



POWERING UP TECHNOLOGY

New opportunities take learning
into the 21st century

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Educators face a dazzling array of new opportunities in information technology that can help them pique students' curiosity and infuse the skills and content they need. No one doubts that new gadgets will delight young people—but for educators, the question is how can technology best be harnessed to teach subjects like writing, reading, mathematics, science and social studies in a cost-effective manner?

Although it's been around for about a decade, the free Internet telephone and video conferencing service Skype appears to be gaining traction in the past few years as a way to widen students' worlds without setting foot outside the classroom. Schools have been using the service to provide everything from face-to-face interactions with authors to video meet-ups with classrooms from around the world.

Electronic textbooks have begun to gain more adherents in the past few years as a potentially more cost-effective and interactive—not to mention lightweight—way to bring content to students across the spectrum of subjects. Apple's announcement in January 2012 that it had reached an agreement with three major publishers to distribute their content through its iBooks service seems destined to accelerate that trend.

Architectural solutions for the large volumes of data and images that schools and school districts need to access have leaped forward in the 2010s as well. Schools have moved to the Internet-based “cloud,” opening up opportunities like distance learning, interactive and “many to many” learning and open-source online content, and adding to the growing expectation that users will be able to access information and files anytime, anywhere.

“We need to cut the cord, so to speak,” says Bob Moore, director of global education at Dell, referring specifically to the cloud but using words that could apply to education technology more generally. “We need to be willing to rely on the next technology.”¹



THE HYPE — AND REALITY — ABOUT SKYPE

Perhaps Paul Simon should write a song about Skype. Blogger Kelsey Allen has at least come up with the lyrics for “50 Awesome Ways to Use Skype in the Classroom.”²

The first 10 have to do with promoting education: among them are video conferencing in the classroom, using an example of a teacher who taught about social inequality by showing the movie “Hoop Dreams,” then Skyped in movie executive producer Gordon Quinn to participate in a session with her class; long-distance collaborations with experts, including a 7th grade class that “met” virtually with the curator of the National Museum in Canada to work on a history project; taking virtual “field trips” all around the world; or communicating in foreign languages with native speakers.

Other ideas include promoting community: helping a classmate who can’t be in school feel included, like a 4th grader home sick with leukemia; gaining lessons in international cultures by giving students a virtual first-hand look at people’s homes, schools, clothing, weather and community festivals around the globe; and presenting performances to either their parents or “sister” classes in other parts of the nation or world—whether a play, science experiment or class project.³

Teachers and parents also can gain from Skype separately from in-classroom activities. Teachers can use Skype to access professional development opportunities, conference with parents who can’t come in person or whom they need to reach urgently, share students’ work with their parents, or collaborate with other teachers on projects. Mentor teachers can watch them via Skype and provide feedback, while busy parents can come into the classroom to make a presentation without having to leave work.

Skype offers a members-only directory for teachers to browse through and look for fellow teachers to whom they can offer help or who might be able to help them, along with a directory of resources including inspiring videos, links and classroom tips. Each teacher creates a profile listing interests, specialties and location, providing a link to partner classes, other teachers or guest speakers for a given learning activity, all keyword searchable.⁴

“Skype in the classroom was created in response to—and in consultation with—the growing number of teachers using Skype to help their students learn,” according to the Luxembourg-based Skype Technologies. “It’s designed to help like-minded teachers find each other, collaborate on projects and share inspiration and resources.”

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In March 2012, Skype announced a new partnership with DonorsChoose.org that will help Skype reach its goal of connecting 1 million classrooms worldwide. Skype is donating \$250,000 to teachers who ask for technology materials, such as laptops, netbooks and webcams, that will enable Skype video calling in their classrooms and help them connect with other classrooms, experts and teachers.⁵

Skype isn't the only company that offers voice over Internet protocol (VoIP) technology but it functions on a P2P rather than a centralized application, which enables computer users to communicate directly with one another rather than through a hub, aiding more robust communication, according to Educause Learning Initiative.⁶

About 250 million users are estimated to have created Skype accounts worldwide, about 10 million of whom are simultaneously using it at any one time, including a significant number of academics and researchers. “Learning becomes increasingly authentic as it expands beyond the walls of the classroom, and being able to have a phone call or a video chat with someone on the other side of the world can make learning come alive,” Educause says. “An inexpensive, widely accessible tool like Skype also encourages faculty and students to experiment with new techniques to facilitate engagement.”⁷

Educators express concerns that the “wow” factor of Skype might cause some to slouch into frivolous uses of the technology and urge their colleagues to think about specific educational goals that can be accomplished. “We can't let the abundance of connectivity keep us from thinking,” says Becky Fisher, director of education technology and professional development at Albermarle County School District in Virginia.⁸

Fisher and her fellow educators across the country who use Skype have been doing plenty of thinking about how to use it: virtual field trips aligned to a course curriculum in geography or social studies, hosting a book's author in an English class, keeping an absent classmate up to date in tough-to-catch-up-in math and science classes. “[The potential] is so endless,” according to Spanish teacher Colleen Blaurock of Perry (Ohio) High School, who connected her students with native Spanish-speaking students in nearby Painesville for regular, bilingual Skype conferences.⁹

One of the more frustrating aspects of Skype has been the lack of fellow educators with whom to connect. Skype responded by releasing in beta form in December 2010 a social networking Web resource called Skype in Education (it's now out of beta, but the company says it's still “very open to feedback”). Skype spokeswoman Jacqueline Botterill says the effort will become a hub for educators to connect with one another, gain best practices information and bring guests for virtual visits. “There are some really passionate educators out there who've been trying to do what we are doing,” she says. “We're just trying to help those communities come together.”¹⁰

E-TEXTBOOKS

As a recently minted purveyor of e-textbooks, it's no surprise that Apple would point out the downsides of paper textbooks. Schools must use them for several years to make them cost-efficient, Apple notes, but they get out of date as information changes and beaten up and dog-eared as they're passed from student to student. Not only that, but they can be pretty heavy in one's backpack, too.¹¹

The company's announcement on Jan. 19, 2012, that it had reached a partnership agreement with McGraw-Hill, Pearson and Houghton Mifflin Harcourt—three

major K-12 textbook publishers—has been compared to the relationship the company’s iTunes service has with major record companies. Featuring multimedia elements like video, photo galleries and three-dimensional graphics, the textbooks—which retail for \$14.99 or less—enable students to highlight text and to create flashcards to quiz themselves.¹²

At the unveiling of this new iBooks venture, which will display on an iPad device, officials demonstrated a science textbook called “Life on Earth” that features 3-D models of a cell that one can rotate by swiping a finger—and one can similarly expand a photograph into full-screen mode for a detailed view.

Publishers said Apple had made the right choice by involving them in creating the content.

“The common myth is that anybody can create quality content and curriculum,” said Lisa O’Masta, vice president of STEM (science, technology, engineering

and math) marketing. “The reality is there’s a lot that goes into what curriculum is created.”¹³

Some expressed concern that the creation of Apple-only textbooks would put cash-strapped districts in an even tighter spot. “Unless the economy significantly improves and the state governments have a load of money, I’m not sure where the districts will find money for \$400 devices, and textbooks,” said Osman Rashid, chief executive officer and co-founder of e-textbook company Kno, which targets higher education.¹⁴

Apple enters an increasingly crowded marketplace for e-textbooks, from smaller companies like Kno to the likes of Barnes & Noble. Simba Information, a publishing industry research firm, has estimated that sales of e-textbooks in U.S. higher education grew 44.3 percent to \$267.3 million in 2011, according to *USA Today*; the company also has estimated that they would account for more than 11 percent of the \$4.5 billion textbook market by 2013. Sales of e-books

SOCIAL MEDIA IN THE CLASSROOM

Educators know the current generation of teenagers and even younger “tweens” are voracious users of social media, and many of them see potential educational benefits of teacher-student contact over social media like Facebook or Twitter.

This can include everything from handing out assignments, to giving real-time homework support, to informal one-on-one learning that happens all the time without students necessarily noticing.¹⁵ Teachers also have the ability to reach out to a student in need, make connections with their family, give students a sense of how to deal with the world, and mobilize them to action for a good cause.

In the classroom, all students—but shy ones in particular—have benefited from features like running feeds on Twitter that are broadcast on a front-of-the-room screen while a teacher walks through a lesson.

Some have been concerned about distractions in the classroom and liability outside of it. That’s led school districts to ban cell phones and other hand-held devices during the school day, while restricting contact between students and teachers over social media beyond the school day.

The American Library Association begs to differ with that philosophy, asserting that prohibiting students from using social media “does not teach safe behavior and leaves youth without the necessary knowledge and skills to protect their privacy or engage in responsible speech,” adding in its policy statement that librarians and teachers “should educate minors to participate responsibly, ethically and safely.”¹⁶

Advocates for the use of social media would rather take the opportunity to teach “digital citizenship” so students learn how to use Facebook and other sites in a positive, constructive manner both inside and outside the classroom, with one another and with the world at large.



increased in the fall of 2010 but still remained a small percentage of sales at Barnes & Noble, says Jade Roth, vice president of books and digital strategy.

In addition to the Nook and Kindle, educators have turned to e-readers designed specifically for K-12 classrooms such as the Brainchild Kineo and the Franklin AnyBook Reader, the latter of which is aimed at elementary school students.

“E-book readers ... hold much appeal for education, and for the same reasons they are increasing in popularity with consumers: ever-improving features and growing capabilities for displaying a variety of content, for a fraction of the price of most full-featured tablet PCs,” wrote Kurt Eisele-Dyrli in *District Administration*. “School libraries in particular have led the way in implementing the devices, which have turned out to be useful tools to excite ‘digital native’ students about reading...

“Many e-book readers are also increasingly appealing to K-12 because of recent developments including the introduction of some of the first digital textbooks, new education-content partnerships between e-book reader manufacturers and education publishers, and recent legislation in states such as Indiana,

Virginia, West Virginia, Texas, California and Florida that include some sort of future mandate for digital content use—which could include digital books—in all public schools,” Eisele-Dyrli wrote.¹⁷

After Apple’s announcement, federal officials quickly announced a goal of getting digital books in every student’s hands within five years, and there were rapid local reactions, as well. The San Diego Unified School District announced in late February that it would be purchasing nearly 20,000 tablets for fifth- and eighth-graders and for selected high school classes later in the spring. Teachers in the district were already talking about the interactive textbooks they planned to create.”¹⁸

The McAllen (Texas) Independent School District has even more ambitious plans to purchase, by early 2013, either tablets or other hand-held devices for all 25,000 of its students, 70 percent of whom are considered economically disadvantaged; the program might be the largest in the country. They won’t contain textbooks right away, but that’s definitely in the offing.¹⁹

Not everyone is convinced the moment for e-textbooks has arrived—and their hunch was backed up by surveys of college students by the National Association

“Education is not the type of activity you want directed by a popularity contest.”

of College Stores and Student Public Interest Research Groups, which have shown that about three-quarters of students would rather use paper-based textbooks.²⁰

At the same press conference where Apple unveiled iBooks, the company also gave reporters and educators a look at iBooks Author, a new application in which one can create and publish an e-book complete with many of the same elements found in iBooks textbooks—text, photos, video, interactive diagrams, three-dimensional objects and more. One can drag and drop text from Microsoft Word, which automatically flows around any images or other elements on the page.²¹

The iBooks product and iBooks Author application generated mixed reaction from technology critics and education observers. “A new style iBook is more like interactive television. There are bits you read, bits you listen to, bits you watch, and bits that you play with,” wrote Andy Ihnatko in the *Chicago Sun-Times*. “It’s a very big deal and major textbook publishers have already jumped on board. ... Schools will be able to purchase in bulk and issue redemption codes to students.”²²

Ihnatko test-drove the iBooks Author app and declared it worthwhile if you’re producing a textbook but clunkier if you’re “hoping to use it to convert your 140,000-word novel from a Microsoft Word file.” He added, “None of the iBook Author’s built-in book templates are optimized for such simple books.”

And Ihnatko expressed the concern that Apple’s terms and conditions allow books created with the app to be distributed only on iTunes—and only if Apple approves them.²³

A columnist for the “Armchair Geek” page in *Wired* magazine fears that iBooks will help generate a

great leap forward in the quantity of content while neglecting what he said online researchers and readers need the most: content curation.

“Education has enough content. There is more generic content out there for any individual subject than is possible to know,” writes Daniel Donahoo. “What educators and parents alike are asking is, ‘Where do I find the best quality content?’ Yet, instead of helping to create tools that allow for improved discovery, Apple is only adding to the problem by offering more tools to create and share content.”²⁴

While “crowdsourcing” to find the best content works well when it comes to music, games, videos or other artifacts of pop culture, Donahoo adds, “it does not, however, work well for content that relies on a higher level of understanding or expertise. Areas such as education and health that the whole population is interested in and has an investment in, but which they don’t all have an in-depth knowledge of, require more than just the crowd to make a decision about what constitutes the best quality content and tools. Education is not the type of activity you want directed by a popularity contest.”

He concludes: “Everything about the Web and the internet over the coming years is screaming curation.”²⁵

OUT IN THE CLOUD

The cloud provides a wide range of opportunities such as distance learning, interactive and “many to many” learning, open-source online content that’s freely accessible to all, and a new chance for non-traditional students—those who never received a GED, people with disabilities and those seeking new job skills.

In addition, the ability to access content anytime, anywhere has become more of an expectation in the past two or three years, says Moore of Dell. “There are all sorts of reasons,” for switching to cloud-based architecture, adds Curtis Bonk, education professor at Indiana University and the author of “The World is Open: How Web Technology is Revolutionizing Education.”²⁶

Google’s public cloud seems to be getting particularly heavy use from educators in the Google Docs set of applications, which teachers can use to share assignments or lesson plans. Related apps like Google Talk and Google Sites have drawn some

interest, according to Jaime Casap, senior education manager for Google. “It’s changing the dynamic of the teacher-student relationship,” Casap says. “The teacher used to hand out an assignment and say, ‘Go do it.’ Now teachers are more coaching than judging because the student can collaborate with the teacher.”²⁷

The Berkeley (Calif.) Unified School District uses the free Google Apps for Education tool, says Jay Nitschke, director of technology. This provides for collaborative documents, sites, groups, calendars, video and more, and provides for “super easy integration with phones [and has] no servers to maintain—a big win for the overworked tech team,” Nitschke says.²⁸

THE IMPACT OF INTERACTIVE WHITEBOARDS

Another technological tool that’s been installed in more and more classrooms is the interactive whiteboard—a large, computerized screen that allows Internet access, video and audio presentations, digital assessments using remote clickers, and the ability to record lessons and play them later.

Proponents say interactive whiteboards keep education on pace with the digital age, while detractors say they’re too expensive and don’t represent that large of an advance over the low-tech blackboard unless teachers get very sophisticated about how to use them.

Research conducted by Robert Marzano of the Englewood, Colo.-based Marzano Research Laboratory found that among students in 200 classes, those in classes that used the devices did significantly better than those who did not, thanks to increased student motivation and participation.²⁹

Some believe that with the advent of iPads and other tablet devices that allow a more one-to-one experience, the use of interactive whiteboards might have peaked. “It’s hard to say,” Mike Lawrence, the executive director of Computer-Using Educators, told *Education Week*. “Most of the tech-savvy educators I’ve been talking to are looking at solutions other than interactive whiteboards.”

But whiteboard manufacturers say they’re well aware of the need to reinvent their products to keep up with tablets, smart phones and other personal technologies. “The interactive whiteboard is part of that ecosystem,” says Bob Crain, general manager at Suwanee, Ga.-based whiteboard maker PolyVision. “Like any other ecosystem, if you pull out a key element, the rest of the ecosystem starts collapsing on itself.”³⁰

“Creating that winning pipeline of products is always challenging,” says Nancy Knowlton, president and CEO at SMART Technologies, based in Calgary, Alberta. “If you think what you’ve got today is good enough for tomorrow, I think that’s a prescription for a slow and painful death.”

While hard numbers are tough to pin down, *Education Week* cites one survey of 1,400 full-time teachers in the United States that found 59 percent of respondents said their schools had interactive whiteboards available, while 36 percent had them in their classroom. Government funding has made their use in the United Kingdom even more prevalent. Top brands include SMART Technologies, Promethean, eInstruction, PolyVision and Mimio Interactive, *Education Week* says.³¹



Students in the Alvarado (Texas) Independent School District build their own online portfolios and save tons of other data that would have been housed on servers or school-based machines, says Kyle Berger, executive director of technology services, which has worked with Hewlett Packard to bring this about. “In the past, we had a lot of computer labs for students. They’ve started to disappear,” he says.³²

The cloud does have its limits, educators say. Memory-intensive functions like science experiments, music composition and video editing probably still need on-site power. Hall County Public Schools keeps career technology classes like architecture and engineering down on the ground. Alvarado ISD does the same with video editing and computer-aided design. “We keep those workhorses on the machines themselves,” Berger says.³³

Others cite challenges like securing data in the cloud, managing the plethora of instructional software used in schools, gaining adequate IT support once school districts’ inventory mushrooms to hundreds of devices per IT person, convincing district leaders they need to take a strategic approach to cloud computing, and securing reasonably priced bandwidth to make the cloud easily accessible.

“School districts need to be putting out guidelines for their staff on how to use these tools in a way that promotes 21st century learning but in a safe way,” says Lynn McNally, a board member of Consortium for School Networking, a K-12 technology leadership organization. “I think there’s a void there.”³⁴

John Kuglin, chief information officer for the Eagle County School District in Vail, Colo., sees three reasons for districts to use the cloud—cost, scale and support. “Budget is going to drive a lot of this, and capability and security also will drive it,” he says. “They can’t do 21st century learning without these types of tools.”

Kuglin underscores the importance of strategic planning in implementing the cloud. “They should have their administration and instructional people in the room and IT people in the room, and they need to sit down and discuss where the district is going in six months, 12 months, 18 months, five years, and discuss the instructional and IT worlds, which have to come together and support each other,” he says. “They should sit down and revisit this and not think of it as a tech plan but as a learning plan.”³⁵

When it comes to technologies like Skype, eBooks and Google Docs—most educators would have had no idea what any of these names meant when they started their careers. Some are still playing catch-up to figure out what these tools are, how to use them and how they can be helpful and innovative in the classroom.

But an increasing number of teachers and administrators, schools and districts are moving forward to implement these 21st century tools, which are proving new methods to bring about the old but timeless goal of producing well-educated young people who are ready to face the challenges that await their generation with the opportunities provided to it.

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