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Digital textbook reflections

Three districts detail their shift from print to digital

By Mary Axelson

It has been nearly three years since the Federal Communications Commission and Education Secretary Arne Duncan rolled out the Digital Textbook Playbook and challenged schools to go digital within five years. It's safe to say schools are not there yet. While going digital looks certain, arrival in two years looks doubtful.

The potential benefits for schools transitioning to digital curriculum—specifically, replacing their print textbooks with digital ones—remain compelling. As schools move to the



Discovery's digital Techbooks work on a range of devices.

Common Core, and Pluto shifts in and out of planetary status, information can be updated on the fly. Interactive quizzes, comments, and dis-

Textbook, page 10

Engaging parents with technology

By Bridget McCrea

Six years ago most of Maine Township High School District 207's parent communication efforts were one-way in nature. According to Hank Thiele, assistant superintendent of technology and learning, parent newsletters, email blasts, and website announcement were the communication



Parents, page 8

5 predictions for 2015

By Stephen Noonoo
Editor, @stephenoonoo

Last year, in addition to the tremendous attention on Common Core's ups and downs, educators also found time to weigh the merits of greater access to broadband in (and out of) the classroom, as well as gaming and learning, the use of Google tools, and the power of data to make decisions. The changes—both political and technological—had a great impact on

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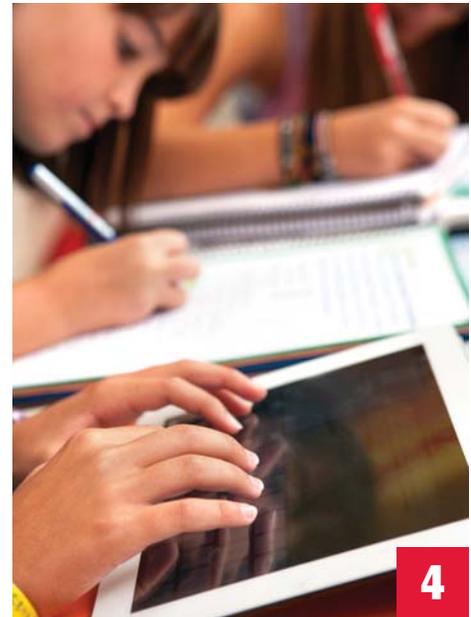
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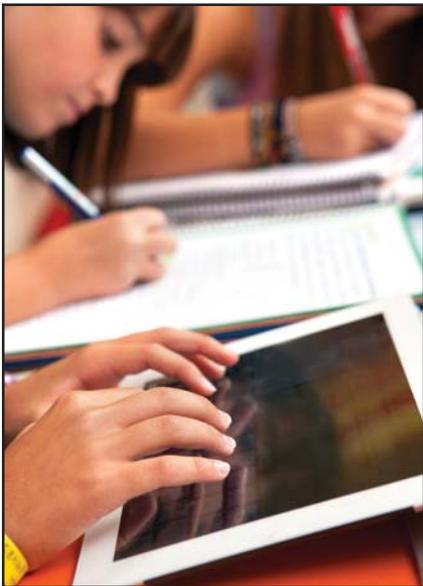
10 soon-to-be-huge trends in ed tech

Researchers say these 10 pedagogical innovations have massive potential

By Meris Stansbury
Editor, @eSN_Meris

You know by now about Flipped Learning, but what about Massive Open Social Learning? Threshold Concepts? Bricolage?

According to education technology experts at the Open University, a distance learning and research university founded by Royal Charter in the United Kingdom, there are 10 innovations



The trends on the list combine both technology and pedagogy

already in currency across the pond today; they just haven't had a profound influence . . . yet.

But that's what 2015 is for.

Specifically, the report emphasizes that education can be dramatically enhanced by social networks. The so-called "network effect" comes from thousands of people learning from each other, but it needs careful management to reach its full potential.

"Social networks have transformed entertainment from delivering books, radio, and television programs into holding a global conversation. The same is about to happen with education through social learning," said Mike

Sharples, professor of Educational Technology at the OU and lead author of the *Innovating Pedagogy* report.

The list of innovations was compiled by a group of academics at the Institute of Educational Technology in the OU after proposing a long list of new educational terms, theories, and practices. The group then pared these down to 10 that have the potential to provoke major shifts in educational practice.

1. Massive Open Social Learning: Aiming to explore the network effect, thousands of people interact online in productive discussions and the creation of shared projects to share experiences and build on knowledge.

2. Learning design informed by analytics: Used in the development of courses or series of lessons to help educators plan a coherent sequence of media, tech, and pedagogies, the use of learning design tools shifts attention away from content toward the learners' needs. According to the report, data from tracking and management of learning activities can inform learning design by providing "evidence to support the choice of media and sequence of activities. When analysis of learning data is also used to evaluate and improve learning design, the circle is complete."

3. Flipped classroom: Reverses the traditional classroom approach to teaching and learning by moving direct instruction into the learner's own space through video lectures. This allows time in class to be spent on activities that exercise critical thinking and conversation.

4. BYOD: Bring Your Own Device allows "teachers to become managers of technology-enabled networked learners, rather than providers of resources and knowledge," says the report. This approach also has the potential to "reduce cost of IT provisions," but schools must have the infrastructure and bandwidth capabilities.

5. Learning to learn: Central to this process is what the report says is "dou-

ble-loop learning," or working out how to solve a problem and reach a goal, but also reflect on that process as a whole, questioning assumptions and considering how to become more effective. "This helps them to become self-determined learners with the ability to seek out sources of knowledge and make use of online networks for advice and support," explains the report.

6. Dynamic assessment: This focuses on the progress of the student, with the assessor interacting with students during the testing phase of the process and identifying ways to overcome each individual's learning difficulties—assessment and intervention are inseparable.

7. Event-based learning: Running over a few hours or days, this type of learning creates "a memorable sense of occasion," notes the report. Examples include maker fairs of do-it-yourself STEM projects and crafts.

8. Learning through storytelling: Developing a narrative is part of a process of meaning-making in which the narrator structures a series of events from a particular point of view in order to create a meaningful whole—a structure that helps learners to embed and revisit their learning. Examples include writing up an experiment or analyzing a period of history.

9. Threshold concepts: "Something that, when learned, opens up a new way of thinking about a problem or a subject of the world," explains the report. One example includes the physics concept of heat transfer that can inform everyday activities such as cooking or home energy use.

10. Bricolage: A practical process of learning through tinkering with materials, it involves continual transformation. The report states that this is a basis for creative innovation, "allowing inventors to combine and adapt tools and theories to generate new insights, while also engaging with relevant communities to ensure that the innovation works in practice and in context." 

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What great teachers do with technology

Too often, we see teachers putting the proverbial cart before the horse. They find an app or tool they like, so they introduce it in their classroom. The students might find it cool and engaging—but if the teacher hasn't defined why they're using that tool, its integration has no clear educational purpose.



Tom Daccord

If, instead, you begin with a learning goal in mind and choose apps and devise activities in support of it, then you're on a path to meaningful technology integration.

To help educators develop a vision for using technology in their classrooms, here are a few examples of what great teachers do with these tools.

Empower students through creativity

Shawn McCusker has been teaching high school social studies for nearly two decades. For years, he would have his students demonstrate their understanding of the great industrial philosophers by writing a comparative essay.

Two years ago, Shawn was involved in an iPad pilot program, and he gave his students a choice in how they would demonstrate their knowledge: Students could write an essay or they could tap the creative potential that existed in their iPads.

One of his students created a 12-minute video tutorial comparing the views of Adam Smith and Karl Marx. Now, this was a particularly shy student, as Shawn recounts—and when students were demonstrating their projects and her video was about to play in front of the class, she conveniently went to the bathroom. She returned to a round of applause.

Shawn has a YouTube channel, and he likes to provide his students with an option to publish to an authentic audience. When Shawn's student opted to

post this particular video on YouTube, it garnered several hits. The student was so excited that she asked her teacher, "Can I work on this project some more? I'd like to improve my video." (How many students typically ask, "Can I write another essay?")

This student's goal was to be the most popular resource on Adam Smith and Karl Marx on the web. And if you Google these industrial philosophers, you'll find her video shows up in the top three search results—besting Wikipedia and the Library of Congress, among other sources.

Can you imagine the pride and motivation she feels in having this audience? Here, we have a student who's so engaged in the process that she actually

and their community. So far, there are a total of three books published in the iTunes Store.

By creating these global books, Kristen wants to demonstrate how classrooms around the world can come together to publish something unique and creative and learn from each other at the same time. One fascinating aspect of the project is that it has redefined the teaching of geography. As students hear from their peers in other parts of the world, they start to ask questions, like: Where's Russia? Where's Mexico? How do those countries compare to mine?

What was often a passive, teacher-centric process in which students memorize places and rote facts has been transformed into an inquiry-based process, where the students are asking the questions and driving the geographical exploration. Now, students want to

If you begin with a learning goal in mind and choose apps and devise activities in support of it, then you're on a path to meaningful technology integration.

asks her teacher if she could work longer on her project. Here is a shy student whose voice isn't always heard in the classroom, and yet she is able to shine by unleashing her creativity.

Connect learners

Great teachers not only empower their students through creativity; they also connect their students to other audiences, giving their students a platform for putting their knowledge to use in a way that helps others.

Kristen Paino is a New York teacher who has helped develop a Global Book Series that includes books authored by educators and students from around the world. Kristen solicits participants via Twitter and using the BookCreator app, they compile two-page creations in which students describe their school

look at a map; they want to learn more about these places.

In these classes, students are not going to forget the projects. That Adam Smith/Karl Marx video is going to stay with Shawn's former student for a long time—not just the process she undertook, but also the content behind it.

As Shawn would agree, his former student knows the works of these philosophers inside and out. The video is simply a manifestation of her knowledge, made possible with the help of technology; it's actually the hours she has spent reading their works, analyzing their arguments, and outlining her project that are the foundation of her knowledge. 

Tom Daccord is the director of EdTechTeacher (<http://edtechteacher.org>), a professional learning organization.



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Parents

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mainstays for the 7,000-student district in Park Ridge, Ill.

But in the past few years, Thiele's department began to integrate more interactive, technology-based options into the mix—one that would keep parents up-to-date on what their kids were up to, and give them a chance to respond. "We really want to foster two-way communication with our families," Thiele says.

At the core of Maine Township High Schools' parental engagement approach is an Aspen Student Information System (SIS) populated with information like student tardies, absences, grades, and report cards. If, for example, a student's grade falls below a certain pre-determined threshold, parents are alerted to the issue and asked to contact their pupil's teacher. "We kick messages out to families through the SIS," says Thiele, "and encourage them to contact us about inaccuracies."

The district has also integrated a SchoolMessenger auto-dialer with its SIS—a move that Thiele says resulted in even more real-time communication with families. The system was then paired with numerous Google for Education tools that teachers use to send email and other types of messaging out to parents. "The data integration piece generates the messages that are then sent out to the families," says Thiele, "making the messaging even more personalized and invoking responses on the families' parts."

Switching up the system

Internally, Thiele says, the district's IT department has also made some changes that have streamlined the way teachers, students, parents, and administrators interact. For example, there was a time when student discipline incidences were recorded 15 different ways across three different high schools, he says. "Having a machine try to interpret all of that data was impossible," Thiele points out. To solve the problem and create a more cohesive approach to the data, he says, the district reviewed and redrew its discipline codes and its atten-

dance reports in a way that allows the SIS to analyze it and generate communications based on specific triggers.

One particularly important change involved open text fields—a variable that can become unwieldy when users are left unlimited space in which to provide comments. "In some cases, we've had to limit the options in a way that allows us to gather data in a consistent format," Thiele explains, "and the computers to make sense of that data for us."

In 2014, the district added a new interface that allows parents to access the SIS and update key pieces of contact information (phone numbers, email addresses, etc.) without having to call the school's office or visit the institution in person. More recently, the schools began collecting the mobile phone numbers of parents who would rather receive text messages versus emails or phone calls.

In return for these efforts, Thiele says Maine Township High Schools' parents receive pertinent information in real time, "rather than getting it every four or eight weeks." Going forward, he says the district will continue to hone its approach to parental engagement and create an even more interactive, real-time environment for such communication. "We're putting the task into the hands of the parents and students," says Thiele, who sees this hands-off tactic a positive move for schools, "with the goal of getting to the point where no one has to look at the data to make it useful and relevant."

Raising the bar

Intent on gaining a better understanding of its constituents and communicating with them, Bethlehem Central School District of Delmar, N.Y., has adopted a multi-pronged slant to parental engagement. According to Sal D'Angelo, chief technology and information officer for the 5,000-student district, the approach includes a website that's regularly updated with pertinent information, a social media presence on Twitter and Facebook, and an Aspen SIS that includes a parent portal. Through this multifaceted solution, the district has been able to stoke a "meaningful exchange of information regard-



Parents receive information in real time, fostering better communication.

ing student grades, discipline, and attendance," says D'Angelo.

"Roughly 90 to 95 percent of the information we distribute as a school district goes through our parent portal," says D'Angelo, "whether that's grades, report cards, assessment reports, or anything else that needs to be communicated with families." When parents log onto the portal, they can access the information across multiple students, drill down to one single student, and then view the related teacher pages and other information. "Parents come right into their student's world," he says, noting the direct correlation between ease of use and utilization. "In a world where people have a variety of technical competencies, we really need to provide parents with easy-to-use, reliable communication options."

To other districts looking to improve their own approaches to parental engagement, D'Angelo says, a good first step is to survey parents on how they want to be communicated with. Then, look at how other schools and districts are successfully tackling the challenge and explore the current tech tools that are on the market. "Navigate the options and narrow them down to the tools that will work most effectively in your own environment," says D'Angelo "all while focusing on reliability, simplicity, and ease of use." 

Bridget McCrea is a contributing writer for eSchool News.

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Textbook

continued from page 1

cussions live within the text itself. The addition of video, audio, and interactivity allows for multi-modal, personalized, accessible, and interactive learning; it's lightweight for backpacks; and there are cost savings down the road from not printing.

Of course, widespread adoption relies on a robust infrastructure. Wireless bandwidth must be able to handle the load, and filtering must let advanced material through. Students need reliable devices at school and home, and the content needs to be designed for whatever platform they might have. Importantly, teachers need time to learn a new way of running a classroom.

Here, three early adopters of digital textbooks share their experiences, from conveniences and triumphs to pitfalls and setbacks. Their stories provide a glimpse into the present, still-evolving world of digital textbooks and hint on where it may be headed.

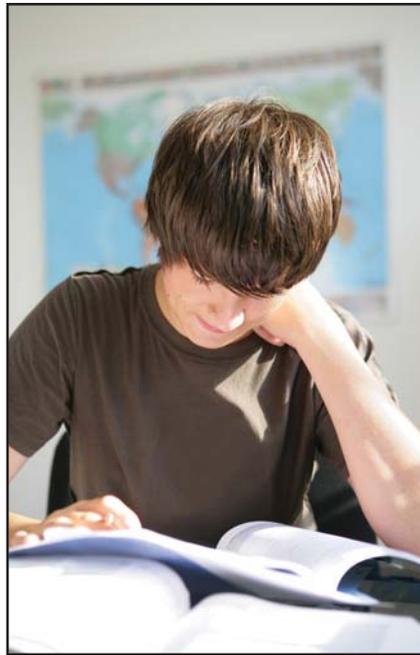
The Fairfax Learning Curve

Virginia's Fairfax County Public Schools, with 12,000 students per grade level, is a digital textbook pioneer. Craig Herring, the director of PreK-12 curriculum and instruction, explains that they started using some Pearson online textbooks in 2009, back when they were almost PDF versions of the print. The next year, they flipped that model by buying online social studies books with some print backups. Those online textbooks included some new features, and they rolled that out to all grades, 7-12, in 2011.

There were "hiccups," Herring says, but nothing like what happened when they abruptly shifted to the new math books, which relied on an internet connection to the district's website, which ended up overloading their servers.

"I don't know that anybody anticipated how much traffic our division would bring to the site," explains Rose Moore, mathematics coordinator for the district.

Three years later, Fairfax now has sufficient infrastructure to support the load, as well as a help desk maintained by Pearson. Importantly, help is available when kids start homework late at night. But the district continues to search for a way to relieve teachers of the cumbersome task of giving each student access to their online accounts, since they have



Can digital replace print yet?

not yet found a way to seamlessly integrate the process with their Student Information System.

The district uses a bring your own device approach to grant students access, and supplements that by letting kids check out devices and hotspot cards for Wi-Fi access. They work diligently to ensure access in high poverty schools. One school, upon device checkout, supplies maps and tours of free, neighborhood Wi-Fi spots such as the library, McDonalds, and Starbucks. Even so, home access is not guaranteed. Herring tells that their advance survey asked if the family had a computer at home, but a "yes" failed to account for multiple kids needing access to multiple textbooks. "Generally, the older kid would win out," says Herring. "The middle school student wouldn't be able to get on to do their math homework

because it was being used by the senior studying for AP."

Generally, Herring advises districts look into short-term contracts of no more than two to three years. New options are on the market from their publisher, but Fairfax remains locked in to a six-year contract with an old version. The district has also discovered the importance of defining technical standards for contracts.

"Everything is changing so quickly," says Herring. "I'm not sure the future is these big basal textbooks. We develop a lot of curriculum ourselves . . . and we like pulling from other places." As he watched teachers, he realized "They'd rather pick and choose." Herring also advises giving teachers substantial time to learn the features and resources of a new, digital platform before sharing it with students.

Copious Copia

Copia is among the companies responding to a mashable culture. The company offers schools and colleges the ability to choose bits and pieces from a wide array of partners, including Macmillan, McGraw Hill, Houghton Mifflin, Pearson, Random House, and Simon and Schuster. They offer textbook publishers a platform with instant interoperability and digital features such as the ability for teachers to embed in-class discussions, quizzes, and activities within the text and to track student usage and achievement.

Cross-platform reliability is a work in progress. In an attempt to avoid the technical glitches that come with digital materials, some districts have insisted that all digital content be compliant with the interoperability standards of the IMS Global Learning Consortium. Copia aims to be IMS compliant by the beginning of the next school year.

Advanced Placement courses are the focus of a small, new Copia/iPad pilot at Islip High School in New York. Wayne Mennecke has brought the Copia/iPad pilot to two sections of AP Biology and one section of Biochemistry. Explains Mennecke, "I

view their use right now as I would lab equipment. Not every lesson calls for every piece of lab equipment, but when the opportunity is right, students can and should take advantage of the tablets as a resource.” Mennecke has used some apps that deal with the concepts of mitosis and cell division, and his students are reading selections from *The Immortal Life of Henrietta Lacks* and *The Sports Gene*.

Rahana Schmalacker has used Copia for poems and short stories with her AP literature students. They will soon begin their first digital novel, the classic warning of mechanization, *Frankenstein*. She was surprised to find that students do not find the technology or content particularly exciting. “Some are more comfortable with paper,” she explains. But students like clicking for definitions, and Schmalacker likes the ability to guide reading with embedded questions. The devices don’t go home with the students, and both teachers say that this limits their value.

Copia began with a significant Australian project, LearningField, and its U.S. projects are growing larger very soon. According to a November memo from the state superintendent of public instruction, Virginia will pilot a statewide digital textbook marketplace, where districts can purchase approved digital textbooks and other learning resources. They are starting by inviting foreign language teachers (which will have textbooks with sound) and AP classes to volunteer for using the marketplace’s portal, developed by Copia. Fairfax does not yet know how this will impact its use of digital textbooks.

Three Years of Discovery

Rock Hill Schools in South Carolina ran its first pilot of the Discovery Education Science Techbook in grades K-5 during the 2012-2013 school year using the district’s iRock program to provide in-school iPads (families can take out an insurance policy to bring them home). The district expanded to Discovery Education’s *Social Studies Techbook* in all middle school class-

rooms in 2013 and recently added math.

Gail Steffensen, who teaches fourth grade at Mount Holly Elementary in Rock Hill Schools, is in her third year of using the techbook. The curricular abundance, which includes experiments and games, allows her to let advanced students work on something additional, and she uses those resources to fill in background information for other students. Like Schmalacker, she is a fan of the quick access to definitions for vocabulary, and she has found that audio paired with text can boost comprehension and skills for new readers.

And her students, she says, are also notably more engaged with iPads than worksheets, a bit of anecdotal evidence that seems to support a recent study by Merola Research conducted at the district, which found that 21 percent of fourth-grade students using the Science *Techbook* scored at or above the exemplary level on the state’s Science PASS exam, compared to only 15 percent of students who weren’t using it.

Rock Hill elementary schools do not yet have a comprehensive set of digital resources for social studies, so Steffensen recently spent many hours vetting 20 videos for a unit on the trade triangle of slavery. In the future, she would like access to a comprehensive curriculum in all subjects that would gather grade-appropriate videos, photos, and documents, but, she adds, she would continue to watch, read, and listen to anything before bringing it into her classroom.

Of course, “There are times when something crashes and it doesn’t work,” she says, but adds that she’s not solely reliant on the digital books for her lessons. “Teachers always have to have a backup plan.” **ESN**

Mary Axelson is a contributing writer to eSchool News.

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6 Minecraft lesson ideas for your Common Core math class

From graphing paper to algebra puzzles, practical lesson ideas for turning math class into Mathcraft

By Jim Pike

Last year I taught third-grade math in a whole new way. Combining elements from the wildly popular sandbox game Minecraft, I had students thinking visually and creatively about mathematical models and theories that went way beyond a typical third-grade curriculum, transforming math class into what I like to call Mathcraft.

Why Minecraft? I could say I am using Minecraft for a number of reasons, like how I find Minecraft

whelming and when the lesson became the engagement, their attention, confidence, and motivation soared. Here are six great ways to use it in your math classroom.

1. Let students create their world.

If you have an aggressive Minecraft class, you can put them in a single world and either let them all build it by themselves, or allow all the students to build a world together. Personally, I just open up a world in MinecraftEDU

great conceptual knowledge, but they're just a nightmare to use—to get them to fit in and take out, and with the kids always messing up each other's blocks. But with Minecraft, the blocks are digital so the kids can't mess each other up, if you know how to manage them, and the bonus is that the students are incredibly engaged. Then you can throw in the fun part. You can let them PvP (fight) and chase each other in their world. The structures they've just made make a lot of fun things to hide behind, like funky-looking trees based on prime factorization or stacks of blocks in patterns that represent long division. It's kind of a conceptual math world.

3. You can use Minecraft, even without access to computers.

We were only able to play Minecraft in the computer lab twice a week but that was perfect because I just ran math class using Minecraft as the lesson on those days. On other days, we'd be doing similar things. The kids would have graphing paper and would make their models with colored pencils and crayons, and we would play math. I was really trying to teach them how to read and write algebra and to look at math as a different language.

4. Minecraft is just one creative tool in the toolbox.

In my third-grade class, we did a lot of tracking and graphing slopes, and I turned it into a maker activity as well. We learned how to read rise over run, and how to build a slope in Minecraft. Then we chopped up a bunch of different cardboard boxes and made racecar ramps at different slopes around the classroom, and ran averages on how far the racecar would travel with each slope—and this was a third-grade classroom.



Minecraft worlds allow for both collaboration and solo exploration.

enhances metacognition by increasing students' memory storage capacity. The game itself creates a relatable enjoyable experience that can be internalized and shared in a community of learners. The limitations on the working memory are minimized because the gameplay itself is an extension of our visual sketchpad. Working with students, they always say, "I can see it," and when they see it, they share it.

However, the real reason I use Minecraft is that the students chose it. The popularity of the game is so over-

(which makes it easier for the teacher since you can do things like freeze the students and transport). I don't use worlds that have already been created, opting instead to let the kids build their own. I use MinecraftEDU as my server runner and open up the superflat world. We start building and we end up with a crazy math city.

2. Create your own visual, conceptual math world.

I've tried to use base 10 blocks before, because they've got a lot of

5. Let the dog drive—at least sometimes.

One way to get started is just to try a whole class lesson and to see how the kids respond to it. And be prepared to let the dog drive at times—meaning when the class is playing the game, let them take control and just play. Give them their time but take yours as well. If you need a jumping-off point to get started, look for Minecraft lessons online, or see mine on the website Educade. The Parthenon lesson I created is one example. It turns algebra into a puzzle, and it gives students simple instructions on how to build something cool. (There's also a video that explains why the formulas actually work).

6. Use Minecraft to help change your classroom culture into something students love.

By far the greatest effect Minecraft has had on my students was a change in the classroom culture and attitudes

If you have an aggressive Minecraft class, you can put them in a single world and either let them all build it by themselves, or allow all the students to build a world together.

about education. When we were preparing for our benchmark test, I gave them 10 Common Core word problems for homework. When I put them on our Edmodo page, they got mad at me. Mathcraft—at least the way I use it in the classroom—is not all in a video game. There is a lot of reading and writing of algebra and word problems. Before, they used to complain and give

up when they had to do similar problems out of textbook. But now my kids turned even that part of the curriculum into a game and cannot put down the pencil. **eSN**

[Ed. note: For more Minecraft lesson ideas, see Jim Pike's lesson plans on the website Educade.org.]

Jim Pike formerly taught third grade at Ascension Catholic School in Los Angeles. He currently teaches a Mathcraft course at CodeRev Kids Learning Center in Santa Monica, Calif., and is working on bringing Mathcraft professional development to teachers using online Minecraft servers.

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Predictions

continued from page 1

educators everywhere.

Likewise, this year, with the recent expansion of the federal E-rate program and impending switch to online testing, we can certainly expect more of the same. But where else will educators turn their gaze in the coming months? To get a pulse on the current—and future—state of affairs, *eSchool News* recently asked five education technology influencers about their thoughts and predictions for the year ahead, from digital learning broadband, and mobile to innovating in every classroom. Here's what they had to say.

1) Laying the groundwork for learning

Keith Kruger, CEO, Consortium for School Networking



This will be the year of building the capacity for digital learning. That means we need a renewed focus on infrastructure. With the big new E-rate investment in broadband connectivity and Wi-Fi for every classroom, it is time for education technology leaders to focus on designing smart, robust, and scalable education networks. Our focus increasingly must be on ensuring that we have the bandwidth and the network reliability for mission-critical instruction and operations. And it means that mobility will be driving new possibilities. Going forward, we will not be talking just about one-to-one computing, but rather about creating “always on” learning environments where each learner has multiple devices.

Finally—and most importantly—we also know that infrastructure alone will not transform learning. The most critical factor is building the human capacity and creating the culture to leverage these digital opportunities. This will not happen overnight, nor will it happen by simply flipping a switch. But it will happen when leaders set expectations and create a climate for innovation. Let's make 2015 the time to move beyond rhetoric and make digital learning a reality.



2) Data getting smarter

Kristen DiCerbo, principal research scientist for Pearson's Center for Digital Data, Analytics, and Adaptive Learning

While digital innovation has dominated K-12 education throughout the past decade, as we enter 2015 I predict we will start to see a shift in focus to how people and



This year, look for a renewed focus on how to support teachers, as well as practical ways to improve learning for all students.

technology can best combine to positively impact learner outcomes. One area where we are already beginning to see a shift is in regard to the concept of digital learning and personalization. We will see a significant change as personalization will transition from the focus on data and machine choices, toward technology as a decision support for teachers, students, and parents. The technology will recommend, and teachers can digest the suggestions and adjust their instructional models accordingly.

3) More opportunities realized



Cheryl Scott Williams, executive director, Learning First Alliance

In 2015, schools will continue to focus on tools and content that they can use to support both teacher growth and student achievement to the new higher standards (aka Common Core). To the extent handheld devices continue to come down in price, more districts will move into one-to-one computing to capture and keep student attention on learning exploration and to take advantage of the publishing industry's new focus on creation of digital content. More publicly available free content, including primary sources via the Library of Congress, the Archives, the National Park Service, NASA, and other government sources will become central to wise implementation of one-to-one initiatives. And, finally, with the increase in E-rate funding, more schools will be connected to broadband so all this can actually take place.

4) New rules, new growth

John Harrington, CEO, Funds for Learning



The year ahead promises to be an exciting one for schools and libraries who receive E-rate funding support. New rules—and more funding—will help bring faster internet speeds to almost every classroom and library in America. Because of the many changes to the E-rate program, applicants will be faced with new forms, new calculations,

and a host of new reporting requirements—but these changes are designed to deliver an E-rate program that is better tuned to the needs of students and library patrons. We expect to see as much money committed for Wi-fi connections in 2015 as was committed in total in the five years prior. In short, 2015 will be a year of change. Those changes will require learning new rules and new ways of doing things, but in the end we expect to see a more effective E-rate program helping to further the cause of internet access in our country's schools and library buildings.

5) From political to practical

Melinda George, president, National Commission on Teaching and America's Future



We are entering the year of supporting good teaching for deeper learning. The conversation will shift from one that is political in nature to one that is truly about the conditions that need to be in place to support teaching so that all students have the opportunity to learn in a way that prepares them for college and career readiness. NCTAF and its partners will play a pivotal role in sharing case studies and highlighting the “how to” for schools and districts around the country. The key to success will be found through an open and collaborative dialogue. This year, look for a renewed focus on how to support teachers, as well as practical ways to improve learning for all students.

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Preparing for the end of Windows Server 2003

By Phillip Britt

Microsoft is ending its support for Windows Server 2003 on July 14, affecting 24 million systems, according to Microsoft statistics.

Though Microsoft won't divulge the market share that represents, most of those affected servers are expected to be in large and small businesses, with schools making up a smaller percentage.

While the servers themselves will continue to work after the end of support, continuing with these servers is inviting crashes or information compromises, according to technical experts and the U.S. government.

The danger of operating an unsupported server, according to an alert from the U.S. Department of Homeland

Security or Windows Server, according to Ben Dadson, the university's coordinator of desktop and IT services. Those servers still operating 2003 have yet to be upgraded because they are still operating with older versions of SQL that are not supported by Windows Server 2008 or 2012, according to Dadson.

The few servers still running the older version of Microsoft Server are doing so because they have some applications that have yet to be upgraded to be supported by the newer versions, said Dadson, who is notifying vendors to upgrade those applications by March 31, or he will look for alternate solutions.

While he expects most vendors to comply or to find acceptable alternates, Dadson is concerned that one Windows

applications have not been upgraded from the 16-bit architecture of Windows Server 2003 to the 32-bit architecture of Windows Server 2008 and Windows Server 2012.

Other applications were never upgraded because they work, so users saw no previous reason to upgrade, adds David Mayer, practice director for Insight Enterprises Inc., Tempe, Ariz.

Best practices

Dadson, Mayer, and Hertenstein offer the following best practices for upgrading from 2003 to newer versions of Microsoft Server:

- Conduct a full inventory of network resources: Know what servers are where and what operating system(s) they use (a machine running in a virtual environment may run more than one version of Microsoft Server). Know which, and how, servers are interconnected with each other and with other network equipment, as well as the "owner" (i.e., College of Law) of each server.
- Use virtualization during migration, enabling the operation of the older 2003 version until the newer version is up and running and applications are tested.
- Start the implementation early. While the switchover to one of the newer flavors of Windows Server should take only a couple of days, there can be unexpected delays in moving and upgrading applications for the new environment.
- Conduct the migration during a slow time, such as spring break.
- If, as in the possibility of the server running the Indiana of University of Pennsylvania HVAC application, a server can't be upgraded by the deadline, make sure it is prevented from connecting to the internet.

Additionally, Microsoft offers an online planning assistant on its website to help with the migration. 

Phillip Britt is a contributing writer for eSchool News.

While the servers themselves will continue to work after the end of support, continuing with these servers is inviting crashes or information compromises, according to technical experts and the U.S. government.

Security U.S. Computer Emergency Readiness Team (U.S.-CERT) is the risk of viruses and other security threats, which could lead to "loss of confidentiality, integrity, and or availability of data [and] system resources."

While the end of support won't impact education as much as it will the corporate world, there are still some of these older servers in schools; meaning IT managers will have to determine how they will manage the migration to either Windows Server 2008 or Windows Server 2012. Microsoft has yet to announce when its next version of Windows Server will be available.

Indiana University of Pennsylvania, with about 14,000 students across its three campuses, provides an example of some of the issues surrounding the migration of Windows Server 2003.

The university runs about 150 servers, 90 of which run Windows, all but a handful of which run Server 2008

2003 Server, which the university uses to control some heating, ventilation, and air-conditioning systems on university grounds, will not get the needed vendor upgrade and that an appropriate substitute replacement will not be ready by the deadline. If that happens, he plans to firewall the server from the internet, meaning that users will need to connect via a virtual private network until the server upgrade is complete.

Most that are still operating Windows Server 2003 are doing so for the same reason as Dadson—they have applications not supported by the new Windows servers, according to Andrew Hertenstein, manager of the Microsoft Data Center Azure Solution for En Pointe Technologies, Gardena, Calif.

Some of these applications were developed by companies no longer in existence, says Hertenstein, who questions the use of any applications developed by now extinct companies. Other

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Teach your students the right way to Google

In the age of the split-second Google search, it's more critical than ever to train students to distinguish between primary and secondary sources

By Kelly Maher

As in decades past, proper research methods are an essential skill for today's students. At a time when most students (and adults, for that matter) are accustomed to heading straight to Google to answer all of their questions, being able to sagely sift through the good, the bad, and the ugly of search results is key to creating independent 21st-century thinkers.

Do your students know how to find and refine effective search terms? Do they know how to filter results using advanced search options? To that end, Google's Search Education site offers a plethora of beginner, intermediate, and advanced search lesson plans related to picking the right terms, understanding results, narrowing a search, searching for evidence for research tasks, and evaluating the credibility of sources.

In addition to the Search Education Lessons, Google also offers a free Massive Open Online Course (MOOC) titled: "Power Searching with Google." (The course is taught by Dan Russell, a senior research scientist at Google, who is also the man behind SearchResearch, a blog about all things search and research). If you have limited time, you may find the Power Searching Quick Reference useful, and the explainer video emporium Common Craft also offers a short video on web search strategies, which students might find easy to digest.

Afterward, test your student's search skills (or your own) with a Google a Day, a web puzzle that poses a question answerable via some targeted Googling. The terms and keywords are up to you, but, as the site notes, there's only one right answer. If you don't find these challenges difficult enough, try Google's Advanced Power Searching Course, where you will find complex search challenges and solve them along with others from around the globe.

("You are in the city that is home to the House of Light and a museum in a converted school featuring paintings from the far-away Forest of Honey," challenges one riddle in the course. "What traditional festival might you be visiting?")

Who told you that?

Once students have found what they are looking for, the next step is to eval-



GIL C / SHUTTERSTOCK.COM

Google has made a number of resources available to teach advanced search techniques.

uate the source. Is the information accurate and reliable? Is it current? Are there biases? For a short primer to the topic, watch Common Craft's explainer video, "Website Evaluation." You can also show students classic hoax web sites like the Pacific Northwest Tree Octopus and Dihydrogen Monoxide, which illustrate beautifully that not everything on the internet is true. Another favorite for driving this point home is State Farm's humorous French Model commercial.

Alan November and Brian Mull take an interesting approach to assessing the reliability of online sources in their article "Web Literacy Where the Common Core Meets Common Sense." To get students thinking beyond the surface of what they read, the authors suggest teachers have their students use Google to search for images of "ear mouse,"

and then read two articles about this rodent.

The first article, "Artificial liver 'could be grown,'" comes from the BBC, a trusted news source. The second account, "Vacanti mouse," appeared on Wikipedia. The inconsistencies within the articles are readily identifiable. November and Mull challenge students and teachers to determine which information is more accurate by finding a third reliable source. But where? Astute readers of the first two sources, they say, will notice that the original research was done in labs at the University of Massachusetts and Massachusetts Institute of Technology. Then, using advanced search commands on Google, they can narrow their search and gain insights direct from the researchers themselves.

Spoiler alert, with further research students will find that the ear was not actually a human ear that was grown on the back of the mouse, as the BBC originally reported, but was instead ear shaped cartilage (derived from a cow) that was implanted on the mouse's back. Students will come away from the exercise able to discern the difference between primary sources, in this case the labs where the research was completed, and secondary sources, like news sites. A valuable lesson, no doubt, and believe it or not, all it takes is a little Googling. **eSN**

Kelly Maher is a mathematics and technology teacher and technology coordinator at Patrick F. Taylor Science and Technology Academy, near New Orleans.

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E-rate Action: A Triumph for Learning

Following years of underinvestment in our schools' technology infrastructure, the Federal Communications Commission took bold action on December 11 and made a big down payment on ensuring that our children will have access to digital learning. The \$1.5 billion—yes, I said billion—annual



Keith Krueger

boost to the federal E-rate program is a 60 percent increase in the largest funding source for education technology.

This early Christmas gift to the nation is a giant leap forward for America's students. Under FCC Chairman Tom Wheeler's leadership, and with the unwavering support of Commissioners Jessica Rosenworcel and Mignon Clyburn, our school systems will now have the funding to create robust broadband networks and Wi-Fi access.

This type of historic moment only comes about a few times in our lives. One such moment was in 1996 when the E-rate was passed by Congress with bipartisan support and signed into law by President Bill Clinton. During the last 17 years, that forward-looking action brought basic connectivity to our classrooms.

Yet that basic connectivity was not enough. Too many of America's classrooms do not have the needed technology infrastructure and digital tools that prepare students for college, career, and life. Students must meet increasingly challenging academic standards, yet many classrooms are void of the powerful digital tools that can help our students succeed.

This fall the Consortium for School Networking conducted the second annual E-rate and Infrastructure survey, in partnership with the American Association of School Administrators, which confirmed our fears. The results revealed critical broadband and technology infrastructure shortfalls in

America's education networks. The survey identified affordability and adequate funding as the most significant barriers to reaching the national education connectivity goals.

So the FCC's action is a true triumph for learning. Their decision will help schools leverage the digital

world we live in and to prepare our students for tomorrow. The increase in E-rate funding will serve as a catalyst for personalizing learning, expanding blended and online learning opportunities, as well as provide access to rich, interactive digital resources and tools.

Even better, this action will cost consumers only 16 cents more per

month on their telephone bills on an annual basis that is less than the cost of a latte. This is the kind of investment hopefully all of us can support.

behalf of our children. We must continue this momentum into the New Year and beyond. Members of the 114th Congress, as well as state and local leaders, must make similar investments that prepare educators and students to use broadband connectivity for transformative, connected learning. Infrastructure alone will not transform learning.

One measure the new Congress will be considering is updating and funding the Enhancing Education Through Technology program in the reauthorization of the Elementary and Secondary Education Act. The EETT program would be a powerful complement to the newly strengthened E-rate and provide educators with the resources to leverage technology in the classroom.

The increase in E-rate funding will serve as a catalyst for personalizing learning, expanding blended and online learning opportunities, as well as provide access to rich, interactive digital resources and tools.

month on their telephone bills on an annual basis that is less than the cost of a latte. This is the kind of investment hopefully all of us can support.

In addition to dramatically expanding Wi-Fi connections, developing more robust communications networks, and significantly increasing broadband speeds, the FCC also established greater pricing transparency to ensure that we are getting the most bang for our limited bucks. The FCC also set as a priority providing support and greater assistance to rural America, incentivized matched funding from states, and redefined "rural" to better allocate resources to less populated—and typically under-served—school systems.

Amplified by President Barack Obama's bold ConnectEd vision, the FCC deserves the nation's thanks on

The E-rate cap increase is an investment in our future—just like our nation's earlier investments in creating the highway system in the 1950s or the G.I. bill after WWII. With this action, the E-rate is now the nation's third largest education program.

This moment of celebration should bring a sense of optimism that our nation's leaders can act when it matters most. It refutes the all-too-common narrative of cynicism and inaction inside the nation's capital and puts students on a fast broadband path for college and career readiness. 

Keith Krueger is CEO of the Consortium for School Networking. Learn more about CoSN's superintendent efforts at www.cosn.org/superintendents.

10 ways to revolutionize PD for the digital age

By Jen Sieracki and
Raymond Giovanelli

Over the past 6-8 years, we have seen a supersonic advancement in public schools and the way our teachers now must teach. This has hit education like a tidal wave, leaving precious little time for our teachers to process it, and especially to learn how to do it well.

The consequence, in many schools, is that teachers have begun to use technology but have forced it into all the wrong places and for all the wrong reasons. Research has consistently shown that technology used in inappropriate ways is actually worse for learning, and this is happening all around us.

At Grand Oak Elementary School in Huntersville, N.C. we have worked hard to create an environment where we are supporting our staff through this transition. We are only in our second year of existence and yet we have set the stage through our vision to become a school where teachers and students “Collaborate. Innovate. Achieve.” We aim to help teachers understand our goals for educating students while providing them with the tools, resources, and support culture to make those goals reality. In many ways, the focus on differentiation, risk-taking, and learn-by-doing activities we’re introducing to our teachers mirrors what we are asking from our students as well.

Most teachers were used to the “sit and get” approach to professional development that allowed them to be passive consumers of information. This new way of teaching and learning allows them to take command of their learning and professional growth through topics they choose instead.

1. Technology Tuesdays. These are volunteer sessions for additional technology tool support. This is an opportunity for teachers to get additional tech support on new tools that can be integrated into the classroom. This is done each month by school or district experts.

2. Flipped PD. Rethink professional development and begin to differentiate

by allowing teachers to pick areas they want to learn about, create collaborative action plans, and then learn about their focus area. Simulate an EdCamp model, focus on more engaging and longer term PD that is more in depth rather than isolated shorter sessions.

3. Model and Celebrate. Model technology use with staff any chance you can (in professional development, staff meetings, student groups, model lessons, etc.). Make sure that facilitators and administrators are using different tools as they present to show teachers how they work “in action.” Celebrate the risk-takers on your staff!

4. Be Flexible. Allow flexibility with

“The focus on differentiation, risk-taking, and learn-by-doing activities we’re introducing to our teachers mirrors what we are asking from our students as well.”

what is used by both teachers and students. Don’t focus on one platform or one app. Teachers should be able to use what they are comfortable with and what works for their kids.

5. Tap into Student Resources. Use students to be catalysts for what they want in their learning (Genius Hour, Genius Bar). Make sure to get student feedback, allow for them to work on passion projects, and work on characteristics of collaboration, communication, and life-long learning. Have students share their learning with teachers and a global audience!

6. Innovate. Create time during the day to try new things! Have administration cover teacher classes so they can focus on planning and preparation for new strategies and ideas. Empower

teachers with the gift of time.

7. Build Professional Learning Networks. Encourage teachers to broaden their knowledge base and connections with others inside and outside of your building and establish collaborative teams (utilizing Twitter, professional learning communities, Google+, etc.). Use opportunities to teach staff how to best use Twitter and other tools to learn about areas of interest, and building their learning network beyond the schoolhouse.

8. Ask the Tough Questions. Compare/contrast an iPad, laptop, or Chromebook to a pencil. Is this used because students are engaged or is it truly being used as a tool for learning? Is the technology an add-on or a non-negotiable for this task? Which tool works best? As with anything, children must use the right tool for the right situation.

9. Categorize. Just like using a media center, children need to be taught and begin to learn when to use the appropriate application to meet the expectations of the activity they are working on. For example, creation tools: iMovie, Google Docs, PicCollage; or organizational tools: Google Drive, Evernote, Padlet. Every tool is not appropriate for every task.

10. Let Teachers Visit Teachers. Allow time for teachers to watch model tech use in action. This not only strengthens the learning culture of a school, but it also allows teachers to see how their colleagues may be using a technology tool or management of technology in a creative way. 

Jen Sieracki is math/science facilitator, and Raymond Giovanelli is principal at Grand Oak Elementary in Huntersville, N.C. They are active members of Discovery Education’s Discovery Educator Network.



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Meeting the Needs of English Language Learners

Researcher and ELL expert Jim Cummins has identified three keys to success in teaching students who are just learning English. Here's how technology can help.

In the Hartford Public Schools in Connecticut, the percentage of students who are English language learners “hovers around 18 percent of our overall population,” said Kelvin Roldan, chief communications and public policy officer for the district.

These 3,800 students come from very diverse backgrounds and speak more than 80 different languages.

“We obviously want to be responsive and deliver a high-quality education to every child in our district,” Roldan said. Yet the diversity of learners with a wide range of native languages and English proficiency levels makes this a complex task.

The programs that Hartford implements vary based on the structure of each school and the number of English language learners it serves.

“One of the misconceptions out there is that you can address the needs and the challenges of every single ELL student in the same manner,” Roldan said. But that’s not the

case, he said, “because ELLs are not all the same.”

While Hartford has improved its methods of ELL instruction, “we found it necessary to come up with an innovative and technology-driven approach that would help us drive quality across the district,” Roldan said.

To do this, district leaders turned to Middlebury Interactive Languages, a company with a track record of success in delivering a blend of online and face-to-face instruction in world languages.

In collaboration with Hartford teachers and ELL coordinators, MIL developed a series of supplemental online modules for English language learners in the middle grades, and Hartford teachers are piloting the new content this year.

Using these modules, which are aligned with the Common Core, “will give our students the opportunity for academic discourse and to interact with more complex texts over time,”

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Learners

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Roldan said. District leaders hope the modules will help accelerate the language acquisition process for their English language learners.

The challenge facing schools

Hartford isn't alone in facing a growing ELL challenge, or in seeking creative solutions. Across the nation, an estimated 4.6 million students are learning English as a second language, making English language learners "the fastest-growing student population in our schools," said Education Secretary Arne Duncan in a recent blog post.

It generally takes English language learners at least five years to catch up to native English speakers academically, said Jim Cummins, a University of Toronto professor and ELL expert. By contrast, basic conversational fluency typically occurs after two years.

Why does it take so long for English language learners to catch up academically? For one thing, "academic language is more complex and less accessible than conversational language," he said. Academic language is marked by the presence of low-frequency words, and students "don't find these words in conversation with their peers." They encounter these words only in classrooms and in printed texts.

Also, native English speakers continue to develop their proficiency with academic English as students who are learning English are trying to catch up. In essence, English language learners "have to run faster," Cummins said, "because they're trying to chase a moving target."

Given the significant challenge facing schools, how can educators respond? Cummins describes three keys to success in teaching English language learners:

- (1) Ensuring from the first day of a child's education that he or she has access to a variety of print resources and is engaged in literacy.
- (2) Ensuring that all teachers are prepared to scaffold their instruction across the curriculum, supporting the vocabu-

lary with visuals or demonstrations. This task shouldn't just fall to English teachers, Cummins said. "It's the job of every teacher."

(3) Ensuring there is a focus throughout the entire school on valuing students' culture, background, and language.

"If the lesson students get is they should leave their language and culture at the schoolhouse door, that is not a very affirming message," Cummins said, adding: "Are we constructing an



About 4.6 million students are ELL.

image of their first language as an asset—or as a problem?"

If it's the latter, then schools are "devaluing their identity," he said, which research has shown to be counterproductive to learning.

Across the nation, many schools are using ed-tech tools to support their teaching of English language learners by addressing these three keys to success. Here are some examples.

Engaging literacy

The Napa County Office of Education serves five K-12 districts in Napa County, Calif. More than 50 percent of the students in these districts are Latino, and many come from Spanish-speaking households, said Napa County Superintendent of Schools Barbara Nemko.

Napa County administrators were looking for a way to introduce these students to English at a very young age and encourage them to read, so they would

be immersed in the language before they started school.

In 2011, they piloted the use of Footsteps2Brilliance, a digital platform for building early literacy skills, with a small group of preschool students.

The product features interactive books that can "read themselves" to children in English or Spanish, Nemko said. As the words are being said aloud, they are highlighted in red so children can learn to associate the written word with the sound they're hearing. And kids can click on pictures within the story to see animations that help bring the story to life.

The preschoolers "were so engaged" by the program, she said. "They took to it like ducks to water."

The books can be used on any device, including smart phones and tablets, so children can access them at home—or even in line at the grocery store.

The results from the pilot program were "phenomenal," Nemko said. As the children devoured the digital books, assessment data showed a 250-percent increase in their English language skills.

"That's almost unheard of," she said, adding that students are learning "hundreds of new words a day" by using the system—and "parents are learning more English and using more English with their kids as well."

After this initial success, Napa County partnered with a private, non-profit foundation called Napa Learns to purchase a site license to the program, so all of the county's parents would have access at no cost. In addition, all preschool teachers received iPads to use the program in their classes.

"To me, this is a game changer," Nemko said. "It's helping us close the achievement gap before students get to kindergarten."

Scaffolding instruction

In Collier County, Fla., nearly 6,000 students—or about 14 percent of the total student population—are "active" English language learners, meaning they're in the initial stages of English development, said Sandy Stockdale, coordinator of ELL and world language programs for

the 44,000-student district.

Florida state law requires schools to educate their English language learners using an immersion model, so they are taught alongside their peers using the same curriculum that all students receive, Stockdale said.

As a result, when district officials are evaluating products for use in their classrooms, “we look for tools that can support a wide range of students and their needs,” said Traci Kohler, director of instructional technology for the Collier County schools.

One of those tools is Discovery Education’s Science Techbook, an interactive digital textbook that incorporates virtual labs, audio and video clips, and other multimedia features designed to reach different learning styles.

Collier County is using the Science Techbook in its kindergarten through eighth-grade classes. The product includes a number of features that help scaffold instruction for English language learners.

The product’s supports for English language learners have contributed to significant learning gains for these students.

Fifth-grade ELL students whose teachers used the Science Techbook reportedly scored 14 points higher, on average, on the state’s science exam than ELL students whose teachers did not use the Techbook as frequently—and English language learners were 66 percent more likely to score at a proficient or higher level in science as a result of using the product.

Affirming identity

In Hartford, district leaders were looking for a multimedia curriculum that could be used with English language learners in a blended learning environment to support their instruction in the core content areas. To develop this curriculum, they partnered with Middlebury Interactive Languages, which is now selling the content to schools nationwide.

The modules that MIL developed in

ideas from those texts, to be able to write academically around those texts.”

As Cummins noted, research suggests that English language learners have the most success when they see their own cultural identity affirmed and can relate their own experiences to the curriculum—and this idea is reflected in MIL’s new ELL modules as well.

As students progress through the modules, they are accompanied by a virtual companion who encourages them, suggests strategies, and offers support. Students can choose their virtual companion from a range of ethnically diverse characters.

In addition, MIL has recorded English language learners from the Hartford schools as they introduce themselves and discuss the content. “We use these videos to develop students’ listening comprehension skills,” Germain-Rutherford said, “but also as a way to show students their peers within the modules, people like them.”

As students progress through the modules, they are accompanied by a virtual companion who encourages them, suggests strategies, and offers support. Students can choose their virtual companion from a range of ethnically diverse characters.

For instance, an interactive glossary provides multi-modal definitions for more than 600 common science terms. Students can learn these vocabulary words “not in isolation, but in context,” Kohler said, with the help of text, animations, and video clips with audio support—including Spanish translations for native Spanish speakers.

The Science Techbook also includes Spanish-language versions of key content, including “Getting to Know” reading passages created for each concept. What’s more, students can hear the text read aloud, and each word is highlighted as it is said. Visuals further help students make connections between the words and concepts.

The Science Techbook “encapsulates all of our students’ learning modalities,” Kohler said.

partnership with Hartford educators are all project-based, said Aline Germain-Rutherford, Ph.D., chief learning officer for the company and a tenured linguistics professor at Middlebury College.

“We wanted to ensure that students were learning by doing,” she said. “And we’ve tried to scaffold the activities so they can adapt to students at different levels.”

The modules focus on helping students develop the academic English they’ll need to succeed in school. “This is where the coordination with teachers in Hartford was so important,” Germain-Rutherford said. “We looked at the type of texts that were used in the curriculum there, and we created activities to help students develop the skills to read those texts, to understand those texts, to be able to speak and to debate

The new curriculum is supplemented by a series of professional development webinars from MIL that cover topics such as scaffolding academic literacy, skills for lifelong language acquisition, and more. The company also offers on-site training for teachers.

The early response to the program “has been encouraging,” said Hartford Public Schools Superintendent Beth Schiavino-Narvaez in a statement. “The students have been energized to learn English and develop academic discourse, which is critical to language learning.” 

An eSchool News editor for nearly 17 years, Dennis Pierce is now a freelance writer covering education and technology. He can be reached at denniswpierce@gmail.com.

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- Align with Common Core and WIDA standards.

Why the blended teacher is still vital

By Peter West

With blended learning, the computer may provide much of the learning fundamentals and students must be more self-regulated than in a traditional industrial model classroom, but the teacher still plays a vital (albeit different) role.

School leaders need to be aware of this, and need to have pathways developed to transition teachers to this new environment. Thus, teachers must be trained in the different pedagogy, and this should impact the way professional development is delivered.

Student survey

The effect of the teacher is demonstrated by the results of a survey I recently conducted at my school with students in a self-paced blended learning course. All students used the same learning resources in “lessons” of the same duration and were in the same physical environment. The only factor that varied was the teacher. In this case, one teacher had not been trained in the differences between the self-paced blended learning environment and the traditional classroom; this teacher had to work out the differences on the fly. The other teacher had been working in a self-paced blended learning environment for more than four years and was successful and enthusiastic about the environment.

Survey questions

Students responded to a number of survey questions. There was a five-point scale for responses, with 1 being very positive and 5 being very negative, and with 3 being neutral.

The questions are shown below.

- How do you rate (overall) the way that we “do” this subject?
- How do you find the online tutorial approach affects your learning in class?
- How do you find the tutorial approach affects the speed of your learning?
- Do you find the online approach better for reviewing information?

- How easy is it to get help when you get “stuck” with a problem and you are not sure what to do?
- Your teacher talks less often in this subject than in a “normal” class. Is this better for your learning?
- Most of your time in class is spent “doing things,” with explanation from the teacher on occasion. Is this better for your learning?

This survey has operated in previous years and the results had been consistent. However, the survey discussed in this article highlighted “anomalous” results, which highlighted the need for teachers to be trained in the principles of teaching effectively in a blended learning environment (rather than just being told of the differences).

Student responses

When asked to rate the class, students were generally positive in their assessments. Students in both classes were overall reluctant to give either teacher poor marks, but the class taught by the teacher comfortable with blended learning topped the “anomalous” class—significantly—in every question. The students in the comfortable blended class averaged mainly 1s and 2s in their assessments, while students in the other class averaged responses that crept closer to “neutral.”

In fact, the percentage of students in the blended class who answered the questions positively (1 or a 2), rather than neutrally (3) or negatively (4 or 5), typically was more than 70 percent. The “anomalous” class had a much lower percentage of students responding positively.

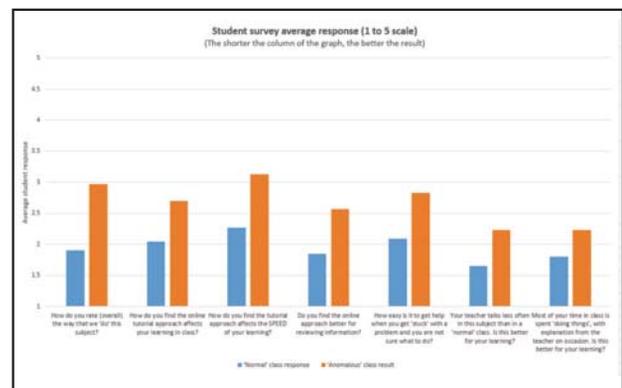
Conclusion

Classes of students vary in many ways, and differences between classes always exist. Teachers interact with

classes in different ways, and this is part of the individuality of teaching and learning. Surveys can always be improved, and we should all be cautious about results from a single survey.

However, the results of this survey combined with a knowledge of previous survey results, a working knowledge of the school, the course and the students highlighted some good points. This survey result, combined with some other feedback, led to a change in the style of professional development provided to staff. In an effort to better prepare teachers for a blended learning environment, professional development was restructured to a blended learning model, allowing teachers to experience more facets of the learning environment being introduced.

Leaders of schools need to ensure that teachers who work with blended learning courses are trained in the pedagogical



differences between the blended learning environment and the traditional classroom. Assuming that a teacher will automatically know what to do can create problems. It may add unnecessary stress to the life of the teacher, and it may hamper learning outcomes of students. On a larger scale, it may produce the perception amongst students, parents, and teachers that blended learning “doesn’t work;” blended learning “works”—we just need to ensure that we adequately prepare for its implementation. 

Peter West is director of eLearning at Saint Stephen’s College in Australia.

How social media can help pass bond issues

School leaders share social media strategies that successfully support district efforts

By Lucille Renwick

Pattonville School District, in St. Ann, Mo., launched its Facebook page in July 2013, just a few months before its Prop P tax levy went before voters. Prior to that, the district's only social media presence was a Twitter account with about 140 followers.

In the months following the Facebook page launch, the district heavily used the social media site to communicate facts about the tax levy. By election day, the Facebook page had more than 46,000 views and received 1,800 Likes. The bond passed with a 70.2 percent Yes vote.

"We knew social media could play an important role in spreading accurate, factual information among parents and

- **Keep your information brief and pertinent.** Keep social media messages short and conversational. Dole information out in small bites. Remember, people aren't reading; they're scanning.
- **Let your local citizens' committee handle the "Vote Yes" campaigns.** Local citizens can freely advocate for bond issues. The committee should set up a separate account to handle any information that includes openly supporting a bond. However, it's important for the overarching messages and information between the district and the committee to be aligned. The two efforts are separate, but complementary.
- **Don't get sucked into negative online debates.** Bonds are a tough

broken pipes, video will do more than lots of words. Social media users also like photos and infographics. The successful Streetsboro City Schools (Ohio) bond campaign included different images of residents, students, and logos.

- **Know your legal context and the existing parameters.** Make sure you understand the legal framework for your state and/or local school district. School districts are not allowed, by federal law, to promote bond issues, but can use social media and websites to provide information and facts about a bond. What the local bond committee does separately should be clearly labeled with disclaimers such as "Paid for by Citizens for ABC School Bonds." Carr said district leaders also should check school board policies.
- **Match your message and medium to your audience.** Don't treat all social media outlets as the same. While there's some overlap, people tend to gravitate to different social media outlets. The demographics on Twitter, Facebook, and YouTube tend to fit the audiences most schools and districts need. Most parents of school-aged children use Facebook, Twitter, and sometimes Instagram. Teachers and moms also use Pinterest.
- **Create a timeline for your communications and social media campaign.** Waukee Schools' (Iowa) began its bond campaign 16 weeks before election, but started using social media nine weeks prior to the election, with each week focused on specific information such as a "Save the Date," absentee ballot information, etc. Feeds were posted to Twitter and Facebook with links to the district's website and its Frequently Asked Questions section. 

Social media campaigns have become especially important as more district leaders face tight budgets and a voter base reluctant to pay more taxes to finance repairs and new equipment.

staff," said Mickey Schoonover, director of school-community relations for the district.

Social media campaigns have become especially important as more district leaders face tight budgets and a voter base reluctant to pay more taxes to finance repairs and new equipment—even as buildings age, technology grows obsolete, and other expenses mount. Here are some top tips from district leaders and bond committee members who've been there:

- **Incorporate social media as part of a wider plan.** Use social media to support key messages. Social media isn't an "instead of", but an "in addition to" tool, said Rick Kaufman, director of community relations at Bloomington (Minn.) Schools. It should be an integral part of your campaign, and is one of many strategies you will want to deploy.

sell because they often come with a tax increase. Opposition to bonds can get ugly, but as tempting as it is to fight back against naysayers or block negative comments, try to stay above the fray. Provide accurate information to clarify misconceptions.

- **Have a comprehensive communication plan for the campaign.** Outline what you want to accomplish in the campaign, the audiences you need to reach, and your key messages. Next, map out specific, measurable strategies targeted to those audiences, said Kaufman. Include social media in the overall plan.
- **Use images and video.** Recent studies show that social media users like and respond better to video than words, says Nora Carr of Guilford County Schools in North Carolina. If you want to show leaky roofs and

Lucille Renwick is a contributing writer for eSchool News.

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Little Bits of scaffolding result in big learning outcomes

Very young students often have a hard time engaging meaningfully in electronics projects. Sure, most middle school kids can learn the function of basic electronic components and follow a set of instructions to create a basic circuit on a bread-



Trevor Shaw

board. Often, however, their work suffers from the mistakes, short-circuits, and sloppiness that plague any novice.

More limiting than the struggle to keep bare wires from accidentally brushing each other, is the wall that most students hit after they create the alarm circuit or lie detector that they built from the schematic in the textbook.

While their imaginations are ripe with ideas of things they might like to build, most young students lack the fundamental knowledge to push beyond the canned circuits provided by their teacher and to create something original.

By limiting a student to the re-creation of pre-designed circuits, we are teaching her how to pay attention to detail, how to carefully follow instructions, and how to perform a variety of specific tasks such as stripping the insulation from wire and how to install an IC into a breadboard.

If our aspirations for our hypothetical student involve work on an assembly line, this will be all the training she needs. But if we want a little more for our kids, we will need to set the bar higher.

By following instructions to build pre-designed circuits, our student is not learning how to visualize how her idea might operate in the physical world. She isn't learning how to brainstorm various design ideas, test them out, and persist through failure. We are not asking her to create.

One could make the argument that the tedium of producing pre-designed circuits is the price of admission to

more advanced and interesting topics. We can only begin to create new things after we completely understand the things that have already been created.

There is some truth in this, but the problem is that if we want to begin working with very young kids, it

will be a very long time before they gain the knowledge and expertise to truly create meaningful and interesting things. If we are not very careful, we will lose some of our best minds to boredom or frustration. Kids will decide early-on that electronics, engineering, or technology are not for them because they haven't found a way to create.

There are many solutions to this problem, but an excellent one comes in the form of Little Bits—a collection of magnetic blocks that click together to build very sophisticated circuits that interact with the real and virtual worlds.

Each bit is a different type of electronic component ranging from the very simple (a push button) to the high-end (digital logic gates). There are even bits that can connect a student invention to Wi-Fi and others that can be programmed with the Arduino language. The bits are color coded—blue is power, pink is an input such as a motion sensor, and green is an output such as a buzzer. Thus, with only three bits, a student could build a motion-triggered alarm system.

Bits click together magnetically, so it is impossible to put them together incorrectly—no more guessing to get the polarity right on an LED.

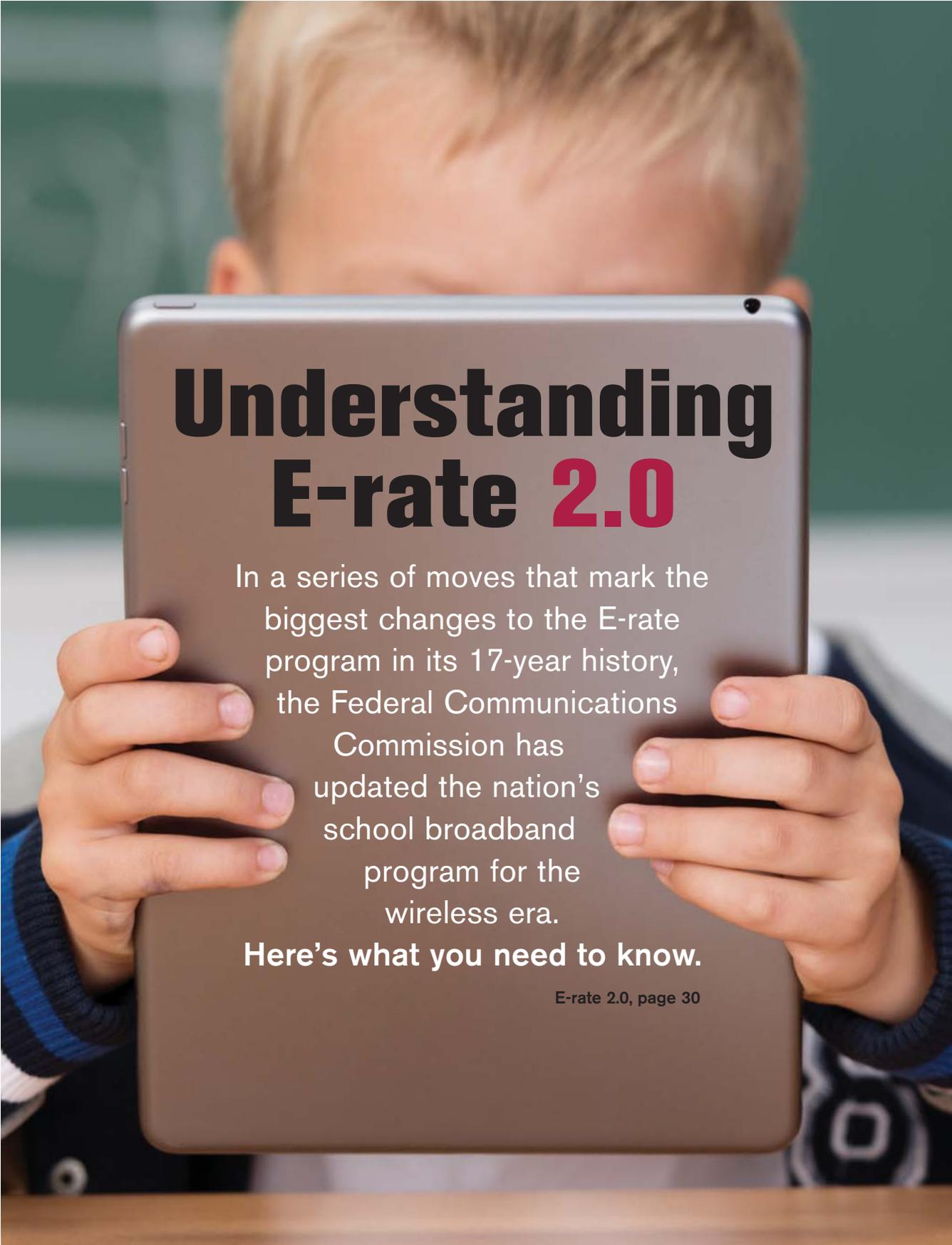
They can make mistakes, but the causes of a mistake are much more limited and easier to troubleshoot than a traditionally designed circuit. For example, on even the simplest breadboarded circuit, a failure could have dozens of possible

causes. If a Little Bits invention doesn't work, on the other hand, the complexity of a light sensor is bundled into the simplicity of a magnetic block limiting the possible causes of failure and making the entire circuit much easier to troubleshoot. Students debug their circuit at a much higher conceptual level than they would have to if they had built it from individual components on a breadboard. This empowers even a very young student to engage in meaningful troubleshooting of her invention rather than tossing up her hands in frustration.

The scaffolding provided by Little Bits also gives students exposure to highly sophisticated electronic components adding items to their toolbox. This will serve them well when they do eventually get to breadboarding by helping them to imagine what is possible. I push the development of this understanding by requiring them to come to me with a shopping list of each bit that they want. They need to ask for it by name and explain to me what they are using it for in their circuit.

For my money, the most interesting aspect of a student invention is the things she builds around the Little Bits rather than the bits themselves. A student might use a laser pointer to activate a light sensor, connect a pulley made of cardboard to a DC motor, or craft a float switch to detect the water level in a pet's bowl. These are all ways for students to combine technical knowledge with creativity in a way that helps them really understand that they have the ability to imagine something into existence. 

Trevor Shaw has worked as an ed-tech leader, speaker, writer, consultant, and classroom teacher for more than 20 years. He is currently the director of technology at the Dwight-Englewood School and can be reached at @shawt, +TrevorShaw, and shawt@d-e.org.



Understanding E-rate 2.0

In a series of moves that mark the biggest changes to the E-rate program in its 17-year history, the Federal Communications Commission has updated the nation's school broadband program for the wireless era.

Here's what you need to know.

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E-Rate 2.0

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Schools and libraries will have an extra \$1.5 billion per year to help them deliver broadband access to students, thanks to new action taken by the Federal Communications Commission.

The agency's Dec. 11 vote raises the annual funding cap for the E-rate program from \$2.4 billion (adjusted for inflation) to \$3.9 billion. Combined with earlier action taken in July, the move further positions E-rate as a way to close troubling broadband access gaps in U.S. schools.

According to a recent Consortium for School Networking survey, 57 percent of K-12 chief technology officers believe their networks aren't robust enough to support digital learning—and 40 percent of classrooms don't have Wi-Fi or other broadband access.

To address this problem, the FCC has undertaken the largest reforms to E-rate in the program's 17-year history. The agency approved the first of these sweeping changes on July 11.

Together, these actions transform the program in ways that will have a significant impact on schools in 2015 and beyond.

The changes will result in more funding for the equipment needed to extend broadband access within schools and libraries, including routers, switches, wireless access points, wireless controllers, and other Wi-Fi equipment. What's more, new rules aim to spread this funding to a much larger number of applicants, ensuring support for schools that haven't received E-rate discounts on internal connections before.

However, the tradeoff for schools is that E-rate support for voice-related services is being phased out over the next five years.

In this report, we'll look at these changes in more detail and explain what they'll mean for your schools.

More Wi-Fi support

Until now, Wi-Fi and other internal broadband connections were considered Priority 2 services and were funded only

after all requests for Priority 1 services (telecommunications services and internet access) were met. However, that left most schools without any E-rate funding for internal connections.

The FCC's Seventh Report and Order, issued in July, changed the description of these services from Priority 2 to Category 2. To spread Category 2 funding to the broadest number of applicants possible, the FCC has taken two key steps: (1) It has limited the maximum discount on these services at 85 percent instead of 90 percent, and (2) it has capped the amount of funding that applicants can receive on these services within a five-year period.

For schools, the cap amounts to \$150 per student on the pre-discount cost of Category 2 services over five years.

For instance, a school with 1,000 students that qualifies for a 60-percent discount could buy up to \$150,000 in Wi-Fi equipment in the 2015 funding year, receiving \$90,000 in E-rate discounts to offset the cost—but then it would be

ineligible for further Category 2 support for the next four years.

To ensure that smaller schools can buy the minimum amount of Wi-Fi gear they need, the FCC created a "funding floor" of \$9,200 per building. (Again, this refers to the pre-discount price of equipment.)

So, a 60-percent discount school with only 50 students would not be limited to \$7,500 in Category 2 services over five years; instead, it could spend up to \$9,200 and receive up to \$5,520 in E-rate support during this period.

The FCC has put a lot of thought into these figures, taking into account both the fair-market cost of reasonably equipping classrooms with Wi-Fi and the number of K-12 classrooms nationwide—and the agency believes its calculations will extend Category 2 funding to meet the needs of any school or district.

Changes in eligibility of equipment

The FCC's Seventh Report and Order transformed E-rate from a telecommunications program into a broadband program that focuses on the delivery of high-speed internet service to and within school buildings.

To ensure enough money to meet the demand for Wi-Fi and other internal connections in the next five years, the FCC has made significant changes to the kinds of services that are eligible for E-rate support.

For instance, the FCC intends to phase out funding for all voice-related services over the next five years. E-mail, voice mail, and web hosting no longer will be eligible for E-rate discounts beginning in the 2015 funding year.

Also ineligible now are all products and services that fall under these categories: circuit cards and components; interfaces, gateways, antennas, and servers; storage devices; video components; and data protection components, other than firewalls, uninterruptible power supplies, and battery backups.

Caching servers, which store information locally so it can be accessed



Schools and libraries will have an extra **\$1.5 billion** per year to help them deliver broadband access to students, thanks to new action taken by the Federal Communications Commission.

more quickly, now will be E-rate-eligible. The FCC views these devices as tools to help school systems optimize their network performance—resulting in “more efficient use of E-rate funding,” the agency said.

Support for the basic maintenance of internal connections is still available as well, but only if the equipment is eligible under the new program rules—and only if schools haven’t exceeded their five-year limit on Category 2 funding.

Because of this five-year cap, K-12 technology leaders will have to think strategically about their Wi-Fi needs—and they should look at purchasing equipment with a five-year life cycle in mind.

In its Dec. 11 action, the FCC voted to extend E-rate funding to dark fiber as well. Dark fiber allows schools to lease future capacity without actually transmitting data until they need this capacity, the agency explained—and it “can be an especially cost-effective option for smaller, rural districts.”

Managed Wi-Fi

In its Seventh Report and Order, the FCC referred to a new category of service that is eligible for E-rate support: managed Wi-Fi, or “managed internal broadband services” as the agency calls it.

Before, schools could apply for E-rate discounts only on the purchase of routers, switches, wireless access points, and other internal connections, or on the basic maintenance of this equipment. Now, the FCC’s new rules allow schools to enter into contracts that call for Wi-Fi providers to install and manage this equipment—and this full-service approach to wireless service would be E-rate eligible.

This change “will allow schools, for the first time, to leverage E-rate discounts to outsource major aspects of delivering on-campus broadband connectivity,” said John Harrington, chief executive officer of the E-rate consulting firm Funds For Learning. “This is analogous to a school cafeteria considering bids to manage their kitchen and serve students meals.”



The FCC has put a lot of thought into these figures, taking into account both the fair-market cost of reasonably equipping classrooms with Wi-Fi and the number of K-12 classrooms nationwide.

These types of agreements “could lead to improved network performance,” Harrington added.

In explaining its decision, the FCC said that managed Wi-Fi services “can provide substantial benefits and cost savings to many schools and libraries, particularly small districts . . . without a dedicated technology director available to deploy and manage advanced [networks] quickly and efficiently.”

Managed Wi-Fi will be eligible for E-rate support as a Category 2 service, and although schools can enter into multiyear contracts for this type of service, they would have to apply for E-rate funding separately each year. “We will

not make multiyear commitments,” the FCC said.

Using the agency’s newly created funding cap of \$150 per student on the pre-discount cost of Category 2 services over a five-year period, schools would be eligible to apply for E-rate discounts on managed Wi-Fi services costing up to \$30 per student, per year. “This is consistent with the price of managed Wi-Fi services in the market today,” the FCC said.

Only time will tell if managed Wi-Fi will have mass appeal among K-12 schools, Harrington said. But the fact that it’s E-rate eligible could give rise to

E-rate 2.0, page 34



Intelligent Wi-Fi is the Foundation of Digital Learning

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Bringing 1:1 Learning to Kids in North Carolina



A 1:1 learning program has improved access to learning opportunities for 4,600 students in Person County, just a quick drive north from Durham, N.C. But after the initial rollout, the popularity of mobile devices quickly outstripped the classroom networks' ability to support rich media, collaborative learning and online assessments.

"When you count all the Lenovo laptops, iPads, and e-readers, there are actually more wireless devices than students in the district," says Ashley Cooper, director of technology, testing and student information at Person County School District. "Most of the devices we purchased over the last four years were 2.4 GHz. That became a major issue."

Teachers rushed to be the first to get their classes connected to the Wi-Fi, and as congestion grew throughout the day, teachers were forced to abandon their digital lesson plans. "We had a predicament," says Cooper. "Connectivity was a huge issue and we had to fix it. We had to look for a solution that would resolve our issues now and at the same time, set us up for the next five years."

Funding the wireless LAN through the FCC E-Rate program meant that price was the top consideration, but Person County learned that buying a Wi-Fi solution to meet a budget can result in a poor user experience. For its upgrade to 802.11ac, the district looked for the most affordable and best wireless LAN solution, and then funded as much as possible through E-Rate until it is rolled out completely.

With an 802.11ac Meru Education Grade (MEG) network, learning is no longer interrupted. "We do classroom assessments, district benchmark assessments, and all the state assessments that are allowable online," says Cooper.



"We will be doing more online testing and using digital textbooks, and with our Meru network, we are prepared."

— Ashley Cooper
Person County
School District

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CASE STUDY**

A Massive Commitment to 1:1 in Miami-Dade County



More than 340,000 students attend Miami-Dade County Schools, the fourth largest district in the U.S. With a commitment to providing educational excellence, the district is leveraging digital learning to prepare its highly diverse student community for college, career and life in the 21st century.

“Our 1:1 initiative is really what we call a ‘digital conversion.’ We’re taking instruction from the traditional teacher lecturing the class to a personalized, collaborative and differentiated learning program,” said Debbie Karcher, CIO, Miami-Dade County Public Schools.

District administrators leveraged E-Rate funding to expand the 1:1 program across even more grade levels. Miami-Dade’s MEG network now supports 150,000 students, and when the rollout is complete, it will connect all students and teachers in 392 schools.

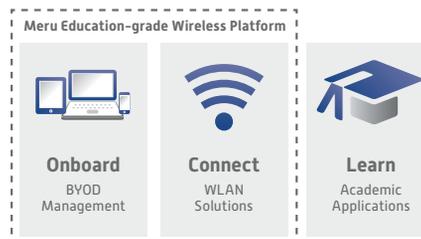
Miami-Dade also uses Meru Connect to automate network access for district-owned and guest devices. Offering self-service network access eliminates IT hassles while upholding strong security based on established policies.

Intelligent Wi-Fi for Uninterrupted Learning

Successful learning in the classroom means connecting students, devices and apps—every time, without fail. Meru’s intelligent wireless network solution provides the fast, reliable connectivity that schools need to support learning today. And, like many school districts, Person County and Miami-Dade obtained funding from the E-Rate program to subsidize their wireless LAN purchases, starting with the schools with the greatest need. **READ E-RATE SURVIVAL GUIDE EBOOK.**

The Meru Education-grade (MEG) solution solves schools’ 1:1 and BYOD challenges by supporting learning-essential applications. With MEG, schools can:

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2. Connect all 1:1 and BYOD devices reliability anywhere on campus.
3. Learn by deploying validated learning applications on mobile devices over the MEG wireless.



With Meru, districts can connect students, devices, and apps with an intelligent, agile, and open network to support interactive educational content, lively collaborative sessions, online assessments, and other essential learning tools.

Learn about the latest updates to the E-Rate program and tap into Wi-Fi resources, including:

- Real-time updates to E-Rate program
- E-Rate 2.0 Survival Guide e-book
- E-Rate 2.0 and Wi-Fi on-demand webinar
- Person County Schools video case study
- Miami-Dade County Public Schools video case study
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“The Meru Wi-Fi network has worked extremely well to support our 1:1 learning objectives and it continues to scale and meet our requirements. Meru is rock-solid.”

— Debbie Karcher,
Miami-Dade County
Public Schools

**READ THE
CASE STUDY**

With Meru, districts can connect students, devices, and apps with an intelligent, agile, and open network to support interactive educational content, lively collaborative sessions, online assessments, and other essential learning tools.

GET E-RATE ANSWERS

E-rate 2.0

continued from page 31

a new market segment.

“At a minimum, school technology leaders have been given the freedom to consider these arrangements without sacrificing E-rate funding,” he noted.

Dialing up new voice options

Voice mail, paging services, and directory assistance no longer qualify for E-rate discounts beginning with the 2015 funding year. And if the FCC has its way, the E-rate will phase out *all* support for voice-related services within the next five years, including plain old telephone service, toll-free service, and even voice over IP (VoIP).

This change could have a dramatic effect on school district budgets—and it likely will force school business and IT leaders to reexamine their options for voice-related services.

With the E-rate historically supplying more than \$800 million in discounts on voice-related services each year, schools stand to lose a significant amount of funding for these services.

This phase-out will happen more quickly for some schools than others. Beginning with the 2015 funding year, schools will see their discount percentage on eligible voice services reduced by 20 percentage points each year, until they no longer receive any voice-related support.

So, if your school district qualifies for a 90-percent discount on telecommunications services, in 2015 you’d get a 70-percent discount on your phone bill. In 2016, you’d get a 50-percent discount; in 2017, you’d get a 30-percent discount; in 2018, you’d get a 10-percent discount; and in 2019, you would not receive any E-rate discounts on telephone service.

But if your school district only qualifies for a 20-percent E-rate discount,

you’ll get no E-rate support for your phone bill in 2015. Even the poorest schools will only have four more years of E-rate discounts on voice-related services—and most schools will have only one or two more years of voice support.

This rule change is controversial, and many school leaders had urged the FCC not to adopt it.

In making this change, the agency acknowledges that schools will have to pay more for voice-related services, but the savings they’ll realize on broadband services will help offset this cost, officials say.

Although hosted VoIP service no longer would be eligible for E-rate support under the new rules, Harrington believes the rules might strengthen the business case for VoIP, because without E-rate support for phone service, schools will need to explore more cost-effective options for their voice service.



es—and VoIP lets them leverage their investments in their broadband networks in a very cost-effective way.

“If you can reduce your phone bill, you’ll need to now more than ever,” Harrington said. “This could help accelerate the adoption of VoIP.”

Cutting costs, improving efficiency

Other changes to the E-rate program are designed to control costs and improve efficiency. For instance:

- Starting this year, applicants will be able to see how much other schools are paying for similar kinds of services—and this greater transparency into E-rate contracts could lead to better pricing. The Universal Service Administrative Co., the agency that administers E-rate, will post information about the services bought by applicants, as well as these line-item costs, on its website.
- To encourage better pricing through master contracts, the FCC’s Wireline Competition Bureau was given the authority to designate “preferred master contracts” for Category 2 equipment. Applicants won’t have to file a Form 470 to request services included in these master contracts, although they will have to consider these services in their evaluation of E-rate bids.
- To encourage bulk purchasing, the FCC has changed its rules on consortium applications. Starting in 2015, the E-rate forms will distinguish whether the leader of a consortium has the authority to make final buying decisions for its member districts—or whether it only has the authority to seek competitive bids on behalf of members. This change opens up membership in a purchasing consortium to schools that don’t want to hand over full buying power to another entity.
- To encourage more multiyear contracts and to expedite the review of these contracts, applicants will be required to fill out a complete Form 471 only once for these services, in the first year of the contract. After that, applicants will be able to submit



To encourage more multiyear contracts and to expedite the review of these contracts, applicants will be required to fill out a complete Form 471 only once for these services, in the first year of the contract. After that, applicants will be able to submit a streamlined application for each remaining year. The maximum length of a multiyear contract is five years.

- a streamlined application for each remaining year. The maximum length of a multiyear contract is five years.
- Applicants no longer will have to submit a technology plan to receive funding for Category 2 services. But just because you don’t have to file a technology plan doesn’t mean you shouldn’t have one, the FCC said.
- Some low-cost purchases have been exempted from the FCC’s Form 470 posting and bidding requirements. If you’re spending \$3,600 or less per building, per year, on the pre-discounted cost of internet access with at least 100 megabits per second of downstream bandwidth and 10 Mbps of upstream bandwidth, you won’t have to file a Form 470 and competitively bid this service.
- The FCC has relaxed its rules about signing a contract for E-rate services before filing a Form 471. Acknowledging that it can be hard to get all the required signatures before the filing deadline, the agency has amended its rules to state that you

- need “a signed contract or *other legally binding agreement* in place” before filing a Form 471.
 - Beginning in 2016, applicants will be allowed to invoice USAC directly for reimbursements on E-rate-eligible services they pay for in full. Before, USAC would release funding only to service providers, which then would pass on the funding to schools—but this required a lot of coordination between applicants and their service providers.
- In exchange for these and other changes, the FCC has added more stringent rules to guard against waste, fraud, and abuse. For example, applicants must keep all documentation for 10 years instead of five, and they have to let USAC officials inspect any installations if requested. 

An eSchool News editor for nearly 17 years, Dennis Pierce is now a freelance writer covering education and technology. He can be reached at denniswpierce@gmail.com.

A background image showing three students in a classroom setting, focused on their laptops. The students are in profile, looking towards the left. The foreground student is a young man with curly hair, wearing a light blue button-down shirt and a black wristband. The middle student is a young woman with long blonde hair, wearing a purple top. The background student is a young man with dark hair, wearing a light blue shirt. They are all sitting at a desk with several laptops open.

Will Your Wi-Fi Pass the Test?

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Digital learning demands fast, reliable Wi-Fi, and the expansion of the FCC E-Rate program is an opportunity to make sure your wireless LAN solution is ready for interactive content and classrooms filled with tablets and laptops.

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Innovative ideas for the tech-strapped teacher

Slow internet? No devices? Here's how to make the most of limited classroom tech

By Elaine Plybon

School districts in the United States spend billions of dollars each year to purchase technology for the classroom, yet the lack of technology and internet access in the nation's public schools continues to be an issue. Often, a teacher who is faced with little technology in the classroom will feel overwhelmed and will resort to more traditional teaching methods.

This article outlines strategies for teachers to increase the impact of the technology to which they are limited. I have purposely left coordinated and intentional Bring Your Own Device programs off of this list. Even with the best-planned BYOD program, there will be students who do not have devices to bring.

These are strategies I have used in my experience in education, which began in a room with one computer and no projector, as well as strategies I have helped teachers to implement in my role as a professional development consultant and instructional coach. It's important for teachers to focus not on what isn't in their classroom but rather how they can use what they have.

1. Making do with what we have (and possibly spending a couple bucks). When I found myself in that low-tech room, I had choices to make. Would I resort to drill and kill worksheets and lecture-style delivery of instruction? After all, I only had one computer, which was in the classroom for the sole use of the teacher. The school had a computer lab in the library, but scheduling time in the lab was difficult and the computers there didn't allow students to save their work.

My solution? The librarian had a fleet of large televisions. She also had S-video cables. I connected my computer to a television and it sat in my room for the rest of the year, projecting presentations and websites during my beginning years of technology integra-

tion. I would allow one student at a time to sit at my desk to explore websites while the rest watched.

Today, regardless of the type of device you find in your classroom, there is an adapter that can connect it to a television or to a discarded computer monitor. More importantly, a cheap wireless mouse has a range as large as most classrooms. Handing the mouse around the room turns that television into an interactive screen.



Ask parents to donate old devices.

2. One man's trash is another teacher's treasure. When technology is thrown away, it doesn't necessarily mean it is unusable. Technology becomes outdated very quickly and some people believe it to be worthless. For a teacher who has no technology in the classroom, it can be a valuable gift. Even within a campus, one teacher may discard technology that would be welcomed in another teacher's classroom.

Take regular walks around campus to see what other teachers have lying around. Visit the district technology office to sort through the boxes of equipment they plan to sell at auction. Even if the equipment doesn't work, you'll find cool gadgets for students to tear apart and repurpose in that maker space you always wanted.

Parents are a valuable resource, as well. That old smart phone, or even flip phone that has a camera? They can be charged and used as digital cameras for

photographs and videos. If they were able to connect to the internet when the parents used them, they can still connect to the wireless at the school, even without a data plan. Ask parents to donate their old phones when they upgrade. It is tax-deductible, and your formerly technology deprived classroom could become 1:1 with mobile devices.

3. Use free resources. This may seem obvious, but I see teachers and administrators spending money on apps and subscriptions without hesitation. I have found that, most of the time, an app that costs money or a website that charges for a subscription often has a competitor that is free. While it is true that you get what you pay for, many of these free providers are getting paid, just not by you. Investors seek the opportunity for philanthropy and teachers and students benefit.

Today's app market is changing. More and more applications require only an internet browser to operate. Free browser extensions abound for browsers like Google Chrome and Mozilla Firefox. Some of those extensions perform the same tasks as those 99 cent apps do, and 99 cents times multiple devices adds up.

4. Grants. As I mentioned, there are investors who are interested in donating money to schools. Teachers just have to know where to look. Large corporations, such as Walmart, Coca Cola, and Sprint have applications on their websites for individuals and teachers to request funding. These grants can range from hundreds to thousands of dollars. Look for corporations that have corporate foundations, such as those found on this list from the Foundation Center.

Many school districts have education foundations and parent organizations that offer grants to teachers. Some of them allow teachers to submit requests several times each school year. Even if a request is for just one device, that is

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one more than you had before, and multiple requests could eventually equip your classroom.

5. Centers-based learning.

Elementary school teachers have used centers-based learning for years, but secondary teachers are often resistant. Centers can stretch the technology that exists in a classroom to allow every student opportunities to interact with it. Rotating groups of students through reading stations, writing stations, listening/viewing stations, and hands-on activity stations, with or without technology is a best practice. When combined with an interactive computer station, students can not only explore, but also create with just a few devices for an entire class of students.

6. Integrating technology with one device. I recently worked with teachers in an area that not only had very few computers, the technology they had was outdated and they only had dialup internet access. The reality of that inspired me to find ways that a single device could be used in the classroom. Even if you are in a situation where your students cannot put their hands on technology, they can still benefit from the engagement that alternative methods of direct instruction allows.

I'm not talking about sitting the students in front of a screen and showing them videos for an entire class session or supplementing your lecture with a digital presentation. Suggestions such as using an image to start a conversation about author's purpose, movement, or a period of history or making predictions can be a powerful way to integrate technology into direct instruction.

Using a short video clip with the audio removed can be a meaningful summative assessment when a student is tasked with recording, or even writing on a piece of paper, the narration for the video. Creating an interactive presentation with images and hyperlinks can increase engagement when students are asked which image the teacher should

click on next. None of these strategies requires internet access, either, so even the most technology-poor classroom can incorporate these solutions.

I have also seen classrooms that used the concept of technology in their classroom with nothing more than a piece of notebook paper and a pencil. The concept of explaining a character by drawing a fake Pinterest board is the same as when a student uses technology to create a digital version.

7. Get apps for free. If you must use an app for a mobile device or browser that costs money, wait for it to have a temporary price reduction or giveaway. Many app developers will temporarily lower their prices or even give away apps in an effort to build their market. In response, some app developers have created apps that help you keep track of these opportunities. AppsGoneFree is a resource for iOS operating systems that provides daily information about apps being offered at a free or reduced price. Another handy, free tool is AppShopper. AppShopper is a web-based app finder that allows users to create lists of apps they want, but are not willing to pay for. AppShopper will notify users when that particular app has a price drop, and also provides updates on reduced-price apps.

8. Turn mobile devices into a free classroom response system. Many campuses choose to invest a significant amount of money into classroom response systems, or "clickers." These response systems provide an opportunity for students to interact with prompts provided by their teacher and for the teacher to accumulate data to use for formative assessment. Rather than investing money in those systems, a workaround is to use mobile devices with a free web-based system. These systems work on any device that can connect to the internet. Remember those old phones you asked parents to donate? They can be used as "clickers," as can laptops and even handheld gaming systems that have internet capability.

There are several I have tried. Two have become my favorites, with one an honorable mention. The one I have used

the most is Socrative. Socrative can be used for multiple choice, short answer, voting, quizzing, and competitions. It can integrate images, provide downloadable reports for the teacher, and is extremely easy to use. Students simply point their browser to m.socrative.com and enter the teacher's room. The teacher controls the prompts that are sent to the device. Its ease-of-use and compatibility across platforms is what makes this one my favorite. Teachers can decide "on-the-fly" to use Socrative—it is that easy.

Another favorite, for another purpose, is Kahoot, which makes it easy for teachers to gamify the learning experience by creating a quiz show format for review questions, instruction, and information gathering. I have seen teachers get just as excited about participating in a Kahoot at a professional development workshop as I have seen students get in the classroom.

The honorable mention is InfuseLearning. I haven't used it a lot because it doesn't work across all platforms and the performance is sometimes spotty. The reason I think it is one to keep on the radar is that, although it is very similar to Socrative, it has additional answer formats, such as Likert scales and sorting.

The bottom line. Think about what you want to have, take inventory of what you actually have, and work toward the dreams you have of a technology-rich classroom. Building that bridge, one piece of technology, one free app, or one piece of donated equipment at a time is always a better strategy than staying where you are. As you think of creative ways to stretch your technology, you will find it getting easier and easier and in the stretching, you just may come up with a better experience than you would have had if you had unlimited funds to devote to technology purchases. 

Elaine Plybon is a facilitator of transformative learning at Keller ISD in Texas.

The Rock 'n Roll Superintendent

Darryl Adams' unorthodox route to becoming Coachella Unified School District's superintendent fuels visionary thinking that topples barriers to success in the community.

Not many superintendents can claim they toured the country opening for Hall and Oates in the 1980s. But Dr. Darryl Adams, of Coachella Unified School District, isn't your typical superintendent. "I've always had a knack for making the impossible possible," remarks Adams. In 1984, he was in the first all-black rock band in heavy rotation on MTV and had a hit song on the radio. After eight years of touring with his band, he decided to teach his love of music, and became a music teacher at the Los Angeles Unified School District. Soon after that, he became a principal, and then got his doctorate, which led him to his current position at Coachella. "As the leader of my band, I developed the ability to make things happen and serve people," says Adams. "I've always been on the side of trying new things, exploring new ideas, continuously improving whatever is good, and never accepting the status quo. And this quality is as important for education as it was for music."

CUSD is one of the poorest districts in California. One hundred percent of its students are on reduced lunch. There are high populations of undocumented students, and students living on Native American tribal lands. When Adams stepped in as superintendent in 2010, one of his first goals was to show the community that regardless of their socio-economic status, the district can provide to them a 21st-century education that fully prepares their students for college, careers, and citizenship. "One of the most important statistics that I saw when I began working here was that only 60 percent of our students who went on to college actually graduated with a diploma," explains Adams. "They earned their high school diploma, but they weren't being prepared for college. We want to prepare them for the three C's so they can have a better life.

But in order to do so, we had to transform the system in a bold way."

In November 2012, Adams and his team brought the community together to approve Measure X, a technology bond that funds a pre-K-12 one-to-one iPad program. "We did a huge campaign to present this technology bond before the community," explains Adams. "We showed them the benefits of using these devices, and we said we can do this, but

explains Adams. "24/7 access is a critical issue, because if you don't eliminate that digital divide, that gap between the students whose families can afford a connection and those whose families can't will continue to grow."

At the start of the initiative, in 2012, he district shared a 3GB broadband connection with two other districts in the county, which connects through a third-party ISP to the node, meaning



Adams led a districtwide one-to-one iPad program starting in 2012.

you've got to vote for it, and you've got to be willing to tax yourself to do it. You can't wait for the state or federal governments to provide this opportunity to our students. You've got to take your future into your own hands." The measure passed with sixty percent of the vote and the one-to-one initiative rolled out with built-in buy-in from the community, the unions, the students, and the local politicians.

The main challenge to the initiative's success has been connectivity, both in regards to the district's broadband network and in regards to getting affordable internet plans for the students' homes. "We've promised the students and the parents 24/7 learning in a 21st-century teaching and learning environment,"

their network was quickly overloaded with 18,000 student devices, 800 teacher devices, computer labs, and administrative systems connected to the network, which spans 23 school sites. The network has since been upgraded to provide 3GB—still not anywhere near the recommended 1GB per 1,000 devices. The district is working with the county to install equipment to bring their capacity up to 10GB, and in the process of doing so, Adams has begun exploring the idea of the district becoming its own internet service provider, through a process called self-provisioning, taking connectivity for the entire community out of the hands of third-party service providers like Time

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Warner and Comcast. "If a third-party service provider can provide a low-cost option for my community, I'm willing to work with them," explains Adams. "But the goal is 24/7 access, and we need to find a way to provide that not only at my district, but across the state and the nation."

It's the issue of connectivity that best demonstrates Adams' knack for making the impossible possible. While Adams works to get approval from the state and the Federal Communications

Commission to light up existing dark fiber, which is unused fiber run by electrical or gas utilities, and connect directly to the state network, he is also in contact with the Federal Trade Commission, advocating for the approval to use E-rate money to buy connectivity for students' homes.

In October 2014, the district put their first Wi-Fi-equipped bus in service, allowing students to stay connected during their 40 to 60 minute bus ride. The districts full fleet of 100 buses will be equipped with Wi-Fi within the next 12 months. In addition to providing connectivity on the road, the buses will be

parked in trailer home parks that currently lack internet, providing 24/7 access for those locations.

"Technology plays a huge role in my vision, and if you're not going to give me what I need for my kids," remarks Adams, "I'm going to do it myself. I am not going to deny them their education. My job as a leader is to open the doors that allow the experts on my team do what needs to get done in order to make 24/7 connectivity a reality for our students."

eSN

Jennifer Welch is a contributing writer for eSchool News.



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It's no secret that digital games are wildly popular with both students and adults, but moving them from play time to class time has proved a formidable challenge. With gaming talk everywhere these days, attitudes may finally be changing, at least according to data from Project Tomorrow's Speak Up 2013 survey, which collects responses from hundreds of thousands of students, teachers, and administrators each year. For more on the survey, visit <http://tomorrow.org>.

GAME ON

K-12 students agree that the top benefit to playing online or video games in the classroom is that it makes difficult concepts easier to understand.



7 out of 10 teachers

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56% of librarians

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