;
- The ability to be updated and enriched continuously and seamlessly;
- Site licenses or subscriptions that ensure a dependable supply of “perfect” copies;
- The ability for teachers to search, sort and select by standards-based needs and queries;
- Options for exporting, reformatting and combining text and other content so it can be used beyond the original package for presentation and dissemination in various ways.

purchase “inexpensive” e-text readers or netbooks with fewer features than full-fledged computers, but such a move can actually cost a district more if the new devices do not meet all the needs of the students or teachers who will be using them. In selecting a mobile device for classroom use, it is important to view it as a total learning platform and look for a device that supports all three C’s and a variety of curriculum uses, not just one of them. It is possible that child-friendly netbooks such as Intel-powered Classmate PCs are the ideal solution for primary grade users but likely that secondary grade students will need full-fledged notebooks or tablets that offer the flexibility to do everything from cut, paste and annotate text-based content to create multimedia projects and participate in global collaboration.

Rich digital content can take many forms. It can be provided in standards-based packages that build upon textbooks, with teacher’s guides, assessments and multimedia content all included and aligned to standards. It can be created collaboratively, in open source format, by a variety of experts. Or it can be drawn from multiple sources – subscriptions, free online resources and other digitized material – customized locally to meet the needs of a particular classroom, grade or district.

Rich digital content, delivered on flexible mobile computers, can revolutionize the ways in which elementary, secondary and post-secondary age students learn and grow. The most effective digital learning environments bring together the three C’s of consumption, collaboration and creation by:

- Engaging students through a rich and varied array of innovative media and learning experiences;
- Being flexible and adaptable, allowing students to learn at their own pace, and in their own style;

- Offering teachers and administrators the power to select and modify content as desired;
- Connecting students with outside resources as well as experts and mentors to support their learning;
- Providing a seamless continuum of instruction and assessment, thus providing data to inform teacher practice and improve student performance;
- Offering opportunities for students to share ideas and collaborate with one another through such tools as wikis or social/academic networks;
- Challenging and motivating students to create their own meaning in the form of blogs, multimedia presentations or other original content that builds on what they have learned and is delivered to an authentic audience.

3 THE K-12 SHIFT BEGINS

Our nation's financial crisis has forced a number of states – including several of the 22 “textbook adoption” states that make centralized purchasing decisions – to reconsider the role of textbooks in the classroom. During the 2009-2010 school year, for example:

- Florida provided districts the flexibility to postpone the purchase of the scheduled language arts curriculum materials if certain criteria were met;
- Oregon told districts that they could postpone textbook purchases for two years;
- Idaho implemented an 82.4% reduction of funding for both print and non-print state approved instructional materials;
- California legislators approved a four-year suspension of the textbook adoption process and allowed district officials to forgo purchasing

OPEN SOURCE AND OPEN EDUCATION RESOURCE CONTENT FOR K-12

For schools looking to tap into – or create their own – free and open digital alternatives to textbooks, the following open source programs and open education resources (OER) are worth checking out:

- **BioQUEST Curriculum Consortium (<http://bioquest.org>)**
These open educational resources are designed to help high school and college students study biology by posing and solving problems and communicating with peers.
- **CK-12 Foundation (<http://ck12.org/flexr/>)**
Using an open-content web-based collaborative model, CK-12 allows users to create customized “FlexBooks” that take the place of traditional textbooks. The state of Virginia worked with CK-12 to develop a 21st Century Physics FlexBook and the California Free Digital Textbooks Initiative listed a number of FlexBooks in its review of free alternatives to textbooks.
- **Connexions (<http://cnx.org/>)**
One of the first OER resources, Rice University's Connexions offers mostly higher education content but also some high school materials. Content is available in modules (“knowledge chunks”) and collections of modules grouped into courses.
- **Curriki (<http://www.curriki.org>)**
Curriki features open source and other free instructional materials (resources and courses) especially for the K-12 market.
- **FreeReading (<http://freereading.net>)**
Adopted by the state of Florida in 2008 as a state-approved K-3 supplemental reading program, FreeReading is an open source early literacy program with free research-based lessons from a variety of sources.
- **Hippocampus (www.hippocampus.org)**
An open education project from the Monterey Institute for Technology and Education, Hippocampus offers multimedia lessons and course materials to high school and college students free of charge.
- **The Math Open Reference (<http://www.mathopenref.com/>)**
This free interactive math textbook prototype covers high school geometry and plans to expand to other areas of math. The interactive books promise to include text, interactive quizzes, digital manipulatives and more.
- **Wikibooks (<http://en.wikibooks.org/>)**
Wikibooks is a wikimedia community for creating free education textbooks. Some examples of particular interest to K-12 include: High School Mathematics Extensions, Geometry of Elementary School, and basic Spanish and Physics classes.

instructional materials altogether and use the money instead on staffing and other critical areas to offset funding cuts.

In addition to offering schools the flexibility to spend previously earmarked funds on things other than textbooks, a number of states have actively moved to encourage the development of digital alternatives. In California, for example, Governor Schwarzenegger launched the Free Digital Textbook Initiative to “give school districts high-quality, cost-effective options to consider when choosing textbooks for the classroom – not only during these difficult economic times but in the years to come.” Organizations that were willing to provide free digital content in the areas of math and science (the subjects scheduled for adoption in 2009) were asked to submit their e-textbooks to the state-appointed California Learning Resource Network (CLRN), which reported on how well they met state standards.

Although the primary impetus in such state initiatives may be cost-cutting,

FAST FACTS

As of early 2010, there were 1.7 billion Internet users (<http://www.internetworldstats.com/stats.htm>) and 206 millions web sites (www.netcraft.com). There were also:

- 126 Million blogs on the Internet (www.blogpulse.com)
- 3 Billion photos uploaded to Facebook (<http://www.facebook.com/press/info.php?statistics>)
- 1 Billion videos served daily by YouTube (www.youtube.com)
- 273 Million unique visitors to Facebook/MySpace/YouTube (<http://blog.compete.com/2010/01/25/list-of-top-50-websites-in-december-2009/>)

there are clearly philosophical reasons as well, as education leaders focus on the importance of 21st-century skills and the challenges of keeping today's technology-savvy students engaged in learning. With a vast and growing array of engaging, multi-faceted content available online today, it is easy to question the value of static, hard-to-update textbooks.

In the fall of 2008, Indiana was one of the first states to make a bold statement about the need to rethink the traditional textbook model. After reviewing social studies textbooks for a scheduled 2009 adoption, the State Board of Education

refused to adopt any, noting that “as a group they do not provide content that is interesting, engaging and supportive of effective student learning.” Early the next year the board issued “An Open Letter to Indiana Educators about Textbooks, Computers and Instructional Materials” in which it suggested that the “standardized form” of social studies textbooks “may jeopardize both student interest in history as a subject and the effective learning of the country's principles and values...” and encouraged schools to consider alternatives. They also issued a blanket waiver allowing school districts to use multimedia, computer and Internet resources to supplement or replace traditional textbooks.

More recently, Texas made news with the passage of HB4292, which changes

TYPES OF DIGITAL CONTENT

Here are some examples of digital tools that allow for adaptive, personalized, and engaging learning experiences for K-12 students:

Category	Some Examples	
Comprehensive Instructional Software	<ul style="list-style-type: none"> ▪ Destination Success (Houghton Mifflin Harcourt) ▪ SuccessMaker (Pearson) ▪ Breakthrough to Literacy (McGraw Hill) 	
Sheltered Search and Content Libraries	<ul style="list-style-type: none"> ▪ Questia ▪ NetTrekker ▪ ABC-CLIO ▪ ProQuest K-12 	
Video and Multimedia Collections	<ul style="list-style-type: none"> ▪ Safari Montage ▪ Discovery streaming ▪ BrainPOP 	
Games, Experiments and Simulations	<ul style="list-style-type: none"> ▪ Muzzy Lane ▪ ExploreLearning ▪ PASCO Scientific 	
Online Classes	<ul style="list-style-type: none"> ▪ Apex ▪ OdysseyWare Online 	<ul style="list-style-type: none"> ▪ Florida Virtual School ▪ Education 2020
Tools for Publishing, Analyzing, Collaborating and Visualizing/Modeling	<ul style="list-style-type: none"> ▪ Google apps ▪ Microsoft Office ▪ Open Office ▪ Adobe Creative Suite 	<ul style="list-style-type: none"> ▪ Inspiration ▪ GIS for Education (ESRI) ▪ Various wikis and social networking tools
Curriculum Management and Assessment Tools	<ul style="list-style-type: none"> ▪ DyKnow ▪ EDMIN ▪ Blackboard ▪ Moodle 	<ul style="list-style-type: none"> ▪ Project Tapestry (Pearson) ▪ Qwizdom ▪ elnstruction ▪ EduWare

state regulations so that, instead of providing every student with a textbook for each core subject, districts are now required to provide all students with access to “textbooks, electronic textbooks, or instructional materials that cover all elements of the essential knowledge and skills adopted by the State Board of Education for that subject and grade level.” Although materials must still be purchased from state-approved lists, a second commission has been established to consider non-traditional materials that meet Texas standards. The legislation also says that state textbook funds may be used to purchase technological equipment necessary to support the use of electronic textbooks or instructional material included on the approved lists.

As of early 2010 Georgia was considering similar legislation. If passed, SB 319 would require the Georgia Board of Education to broaden their definition of textbook to include computer hardware and technical equipment necessary to support the use of non-print or digital content.

4 DIGITAL CONTENT CASE STUDIES

What follow are examples of forward-thinking districts that have incorporated rich digital content into their vision for teaching and learning.

Irving ISD, TX

In March, 2009, as the Texas legislature was beginning debate on the pros and cons of allowing schools to spend textbook money on technology, The Dallas Morning News ran a story on Irving Independent School District – or, more specifically, on the textbooks sitting unused in the district’s warehouses. Irving ISD has been a trailblazer in

the area of one-to-one computing. Its high school laptop program currently serves approximately 9,000 students and is in its ninth year.

“The state spends millions of dollars every year on textbooks school districts don’t need, but they have to take them because it’s the law,” began the news commentator, who went on to explain the disconnect between Irving ISD’s increasingly savvy students and the state law (at the time) requiring schools to purchase one textbook per student in every major subject area – whether the book was being used or not. Irving ISD’s challenge was that it was ahead of its time. With many of its students having access to laptop computers on a 24/7 basis, the district’s teachers were finding it preferable to send students home with computerized versions of texts rather than heavy, easily-lost textbooks.

In addition, says Irving ISD’s Executive Director of Technology Alice Owen, the faculty – even those teaching elementary and middle school students where the computer-to-student ratio was not one-to-one – has really shifted its teaching approaches away from textbook learning. “They’re using a wide array of digital content,” she says. “Students are taking charge of their own learning – collaborating, innovating and publishing, as well as learning from experts in the field.”

Not only does this shift better prepare students for the 21st century, it has the potential to save the district a tremendous amount of money. In their newscast, The Dallas Morning News reported that the cost of the 146,000 unused textbooks in the warehouse was equivalent to 15,000 new laptop computers. With the passage of HB4292, the district can finally use the money for such technology-based tools.

Vail School District, AZ

Arizona’s Vail School District made its own news in 2005 with the opening of Empire High, hailed by many as the nation’s first textbook-free high school. Committed to one-to-one learning, the school’s planners needed to find money for student laptops and one place they looked was at the textbook budget. Textbooks for the four-year program would have cost about \$500 per student, according to Vail School District CIO Matt Federoff. Instead of buying the textbooks, the district opted to use that money for hardware – and to design a digital curriculum that eventually evolved into a district-wide initiative known as “Beyond Textbooks”.

Beyond Textbooks involves an extensive database built around state standards with formative

FAST FACT

Bailey Mitchell, chief technology and information officer for the Forsyth County Schools in Georgia, explains, “We spend about \$81 per student each year on textbooks but only \$19 per student on all of the digital content we subscribe to – and that includes a broad collection of multimedia resources, databases and interactive lessons.”

– Quoted in the 2009 CoSN Compendium (www.cosn.org), “The Future of Textbooks: Evolutionary, Revolutionary or More of the Same.”

assessments linked to each one. “What we used to do,” explains Federoff, “is to take existing materials and try to shoehorn them into state standards. Now

we're starting with the standards, and looking at the best ways to teach each of them. We call this 'inverting the curriculum.'"

"No vendor can provide it all," Federoff explained to the editors of K12 Computing Blueprint. "Think iTunes: we don't buy albums, we buy songs. I want the Civil War from one vendor, but I want WWII from another ... the best bits and pieces from multiple sources that most closely match our instructional goals."

While Beyond Textbooks contains some premium content from subscription services such as Discovery Education Streaming, ABC-CLIO and BrainPOP, by far the largest component of the database is a vast variety of free content and teacher-created materials, as well as comments from other teachers about what they liked about a particular lesson or how they've altered or built upon it to make it better. "We don't expect to get everything for free," says Federoff, "but we're only going to pay for those specific materials our teachers have identified as being truly worthwhile"

School of One, NYC

Differentiated learning is a goal for many schools today and few take it as seriously as the designers of NYC's School of One, a pilot program that is part of the NYC21C school reform initiative aimed at innovating instructional practices to prepare students for careers in the 21st century. Piloted at one school in the summer of 2009, School of One is scheduled to expand to three sites in early 2010, five during the 2010-11 school year and up to 20 schools in three years.

In the School of One model, students take a diagnostic exam to determine the learning goals they need to work on – this is called the playlist. Students also complete a learning profile that indicates how they like to learn, their interests, and their learning

styles. Each day, optimization software looks at what playlist items are needed based on the prior day's assessment (for example, five students need to work on multiplying fractions while 10 are up to adding fractions) and creates new classes to meet those needs. When lessons are provided to the students, they are matched to the students' learning profiles to further enhance personalization. (For example, of the five students who work on multiplying fractions, two might prefer live instruction while three prefer fraction games.) Over time, the system will use assessment data to determine which lessons are most effective, with the ultimate goal of creating a vastly more efficient and engaging learning experience for both students and teachers.

Is there a role for textbooks in this learning model? According to Jonathan Skolnick, manager of program operations, "School of One is based on the theory that while computer-based instruction plays an important role in individualizing instruction, it should not be the only way, or even the most important way, that students learn. Students who learn best from live instruction with teachers, or with workbook or textbook materials, are assigned them as needed."

While not ready to do away with textbooks as content sources, Skolnick agrees with Federoff that a modular approach that takes advantage of digital content is needed. "Digital textbooks help us deal with the logistical challenges of printing out different worksheets from different textbooks for different students, because students can access the digital material through a customized portal. Our program tags each workbook or textbook lesson with certain attributes so that we can match it to particular student needs. Over time, we can create a

marketplace of different textbook vendors and select the best lessons from each. A student might receive a fractions lesson from one vendor's textbook and a geometry lesson from another vendor's textbook. This may enable us, down the road, to pay vendors on a per-use basis, with the most successful lessons being deployed most frequently."

Auburn City Schools, AL

Auburn City Schools' 21st Century Learning Initiative is designed to "prepare ... students and educators to be contributing members of an ever-increasing technological and global society through an anytime, anywhere learning environment." Central to the program, which puts mobile computers in the hands of the district's 8th and 9th graders for 24/7 use, is the shift to such 21st-century content tools as:

- Digital and digitized curricular materials and subscription services;
- Self-paced lessons, modules and courses;
- Sandbox space on the Internet for new kinds of communications exchanges and new on-line communities that meet safety and quality requirements;
- Educational computer games and simulations that are educationally sound but still compete with games for entertainment.

The state of Alabama has long offered school districts the flexibility to use "textbook" funds to purchase software. "It's great to have that flexibility," says Director of Technology Debbie Rice, who explains that, in addition to other digital content, purchasing digital versions of textbooks has been a high priority for the district in recent years. As a result, she says, "all textbooks are loaded on the student units and

fewer textbooks are having to be purchased by the junior high. For example, in foreign language classes we've purchased one set per classroom instead of one book per student."

Dr. Jason Wright, principal of Auburn Junior High School, explains that, in contexts ranging from the classroom to faculty meetings, his school is committed to "a professional learning community approach, rather than a stand and deliver approach." Powerful 21st-century tools, including management software from DyKnow, rich digital content from a variety of sources, and an about-to-be-launched online web portal are all an important part of making such professional learning communities a reality.

New Canaan Public Schools, CT

In the New Canaan Public Schools, social networking and open source tools are having a significant impact on the way teachers teach and students learn. At the high school level in particular, says technology integration specialist Cathy Swan, "any class that chooses to have students hop onto a social network is welcome to do so." She acknowledges that many districts are afraid of offering such access but contends that "they are doing a huge disservice to their students who already live an environment of social networking and free Internet access. We believe that if we use these sites that are controversial and possibly dangerous to our kids, we can teach them to use them the right way. The School Board is very excited about the opportunities we offer our students and parents seem to approve as well."

Swan shares a number of examples: "Our AP Statistics classes post surveys to FaceBook and get 500 sets of results in a week! The band traveled to Rome this year and upon their return, spent a day in

the computer lab swapping photos on FaceBook. We have a Spanish teacher who is very excited about the change in classroom dynamics after implementing Facebook as the course platform for threaded discussion, messaging and storage of resources. Social studies classes have experimented with Wikia to write historical novels about the revolutions in South America. Students wrote in teams and were excited when somebody from the outside world visited their novel and made changes. Our librarian hosts an amazing website which includes a VoiceThread reading list where students can record their reflections and recommendations on what they're reading and select books based on recommendations they hear on the website."

Many teachers host their courses on Moodle, the open source course management tool that is widely used in the district. "Our goal this year," says Swan, "is to have all students enrolled in the library Moodle. We also have all freshman enroll in the Health Moodle to participate in a three-month wellness project that uses mypyramidtracker.gov." District teacher Kristine Goldhawk has done a lot to help her fellow teachers learn how to use Moodle for their classes – including working with Turnitin to refine a Moodle module that lets educators and students check written work for improper citation or plagiarism.

Textbooks have not been abandoned entirely; many teachers still use them. But a natural evolution is occurring, as described by three New Canaan teachers:

The textbook has become just one of many various resources available to students. My students use voicethreads, links to other teachers' vlogs, and instant messaging to seek help and additional examples.

I rarely, if ever use, textbooks anymore. Using Diigo

or Moodle, my students have access to rich primary and secondary sources that are more relevant to our study than the textbook. Plus both allow for threaded discussions on the reading. Diigo is particularly helpful because of the highlighting and comment ability. I find that students retain more information reading this way rather than from a textbook they find boring.

Students can access textbooks online so they are able to leave a set in the classroom at all times. They can also access other supplemental materials online – so the textbook has played a smaller role in the class.

Kent School District, WA

Kent is another district where teaching and learning has changed tremendously as a result of digital tools and an innovative rethinking of the curriculum. Launched in 2005 with a single middle school academy, Kent's one-to-one computing program now serves all 7th and 8th graders district-wide. A key goal of the program from day one has been to address equity issues in this diverse district, reducing the rate at which students drop out of school and helping to keep them engaged and successful by: promoting active and real-world learning; differentiating instruction; giving students choice about what they learn; reforming assessment; engaging students in conceptual and in-depth learning; and providing a sense of belonging. Rich digital content is an important part of this new approach.

According to Dani Pfeiffer, the district's director of school technology services, "There has been a gradual shift in the use of textbooks in our 1:1 classrooms. The large majority of teachers use the texts as a resource since content is frequently outdated. They rely more heavily on more current resources available on the

Rich digital content is a powerful way of providing today's students with high quality, relevant and up-to-date instructional materials.

web. Additionally, the ability for students to actually experience through simulation or visually 'see' what the educator is teaching makes it easier for them to grasp newly introduced concepts."

To the extent that textbooks still play a role in the 1:1 classroom, the district's eventual goal is to have them available digitally. "In some cases," says Pfeiffer, "texts that are used in the classroom are already available online as an e-text and come without additional cost because of our initial purchase. Other texts have been in circulation for quite some time and are not available in digital form. When we find this to be the case, we contact the publisher directly and ask if they would give us written permission to digitize the text using a purchased digitizer."

In addition to the one-to-one program, a number of high school students in the Kent schools participate in the Kent Phoenix Virtual Academy. The content is provided by Odyssey Ware software and portions of online tools and texts, with traditional texts acting as an additional resource. Pfeiffer explains that widespread access to "limitless information" in Kent's 1:1 and virtual programs has helped students learn to "think more critically in order to decipher information that is truly based on fact. Additionally, the ability to demonstrate their understanding of a particular

skill or content area has increased. No longer are students required to simply demonstrate their understanding with paper and pencil tests. They may create a movie, participate in a blog or wiki, create a 3D object, animation or game, or share their content knowledge and understanding to a group of students several thousand miles away. Moreover, we have found great success with the ability to differentiate instruction and tailor every lesson based on each student's academic level."

5 GETTING THE BEST FOR LESS

Rich digital content is a powerful way of providing today's students with high quality, relevant and up-to-date instructional materials. Through multimedia elements and interactivity, it engages students and addresses multiple intelligences and learning styles. Through embedded and seamless assessments – both formative and summative – it enables data-driven instruction and, with the support of appropriate professional development, informs teacher practices. And through the use of a new generation of creative and collaborative tools, it encourages students to be active learners who refine, demonstrate and share their understanding with others.

At the same time, digital content offers states and districts the potential for genuine savings by cutting back on an expensive line item and replacing it with a better and less costly alternative. No longer will schools need to rely on an "all or nothing" adoption approach that forces them to select – and stay wedded for years to – a single text from a single provider. Instead, they will have the opportunity to pick and choose

"best of breed" solutions from a variety of sources and pay incrementally for updates as they are needed.

Never has the need been greater to conserve precious dollars while delivering high-quality learning experiences to students in our nation's schools. Rich digital content gives us the opportunity to do both.



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