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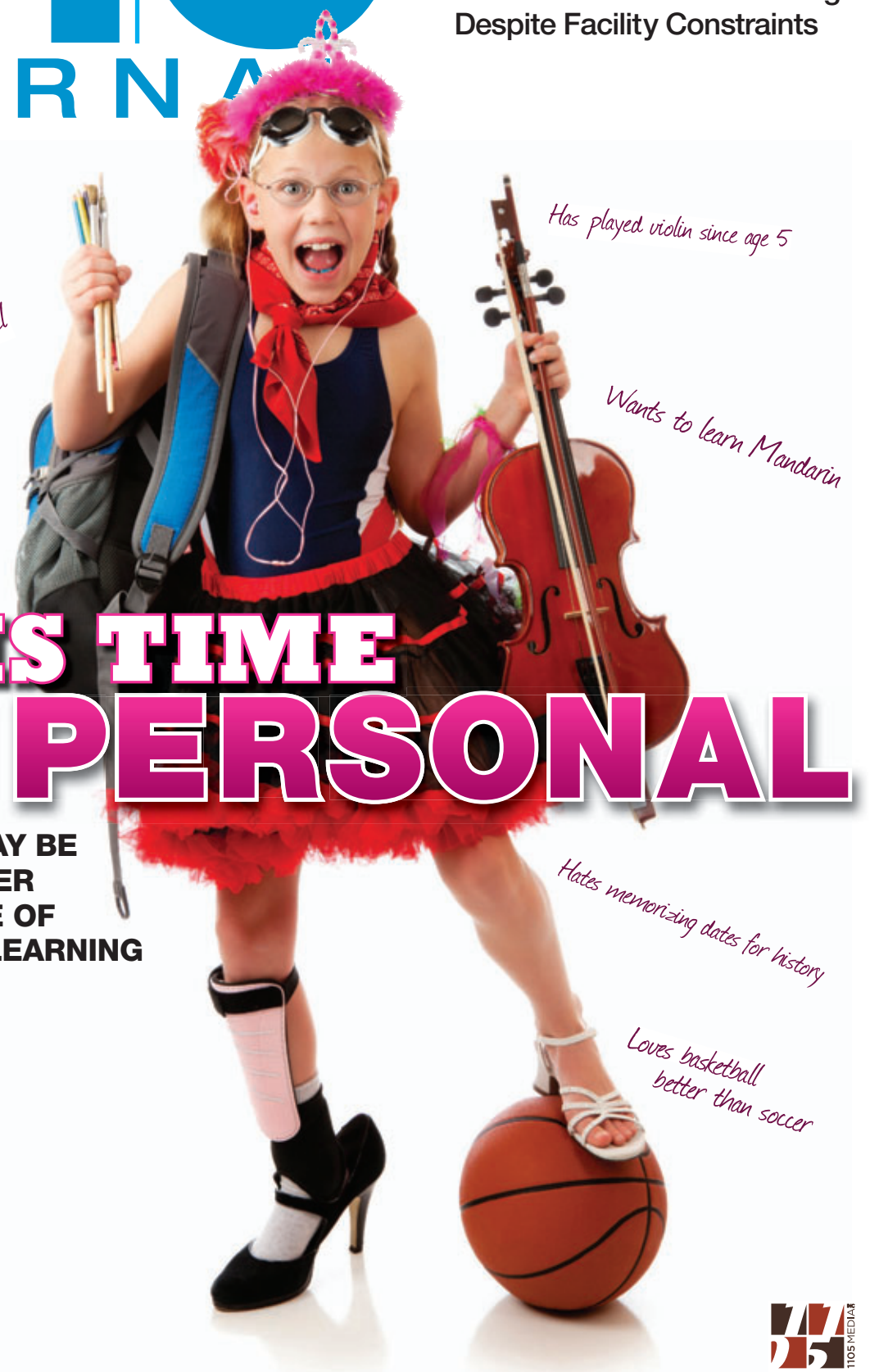

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Therese Mageau, Editorial Director

"Make It Stop!"

The mainstream media's routine, ill-informed attack on educational technology is spinning my head around!

I FEEL LIKE SCREAMING that line from *The Exorcist*: "Mother, make it stop!" Every few years, the mainstream media gets a bee in its bonnet about educational technology and starts running exposés on the following kinds of "scandals": there is no evidence that technology improves student learning; schools make wasteful investments in technology; schools use it in place of flesh-and-blood teachers; private ed tech companies are making money off of public education. If you've been reading *The New York Times* this year, you know what I mean.

I am going to concede all those points:

1) We need more evidence about the impact of technology on student learning. Of course we do! We need more evidence about much of what happens in education. For heaven's sake, we don't even know with scientific assuredness exactly what makes a good teacher, but I don't see anyone questioning the value of teachers. (And PS, there is plenty of evidence on technology's effectiveness. The SIIA has a nice compilation of studies at *siia.net/visionk20/pages/evidence.html*.)

2) Schools need to be more thoughtful when investing in technology. We all know schools that made terrible technology investments because they jumped on a bandwagon; their superintendent got taken out to play golf once too often; some internal evangelist made a case based on passion rather than reason; they had money to spend at the end of the year and they bought the shiniest toy in the store. Now, substitute any significant educational investment (athletics, teacher training, HVAC systems, playground equipment) for educational technology, and you will find schools that made the same kind of impulsive purchase.

The problem isn't technology; it's the way that some schools make investment decisions, period.

3) Schools are using technology in place of teachers. They better be! Do we really want some poor teacher standing in the front of the classroom drilling kids on multiplication tables? Can a teacher instantaneously pinpoint sub-skill problems a child is struggling with, and give him immediate access to targeted instruction? I could name a dozen ways in which the use of technology is better than teachers' precious time. But does that mean that technology will replace the teacher? That's so stupid an idea, it should never rise to the level of public discussion—ever again.

4) Private tech companies are making money off of education. Is this supposed to be a news flash? Who the heck published the McGuffey Reader? Private investment has been around since the beginning of public schooling. Listen, I have some beefs with the investment community and how their dollars can distort the market (which I'll save for another column), but let's not confuse that with legitimate private companies offering good products and services that schools want to buy.

Can we have a Rodney King-like moment and all agree that technology is not the problem? In fact, it's not a problem at all. Like all important educational tools, technology has tremendous potential to help schools do their jobs if they invest in it and use it wisely. I know that's not a headline-grabbing scandal, but it's the truth.

Continue the conversation. E-mail me at *tmageau@1105media.com*.

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[news]

Online Petition Urges More E-Rate Funding

IN A PUSH TO GET the Federal Communications Commission to release more funding for its popular E-Rate program, **Funds For Learning**, a compliance service firm for E-Rate applicants, is circulating an open letter to FCC Chairman Julius Genachowski and an online petition, which has collected nearly 1,000 signatures to date.

Currently, the E-Rate program, also known as the Schools and Libraries Program of the FCC's Universal Service Fund, is capped at $2.29 billion per year, while demand has surged to more than twice that amount. The program helps schools and libraries throughout the country obtain various telecommunications products and services, like high-speed internet access.

In the letter, Funds For Learning CEO John Harrington explains that schools and libraries, especially those in poorer communities, rely on the E-Rate program as "the financial backbone that enables them to keep their sophisticated and expensive telecommunications networks up and running." To supplement the existing budget, Harrington argues for shifting funds from the FCC's Connect America Fund, which aims to extend broadband access across the United States by the end of the decade.

"It makes sense to take funds from the Connect America Fund and to allocate them to the E-Rate program, enough to make the latter a viable solution to the student and community access part of our country's broadband problem," says Harrington. "Allocating funds from the Connect America Fund will not require any new taxes, making it the perfect solution to a serious problem at a very difficult time."

According to Funds For Learning, requests for E-Rate funds have nearly doubled since the program began, from $2.36 billion in 1998 to $4.65 billion from more than 44,000 applicants in 2011. However, until 2009, the available E-Rate funds were capped at $2.25 billion. The cap was indexed for inflation starting the next year, resulting in $2.27 billion and $2.29 billion in available funds for 2010 and 2011, respectively.

Funds For Learning will deliver its petition to the FCC in early 2012. View it at *eratemanager.com/FCCPetition*.

Georgia District Invests in New E-Learning Initiative

STARTING NEXT AUGUST, teachers in **Gwinnett County Public Schools**, Georgia's largest school district, will use web-based software as part of the district's multiyear digital learning initiative called eCLASS (digital Content, Learning, Assessment, and Support System).

The district will partner with **Houghton Mifflin Harcourt** and its Pinpoint e-learning system, which compiles student data, including test scores, and provides teachers with tools that allow them to create personalized learning plans and assessments for students.

The Pinpoint system allows teachers to track students in a streamlined way. Once teachers sign in, they will see their students' names and academic information in a dashboard-style format and will be able to "drill down" to see individual student test results and ideas about how to improve students' weaknesses.

"There exists a critical need for schools to assess the child as a whole, and then develop a comprehensive learning plan that delivers content anytime, anywhere, using a variety of methods and technology," says Gwinnett County Superintendent J. Alvin Wilbanks.

Gwinnett's school board approved the five-year, $9.5 million contract with Houghton Mifflin Harcourt in September. The school district had tested the product in the preceding months.

[industry update]

Blackboard and **NBC Learn** will jointly create an online video series focusing on the use of technology in education, called "Solutions in Action." Hosted by Rehema Ellis, NBC News chief education correspondent, the videos will feature education advocates like Julie Young, founder of Florida Virtual School, and designer Marc Ecko, an education activist. For more information, visit *Blackboard.com* or *NBCLearn.com*.

Microsoft announced the winners of the 2011 Global Forum Educator Awards at a November ceremony in Washington, DC. The awards singled out 18 teachers in six categories who provide innovative teaching practices, imparting students with 21st century skills. Educators from the United States took home three awards, each in a different category: Cutting-edge Use of Microsoft Technology for Learning, Knowledge Building and Critical Thinking, and Collaboration. Winners were selected from more than 115 projects, narrowed down from more than 200,000 applicants. Winners received Intel-powered classmate PCs for their classrooms.

A new survey of more than 1,000 teenagers conducted on behalf of **Intel** has revealed what may be a major stumbling block to encouraging more students to major in engineering once in college. Twenty-nine percent of teens polled did not know of potential job opportunities in engineering and 13 percent did not think that majoring in engineering would lead to greater job opportunities. Fifty-three percent, however, were more likely to consider engineering after learning about the role of engineers in the development of music and video games, and 61 percent were influenced after learning engineers make an average annual income of $75,000. According to a recent study in the journal *Science Education*, the majority of students who study STEM fields in college make the choice to do so while still in high school.

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STEM Video Game Challenge Kicks Off for Second Year

The second annual National STEM Video Game Challenge—a competition to motivate interest in STEM learning among America's youth—is open for entries through March 12. The challenge calls on students to create their own video games for the chance to win a variety of prizes, including laptops and game design software.

Last year's inaugural competition featured more than 600 entries from students, teachers, collegiate developers, and professional digital game makers. This year, the competition has been expanded to include students from middle school through the college level. A new challenge for game-designing educators has also been added.

Middle and high school students can focus on any topic for their games, but are encouraged to create them around science or math. Judges will grade these submissions on gameplay and creative vision.

Winners in these categories will each receive AMD-based laptops, game design software packages, and other tools to support their skill development. There will be a total of $80,000 in prizes for youth and youth sponsoring organizations.

Winners will be announced in May. For more information, visit *stemchallenge.org*. The competition has a number of sponsors, both in the for-profit and nonprofit sectors.

TurfMutt Launches Spruce Up Your School Sweepstakes

Discovery Education and the **Outdoor Power Equipment Institute** have launched the Spruce Up Your School Sweepstakes as part of their TurfMutt program.

The winner of the sweepstakes will receive a $5,000 grant to have its school's playground made more environmentally friendly through the addition of trees, shrubs, and more. Two runners-up will also receive green packs, consisting of TurfMutt merchandise worth approximately $50, for up to 40 students in their classes.

TurfMutt offers classroom resources for fostering an appreciation of the environment and green spaces through investigation, activities, and experiments. It was recently expanded from grades 3 to 5 to kindergarten through the fifth grade. The company's online lessons and resources are designed to get students outside and understand the importance of green spaces by investigating the benefits of landscaping and recycling.

Educators can enter the sweepstakes one time per day until March 1 at *turfmutt.discoveryeducation.com/sweepstakes.cfm*.

[you told us]

Wall Street Is Running the Show

I appreciated your comments in "The TCO of the Best and the Brightest" [Our Space, November/December; *thejournal.com/articles/2011/11/02/the-tco-of-the-best-and-the-brightest.aspx*] regarding the "total cost of ownership" to include the human cost of producing the devices. I would enjoy your writing the second chapter of the story to let readers know why Apple and other manufacturers feel a need to use these sub-human factories to produce their popular products.

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The TCO of the Best and the Brightest

Having talked with Apple's CFO following a call with Wall Street analysts, it's clear that the pressure placed on Apple and other companies to continually increase quarterly and yearly revenue and earnings is a bottom-line contributor to the effect. If Apple generates $45 billion in revenue for the first half of 2010, then Wall Street investors insist it must generate $50 billion in the first half of 2011 or it will be labeled as missing expectations with a subsequent stock devaluation and Wall Street deriding the performance of the company.

So, how to ensure revenue (and profits) continue to grow? Reduce manufacturing cost by as little as 10 cents per device (multiplied by millions of devices). How do you squeeze another 10 cents out? Contract with a factory willing to cut costs in human capital.

While the corporations are not guilt-free in this, it's clear that Wall Street is running more of our society, including education, than most folks are willing to talk about. It would be great if you used your voice to bring that perspective into focus.

—Jim Hirsch, associate superintendent for academic and technology services, Plano Independent School District, Plano TX

2012 Charp Award Nominations Are Now Open

Is your school district using technology in an innovative way to improve educational achievement for all its students—and nobody else knows about it? In that case, there might be an award waiting for you.

Nominations are now being accepted for the 2012 Sylvia Charp Award, given jointly each year by *T.H.E. Journal* and the International Society for Technology in Education (ISTE), to recognize the outstanding districtwide use of innovative technology in K-12 education.

The Sylvia Charp Award is given in honor of its namesake, the founding editor of *T.H.E. Journal*, and her groundbreaking contributions to the education technology community. With this award, *T.H.E. Journal* and ISTE hope to encourage educators to focus on the districtwide implementation of innovative technology to establish progress in education.

"It is so inspiring to see the level of innovation and dedication to excellence among the Sylvia Charp Award nominations," says Therese Mageau, editorial director of *T.H.E. Journal*. "We are looking forward to seeing once again how school districts are using technology to advance educational excellence."

The winning district will receive a $2,000 travel stipend that will enable it to send two representatives to the ISTE 2012 conference, scheduled for June 24-27 in San Diego, where they will be honored and presented with the award. In addition, the district will be recognized for its achievements in both *T.H.E. Journal* and ISTE's membership magazine, *Learning & Leading With Technology*.

Nominations will be accepted through March 1. To submit a nomination and find out more about the award, visit *iste.org/membership/awards-and-recognition.aspx*.

You may also read the accompanying "Charp Award Judges Talk," in which the judges of last year's competition discuss how they decided on their choice for the 2011 Sylvia Charp Award-winning district. Also, to learn more about the 2011 Sylvia Charp Award winner, the Vail School District in Southern Arizona, go to *thejournal.com/shoulder.*

Charp Award Judges Talk

LAST JUNE 26, representatives of the **Vail Unified School District** (AZ) (in photo at right) were at the opening session of the annual meeting of the International Society for Technology in Education (ISTE) in Philadelphia to receive the Sylvia Charp Award, given each year by ISTE and *T.H.E. Journal* to the K-12 district that demonstrates the most innovative use of technology.

The presentation was the culmination of a nearly yearlong selection process. The competition judges, Anita McAnear, ISTE acquisitions editor and program chair, and *T.H.E. Journal* Editorial Director Therese Mageau, spoke shortly after the presentation to Executive Editor Michael Hart about the program and the benefits of a nomination.

What kind of projects or programs should districts consider when they're thinking about nominating themselves for the Charp Award?

THERESE MAGEAU: The applications Anita and I found the most impressive were those where the effort was truly systemic. Some individual programs might have been excellent, but the applications that really impressed us were the ones where a technology-enhanced environment was built into everything they did.

ANITA MCANEAR: Yes, systemic is a key word. With the applications that really stand out, every single component is so well documented and taken into account.

Is there anything in particular that the highest-quality entries have in common?

MAGEAU: A big thing was the superintendent's letter. You could tell right away the districts where the superintendent gets it and the ones where the superintendent doesn't.

The Vail Unified School District won the award last year, but I know there were some excellent candidates that didn't win. Is there anything the best entries you see have in common?

MCANEAR: The thing they have in common is that they have programs that are replicable in other districts and are teacher-driven.

MAGEAU: Yes, the teacher is such a big part of it. With all the best entries, the teachers are deeply involved in the innovation—a lot of the time that's not the way change happens in schools.

Were you surprised that the winning entry last year came from a relatively small rural area rather than from a district in a larger city or suburb?

MAGEAU: Not at all. Some of the most innovative applications were from rural areas. Rural schools have tremendous challenges, and the ways that they have overcome them are instructive to districts everywhere.

There are plenty of awards programs in the world. Why is this award so important?

MCANEAR: Because it's at the district level. It doesn't depend on just that one fantastic teacher, the one who seems to always be able to do anything.

If a district nominated itself last year because it has a great project but didn't win, should it try again this year?

MCANEAR: Oh, yes! A major project is a three- to five-year plan. If they're in year one or two, it's great to enter the contest and start writing about it. Maybe you might not win, but you've got a good start on the next year.

MAGEAU: School districts need to get their stories out there. We will take many of the stories we learn about here and they will show up in the pages of our magazine. You're in a much better position to advocate on your own behalf if you have gone through this exercise. Even when schools aren't winners, they are winners.

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Margo Pierce

Tech Gets Tough on Schoolyard Bullies

With efforts to control and eliminate bullying in schools becoming a more pressing issue all the time, can technology help administrators and teachers who already have a lengthy academic to-do list?

CLASSROOM BEHAVIOR doesn't seem to get much media attention until bullying results in serious injury, a student suicide, or the prosecution of a child as an adult on a murder charge. At that point, forces beyond the school district take over and an educator's worst nightmare turns into public outrage.

Schools are finding that technology can be an important element in making their behavior programs more proactive from an administrative and an instructional perspective. Applications that streamline data collection and analysis and that engage students in positive interactions can affect a school's anti-bullying efforts.

The challenge is matching behavioral objectives with the right technology. To leaders in the **Dallas Independent School District** (TX), the goal was getting better at identifying effective points of intervention, perhaps even before an actual bullying incident could take place.

"You don't go from being a model student to ending up in a DAEP [disciplinary alternative education program]," says Suzie Fagg, executive director of student services for the Dallas ISD. "This is a progression, and when you've got technology, it's easier to see that progression and intervene."

Describing her district's Student Welfare Freedom From Bullying plan as "one of the most comprehensive anti-bullying policies in the country," Fagg says the effort is directed at preventing and reducing acts of bullying before they ever have the chance to get out of hand. Dallas ISD already collected reports on bullying incidents, but the data were disparate, not allowing for the kind of analysis Fagg believes will help schools identify problem areas.

"All of the data, when you take it together and look at trends, that is what your school environment is all about," Fagg says. "If you have a lot of incidents of bullying going on and you know that a lot of it's happening [for instance] on this stairwell, then you need to begin to address the issue of that stairwell. How can you deploy staff there? How do you educate staff about what they need to be looking for?"

Real-Time Data

To implement her anti-bullying policy, Fagg turned to Review360, a hosted software program that helps educators collect relevant data and improve student behavior. The data collection begins with a customized incident-reporting form that matches the process educators were already using at Dallas ISD, but a host of pull-down boxes were added to the online form to ensure consistency of incident description and streamline reporting. The form standardizes the language used to describe behavior, eliminating the need to interpret subjective language—making the data easier to take action on.

"We have an office of student discipline, so they collect discipline reports. But unless you act on those reports, they're just numbers," Fagg says. "It's about using the referrals and the data from those referrals to maybe improve on the operation of our schools, as well as the relationships between our students and our staff."

Fagg sees the new technology as a way to intervene at the very outset rather than after the fact. "If it's a paper referral, you stick it in a folder," she says, "but if we can see [real-

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time] data on this student and say, 'This student hasn't acted out at all, and now all of a sudden we're seeing these referrals come through,' then we need to intervene before it's too late."

"We know what works with kids with behavioral problems," says Stewart Pisecco, a behavioral psychologist and the creator of Review360. "Our biggest challenge isn't coming up with what works, but rather how to get what works implemented consistently throughout the school."

An interactive planning process helps teachers develop classroom management goals and materials to achieve desired outcomes.

Administrators can track teachers to see who has completed which modules and monitor the progress they are making toward their classroom behavior objectives.

"Combining the content with the data makes it possible to see which areas of the training are being implemented well and achieving the desired result," Pisecco adds.

One reason Review360 was particularly attractive to Dallas ISD was the relatively low cost. Traditional face-to-face teacher training for more than 200 teachers, coupled with regular refresher courses, could have been astronomical.

Modeling Behavior

When looking at anti-bullying initiatives, the targets of bullying and bystanders need to be considered at least as much as the bullies themselves.

"Bullying is not new to teachers, and especially not to special ed teachers. At our schools, we do tend to collect the so-called bullies and their targets and many of the bystanders—that's who we teach," says Marge Krah, social skills and character education teacher for the **Cape May County Special Services School District** (NJ).

Krah is one of the nearly 110,000 New Jersey teachers working to implement legislation enacted this year that includes an "anti-bullying bill of rights" and mandates that public schools not only reduce bullying, but provide evidence that efforts are made to help children change behavior in order to prevent the behavior. Ripple Effects, a behavior software program, is one of the tools New Jersey districts are using. The program includes hundreds of video clips of real students telling their stories about a host of negative behaviors.

Linda Bruene Butler, a clinician administrator with the University of Medicine and Dentistry of New Jersey, was hired as a consultant by the Cape May district to help the schools teach anti-bullying behavior. Bruene Butler, who became a Ripple Effects trainer to assist educators in this process, says she's utilizing a curriculum she helped coauthor and supporting that effort with the Ripple Effects software.

Schools are finding that technology can help make their behavior programs more effective from both an instructional and administrative perspective.

Adding a new curriculum that teaches students behavior skills to an already jam-packed school schedule is a challenge that Bruene Butler believes administrators and educators want to meet but find difficult to accomplish. That's where the technology comes in.

Once Ripple Effects is downloaded to a school network, it offers two kinds of behavior instruction: tutorials for teachers about how to teach lessons on behaviors or successfully remediate poor behavior, and tutorials for students that address more than 300 behavior-related topics.

With the student component, the interactive programs allow users to create individualized profiles.

"Our kids already have, by the nature of their classification and getting sent to a school district outside their neighborhood, significant self-esteem problems," Krah says. "This software with teenagers or kids who are very relatable to them makes them say, 'Hey, I'm not the only one that's dealing with this.'"

After logging on, a student will follow a set of lessons chosen by a teacher or counselor to address a specific behavior problem. The students also can choose the topics themselves. A general overview, videos of real kids describing in their own words their experiences or modeling behaviors, and other activities, such as journaling, teach and reinforce appropriate behavior.

Bruene Butler adds, "Hearing kids their age talk to them about bullying and how to identify it, how to identify yourself as a bully or a target or a bystander, is a great way to teach that in a motivating way."

The software can respond to the teachable moment in a way that teachers can't because they have so many other responsibilities in the classroom. At the end of a tutorial, a student can print a strengths-based behavior assessment with suggestions for how he or she can modify behavior to achieve positive outcomes. In addition to accessing information about the performance of specific students, educators can also compile data into reports that aggregate data for the entire student body.

"What's great about the tests in Ripple Effects is that students get immediate positive or corrective feedback on anything that they do," Bruene Butler says. "That's something a teacher would love to be able to do for everybody in the group, but it's beyond the capacity." the

Margo Pierce is a Cincinnati-based freelance writer.

LINKS

- **Review360**
  psiwaresolutions.com
- **Ripple Effects**
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Geoffrey H. Fletcher

The Water Bed Effect in K-12 Education

As schools become increasingly digital, the arising challenges cannot easily be dealt with one at a time. The interlocking nature of the issues makes the close observer feel like he or she is still bouncing around on a 1970s icon.

WATER BEDS, first introduced in the 19th century to guard against bedsores, grew to be wildly popular in the 1970s. Since then, however, be it because of leaks sprung by zippers and other sharp objects, or floors cracking under their weight, the popularity of water beds has waned significantly, along with bell bottoms, paisley (and my hairline). The old-fashioned water bed does, however, provide a useful metaphor for the use of technology in education today.

Let's start with a very simple physics exercise: Look at the reactions of a water bed and a feather bed to a singular thrust on one corner. Only the corner of the feather bed that received the impact and its immediately surrounding area responds. On the other hand, waves emanate from the impacted corner of the water bed, travel across the entire surface to all other areas of the bed, and push every boundary. In short, the entire water bed is affected.

The concept of interconnectedness is nothing new to systems thinking, but its application to technology and education is a relatively recent phenomenon—and not a moment too soon, because there is a series of interlocking reform waves moving through our education system, all spurred on by technology.

Shaw Nielsen

- First, we have a content shift from print to digital taking place.
- Then there is the shift from print to digital in assessment.
- Next, a move from print to digital in professional development is also in play.
- Finally, underlying all these efforts is a technology infrastructure that is changing quicker than any reform.

It is as if each of these elements were pushing down on its own corner of the water bed. Unfortunately, in too many circumstances, we in education are planning and acting as if we are pushing on the four corners of a feather bed, all the while different elements are pushing at their own corners of the water bed, creating waves that crash into one another.

The Shift in Content

The shift from print to digital in textbooks has been well-documented, with more than a dozen states changing policies or launching initiatives that encourage the use of digital content and, in some cases, open educational resources. Momentum for these changes will continue to grow with the implementation of the Common Core Standards in most states. These efforts present challenges.

The first challenge has to do with the way content is organized—or not. In the digital world, the meta-tagging of content (by assigning a symbol or tag to connect content to a common keyword or knowledgebase such as the Common Core State Standards) is crucial. Absent that common code and meta-tagging to it, the advantages of having Common Core State Standards are diminished.

Another challenge is the vetting of content to ensure it is accurate and appropriate for a specific set of students. How is that process replicated when there is so much content now available? And how do you maintain standards of accuracy and appropriateness with digital textbooks continuously updated?

The Shift in Assessment

The proliferation of clickers and various forms of online formative assessments have shown the power and potential of immediate

feedback. Likewise with all the data that can be manipulated easily to analyze how well students are learning.

Most of these assessments, however, are the equivalent of bubbling in answers—that is, they are mostly multiple choice. New assessments slated to be delivered online in the 2014-15 school year are supposed to take greater advantage of technology.

If these new assessments will ask students to demonstrate knowledge and skill in computer-based simulations, the students need to have instruction and learning experiences similar to that prior to the assessment. Unfortunately, at this time, that kind of instruction is not within the ken of many of our teachers.

Professional Development

Schools have been much slower to adopt the use of internet-based materials for professional development than they have for student instruction. Teachers continue to remain most comfortable with face-to-face professional learning experiences. But face-to-face is expensive, and research shows that one-day workshops do not change teacher behavior in the classroom all that much.

However, if educators have ongoing access to the internet, they have a variety of new resources available to them.

But how do we move people from face-to-face to online and encourage online communities of practice? What are some alternative ways, besides seat time, to reward teachers for participating in and applying what is learned in professional development?

Technology Infrastructure

The advent of smartphones and tablets, accompanied by more liberal policies that allow students and teachers to bring their own devices to school, significantly increases access to digital content. But is there sufficient bandwidth to support this access?

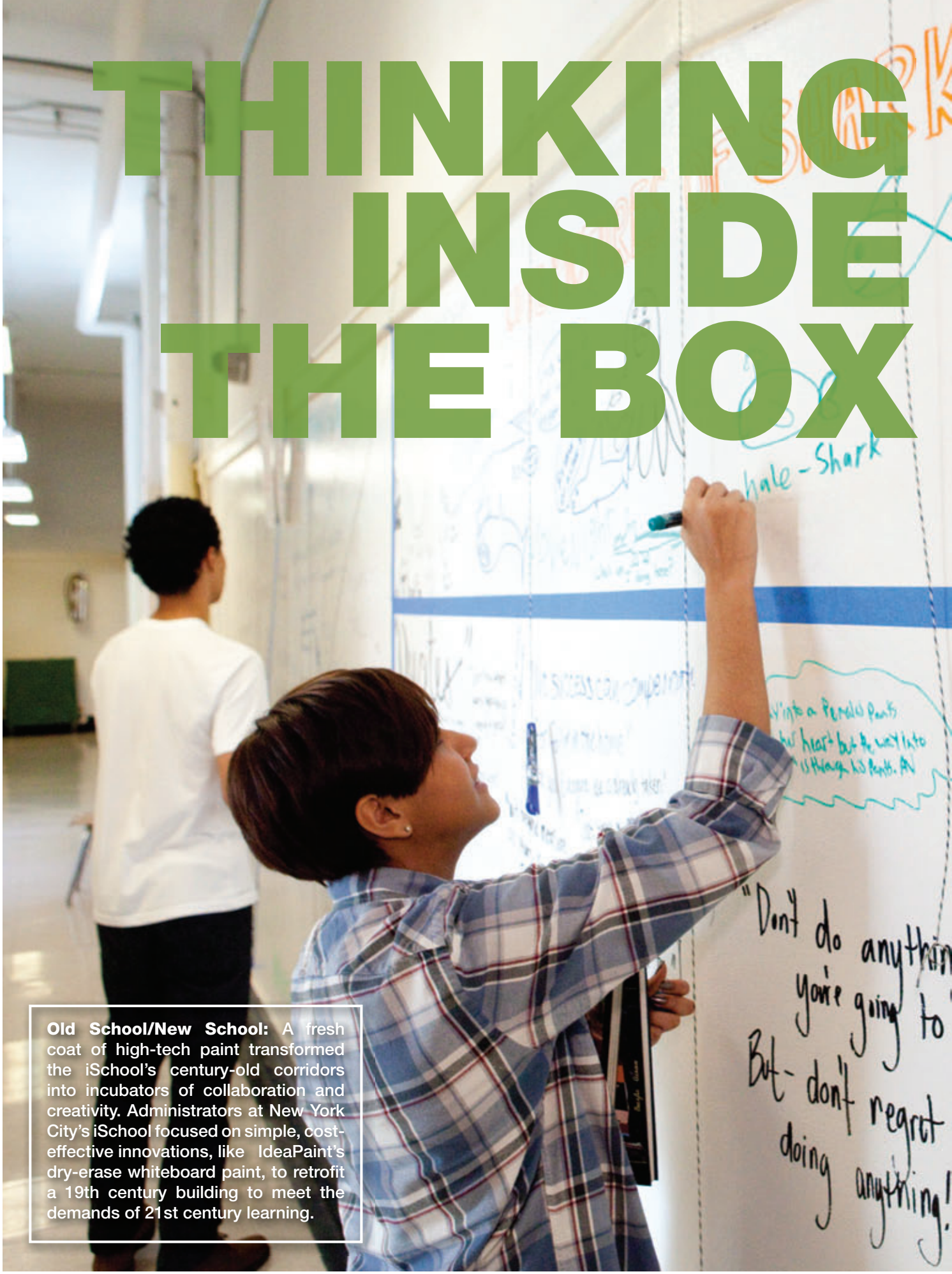
Different types of technology in use in the classroom can create both equity and management concerns for teachers that could get in the way of actual learning. How do we ensure that students have access to sufficient technology and bandwidth outside of school? How do we ensure that teachers and administrators will access and use the available databases linking the digital content with the assessment with the student information system?

I will attempt to address these questions in future columns over the coming year.

Reviving once more the water bed metaphor, what seems clear is that answering one question may only result in more questions. Remember the water bed. Feel the wave. the

Geoffrey H. Fletcher is the senior director of strategic initiatives and communications for the State Educational Technology Directors Association.

THINKING INSIDE THE BOX



Old School/New School: A fresh coat of high-tech paint transformed the iSchool's century-old corridors into incubators of collaboration and creativity. Administrators at New York City's iSchool focused on simple, cost-effective innovations, like IdeaPaint's dry-erase whiteboard paint, to retrofit a 19th century building to meet the demands of 21st century learning.

The reliance on technology and digital tools in iSchool classrooms, like MacBook Pro laptops, GarageBand software, and midi keyboards in the music room, allows the iSchool to offer an expansive, individualized curriculum to 400 students in limited space. By Jennifer Demski

WHEN WE THINK OF 21st century schools, we think of geometric modern architecture, sustainable building materials, and high-tech modular classrooms. It's rare, though, that a district has the space or the money to build that school from the ground up. Instead, the challenge for most is the transformation of 20th century architecture to support a 21st century model of learning.

When iSchool Co-Principals Alisa Berger and Mary Moss were tapped by the New York City Department of Education to create a new high school whose curriculum incorporated technology and challenge-based learning modules, a 20th century building would have been a luxury. Yet, on the top two floors of a school built at the end of the 19th century in Manhattan's SoHo, they worked within the building's century-old limitations to develop a scalable model that rethinks what high school looks like in the 21st century.

The key was ensuring a truly robust online environment and working with the constraints of the building rather than against them.

Big Band: There may only be space for a drum set and a piano, but students in a music composition class have access to every instrument they need, right on their laptops.

Photos by Tom Sobolik

THE CREATIVE COMMONS: This multi-purpose space was modeled after the modern college library, which is no longer a quiet space but instead a hub of collaborative learning.

PUBLIC SPACE: "Learning is very public," explains iSchool Principal Alisa Berger. "The Creative Commons is the area where teachers can send small groups of students to work on a project. If a teacher wants to have a one-on-one meeting with a student or a curriculum designer, it would happen right here."

SHAPE-SHIFTER: Modular furniture allows this space to take on a number of roles throughout the day. Above, students in a drama class look on as their classmates rehearse for a production of *King Lear*. An hour later, the room is transformed into a cafeteria where 300 students will eat their lunch. Between the large multimedia displays on the wall at the left is a Cisco webcam that will be used for a large-group videoconference for many students at the end of the school day.

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OPENING KEYNOTE

W. GARDNER CAMPBELL, PHD
Director, Professional Development and Innovative Initiatives, Division of Learning Technologies, and Associate Professor of English
–Virginia Polytechnic Institute and State University

SCHOOLERS AND YEARNERS: LEARNING IN THE DIGITAL AGE

WEDNESDAY KEYNOTE

MICHAEL WESCH
Associate Professor of Cultural Anthropology
–Kansas State University

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POWERHOUSES: The Creative Commons also features three high-end desktop computers for students whose schoolwork requires the use of resource-hungry software or the transfer of large files over the school's network. All three of the stations are designed to seat multiple students around each machine; the large displays make it easy for small groups of students to collaborate on photo and design assignments.

A ROOM WITH A VIEW: In the iSchool's distance learning classroom, students take a number of advanced placement courses taught by teachers elsewhere in the NYC school system. At right, an AP Chemistry teacher in the Bronx teaches iSchool students via a Cisco videoconferencing system, which iSchool technology coordinator Curtis Borg refers to as an "extraordinary" piece of equipment, but perhaps not as extraordinary as the oaken science file drawers which sits under it—and which is part of the building's century-long history.

ADAPTATION: Rather than install a new equipment rack, Borg and his team transformed the classroom's original coat closet into a secure, ventilated home for the Cisco videoconferencing system's remote-controlled web camera.

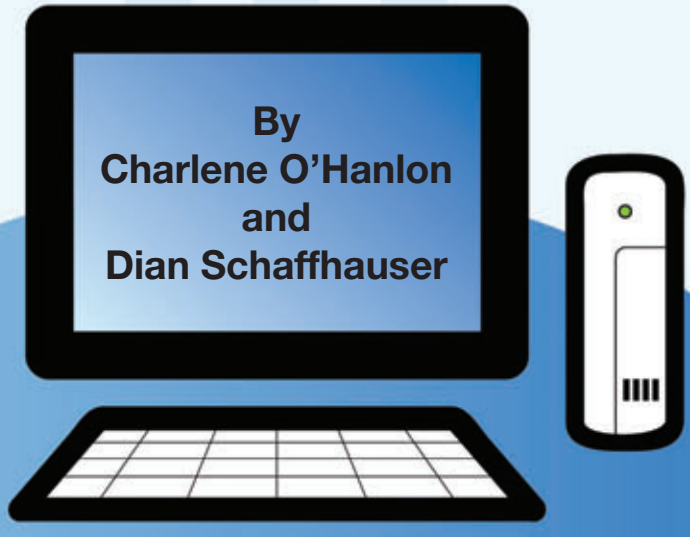
KEEPING QUIET: Like the Creative Commons, the Quiet Commons is a multipurpose space designed to facilitate 21st century learning in a building that was erected in the 19th century. Any collaboration that takes place in this quiet space, though, is happening on the web in individualized online coursework. Otherwise, the cubbies are good places for students to work independently on their assignments and projects.

A TIME FOR TECH: Students participating in a challenge-based learning module collaborate on the development of an interactive play based on *Othello*. Each classroom features a whiteboard, projector, and 30 laptops on which students access their virtual desktops. During their time in the Quiet Commons, students can check out laptops, graphing calculators, and headsets for online coursework.

WE ARE SIXTEEN: The module, designed by iSchool teachers, explores global and anthropological perspectives on what it means to be 16 years old. Students hold video conferences with teens around the world and, this year, students are collecting footage on Flip cameras for a documentary they are collaborating on. the

Jennifer Demski is a freelance writer who is based in Brooklyn, NY.

DIVING into the cloud



By
Charlene O'Hanlon
and
Dian Schaffhauser

One of the most misunderstood concepts in educational technology at the moment is cloud computing. In a two-part series, *T.H.E. Journal* offers an in-depth guide to help you decide if cloud-based services are right for your school district. The second part of the series, which focuses on the business case for the cloud, is available at *thejournal.com/cloudstory.*

Is it any wonder that the forecast is calling for cloud? It's a perfect storm out there, with powerful forces remaking the IT landscape in education. On one side, devastating budget cuts are pushing IT departments to identify ever-greater cost savings. On the other, the explosion in mobile devices is pressuring IT to provide anytime-anywhere computing with no downtime. And finally there's data — a flood of never-ending data — that need to be stored and analyzed.

Implemented correctly, the cloud can help school districts tackle all of these issues. It promises to allow IT departments to support their institutions faster and more cheaply. But the term itself has become so abused that most people have no idea what "the cloud" means anymore. Right now, it's more like a thick fog.

In this two-part series, *T.H.E. Journal* hopes to lift that fog and help IT administrators — and their constituents — understand the cloud, and what it can do to help districts ride out the storms buffeting their schools.

WHAT IS THE CLOUD?

The easiest way to understand the cloud is to think of it as a utility, like electricity. When you plug a device into a wall outlet, electricity flows. You didn't generate the electricity yourself. In fact, you probably have no idea where the electricity was generated. It's just there when you want it. And all you care about is that your device works.

Cloud computing works on the same principle. Through a network connection (the equivalent of an electrical outlet), you can access whatever applications, files, or data you have opted to store in the cloud—anytime, anywhere, from any device. How it gets to you and where it's stored are not your concern (well, for most people it's not).

The potential benefits of such a system are enormous. To stick with the electricity analogy, if your IT department is still pre-cloud, it's running the equivalent of its own generator. And with that comes a load of responsibility: Generators break, run out of fuel, need to be serviced, and—if demand for power increases—new ones need to be bought.

The cloud frees IT from the tech equivalent of all that. Because, just like power companies, cloud providers are the ones who are responsible for all maintenance, infrastructure, and repair. *They* are responsible for meeting demand, and ensuring that service is reliable.

WHAT IS A THIN CLIENT?

A thin client is a computer or software program that can only work in a networked (or cloud) environment, because it relies on a more powerful computer to do most of the processing work. It's got enough oomph to start up, but after that it looks to its bigger friend for everything else. Think of it as a politically correct term for what used to be called a dumb terminal.

The analogy to electricity is a little simplistic, because cloud computing actually represents more than one type of service. Indeed, it might be more appropriate to compare cloud computing to *all* the utilities hooked up to your house: electricity, water, and gas. In the case of cloud computing, there are three basic types of service: software as a service (SaaS); infrastructure as a service (IaaS); and platform as a service (PaaS). PaaS is not used much in K-12 districts, so we will not describe it in detail.

Software as a Service

Ever used Gmail? How about Yahoo Mail? If so, you've used software as a service. In fact, many school districts have been using the cloud for a long time without ever quite realizing it. For some reason, web-based applications like these haven't registered with most people as being "cloud." Only when applications like Google Docs replace software that has traditionally been locked inside the PC do people seem to realize it has something to do with the cloud angle.

Quite simply, SaaS is a software application that is hosted in a central location and delivered via a web browser, app, or other thin client (see box). Rather than having to purchase and install the application on individual computers, a school simply pays a monthly subscription fee to a service provider. Users—whether students or employees—just log on to access the application.

To the end user, the experience is exactly the same as if the application were installed on the user's hard drive or the district's internal network. By having the application delivered as a service, however, students can work on assignments from any location; HR managers can do payroll from the comfort of their living rooms; teachers can work on lesson plans after hours. What's more, users can use different devices without having to tote around thumb drives to transfer information, since the project is all stored in the cloud.

And, from an IT perspective, there's a beautiful upside: No longer do you have to update software on machines scattered throughout your schools. No more patches, no databases tracking installs and software updates. And the nightmare of keeping track of software licenses? Gone.

Most often, SaaS is associated with business applications such as accounting, customer relationship management, and human resource management, but more consumer-focused applications are coming online all the time. Google paved the way with its popular Google Apps for Education, which has been adopted as the de facto business productivity suite by a number of school districts.

In late June, Microsoft rolled out Microsoft Office 365, which includes a cloud-based version of its popular Office suite, in addition to its Exchange e-mail and SharePoint collaboration application. Although the cloud-based offering is not yet available for the education market, Microsoft does offer a very similar suite of tools via the cloud through its popular Live@edu service. At some point, the company does plan to transition Live@edu to the Office 365 platform, although a date for its full introduction has not yet been set.

WHAT THE CLOUD CAN DO FOR YOU

ROBUST RESILIENCY AND DATA RECOVERY

Let's start with the resiliency and data recovery attainable through the use of redundant systems and off-site backup. A couple of years ago the only servers residing in the data center for the **Saginaw Intermediate School District** (SISD) in Michigan were those belonging to the regional service center. Now with a private cloud, the data center is running 80 virtual servers, only 32 of which belong to the district.

The remaining servers are accessed by other districts served by the SISD that found advantages in relinquishing physical control of their boxes. The SISD has a generator backup, which the districts didn't. It also has a mirror site located at one of its larger client districts, which provides off-site redundancy. "That has caught on like wildfire in a two-year span," says Jeff Johnson, the SISD's director of technical services.

The migration began when the district put in its first storage area network and began using virtualization to consolidate its servers for better management of services. That led to the ability for the SISD to sell disk storage space to its client districts. Eventually, that shifted to hosting of server operations too.

"By our hosting, they're not losing anything," Johnson notes. "They're not losing control, computing power, or any of those things. But they're gaining all the benefits of our data center redundancy, our generator, and our backup systems. And we're sharing costs on all of that now instead of everybody trying to do it on their own."

Infrastructure as a Service

Think of IaaS as an outsourced data center with benefits. And limitless capacity. Storage, hardware, servers, and networking are all owned by a third-party provider that is responsible for the maintenance, operations, and housing.

Billing is handled monthly using the utility model (remember the electricity analogy?). Just as the electric company has a meter on your house to measure usage, cloud providers meter your computing usage—and you pay only for what you use. So, instead of buying a server that might run at 15-percent capacity, for example, you pay only for the 15 percent you use.

This pay-as-you-go model can provide a tremendous cost advantage for school districts, which see demand for computing power wax and wane over time. Instead of buying, maintaining, and housing servers to meet those periods of peak demand, schools can use the cloud to scale up or down as needed, without the need to purchase any hardware themselves. It's more efficient.

In the K-12 space, IaaS hasn't caught on as quickly as it has in higher ed, simply because most school districts haven't needed the on-demand computing power that IaaS provides. However, as more districts find themselves needing to update their infrastructure to meet the goals of 21st century learning, IaaS may emerge as a way to shift their infrastructure upgrade from the capital expenses column to operating expenses.

Platform as a Service

PaaS is a term used to describe a software-development platform that is stored in the cloud and can be accessed via a web browser. It makes a variety of programming languages, operating systems, and tools available to developers, saving them the cost of purchasing and installing everything themselves.

It's important to understand that each development platform is different. If an institution develops its application on a closed PaaS platform, there is a danger of vendor lock-in, since it may not be easy to migrate to a different platform.

KNOW YOUR CLOUDS

Just as there are all kinds of real clouds—stratus, cirrus, cumulus—there are different types of computing clouds. The three primary cloud types are public, private, and hybrid. The most appropriate cloud for your district will depend on several factors: What services you want to take to the cloud; your district's comfort level from a

security standpoint; the existing infrastructure; and privacy regulations that may dictate how data is secured.

Public Cloud

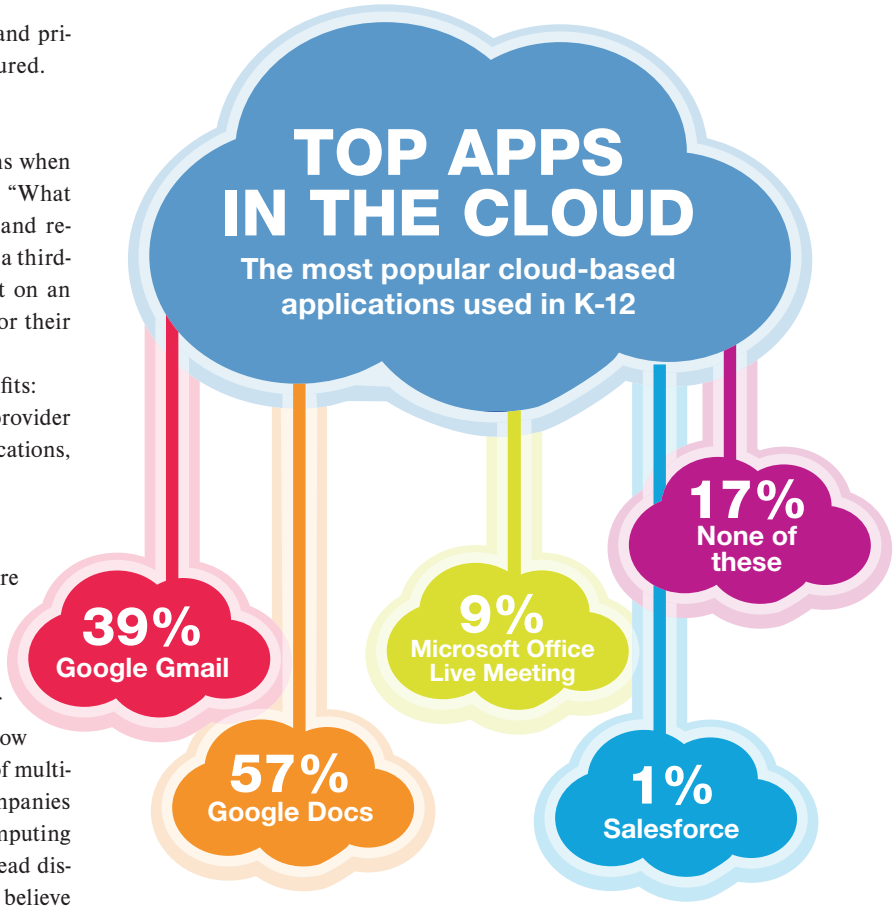
A public cloud is essentially what everyone means when they talk about "the cloud." As we discussed in "What Is the Cloud?" the infrastructure, applications, and resources are housed off-site in a location hosted by a third-party provider. Data is accessed via the internet on an on-demand basis, and users are billed monthly for their use of the resources within the public cloud.

The public cloud model has a number of benefits:

- Simple and inexpensive setup (the service provider incurs the complete cost of the hardware, applications, and bandwidth)
- On-demand scalability
- Users pay only for the resources they use

Because it is a public cloud, however, there are also some notable drawbacks, including:

- Greater risk of security breaches than with other cloud models. The business model of a public cloud is essentially based on economies of scale. It's what allows cloud providers to charge low prices. For that to happen, most pursue a policy of multi-tenancy. In other words, the data of lots of companies and organizations will be stored in the same computing environment as yours. Although there is widespread disagreement about the risks involved, some people believe multi-tenancy increases the ultimate chance of breaches or accidental leakage.
- A perceived lack of control over data. Since the data is housed off-site and in someone else's hands, schools don't have physical possession of their own information, which makes some administrators nervous. And if the cloud provider's system goes down, so too does your information, although the uptime of most cloud providers exceeds that of almost every in-house operation.
- Possible slow data transfer rates. Since public clouds use internet connections, the ISP controls the data transfer rate. School districts that want to use the cloud to store and transfer large amounts of data (high-definition security video, for example) may want to use a private cloud instead.
- A number of school districts are adopting software-as-a-service (SaaS) applications such as Google Apps that



Source: CDW-G 2011 Cloud Computing Tracking Poll

ONLINE EXCLUSIVE:
For links to the schools, organizations, and vendors mentioned in this article, please go to *thejournal.com/0112_cloud*.

WHAT THE CLOUD CAN DO FOR YOU

NO MORE EQUIPMENT BAGGAGE

Cloud computing offers a heady dose of freedom regarding equipment and vendors. "We're an extremely small school. We don't have the bandwidth or the desire to have our own servers," explains **Minnesota Online High School** Executive Director Ned Zimmerman-Bence. "Everything we do is hosted off-site. Our [learning management system] is hosted with Blackboard. Our student information system is hosted with Infinite Campus. Our SharePoint system is hosted out."

That provides definite operational advantages. "Because we're not investing in our own hardware, we're not locking ourselves into a specific operating system or having to constantly upgrade and maintain and patch our equipment," Carsello adds.

In the traditional approach, moving from one vendor to another might require writing off software or hardware that's been purchased or time invested in configuring the system. By choosing cloud-based services, the school can cut its losses more quickly and be selective about its service providers. "If we don't like them, we can say, 'Okay, we're done with you; we're moving to the next one.'"

WHAT THE CLOUD CAN DO FOR YOU

SIMPLIFIED SCALABILITY

Cloud computing offers a measure of simplified scalability to respond to changes in computing demand. The vision is that, as a school expands or shrinks its user base, so too can it crank up or wind down its subscription-based licensing. For example, the year-old **Coleman Tech Charter High School** in San Diego expects to grow from 50 students in its first year to 480 by the 2014-2015 school year. That growth can easily be handled by the cloud-based systems in use, says Assistant Principal Neil McCurdy.

In fact, he's so confident that cloud-based services can do the heavy lifting, the school has no intentions of hiring an IT professional. McCurdy, a Ph.D. in computer science, will handle the bulk of IT needs; and what he can't cover, a student IT team will take care of. That includes helping other students figure out why they can't access the internet, salvaging data from computers before they're sent off for repair by swapping out hard drives, and other straightforward forms of troubleshooting.

Where an IT pro might come in handy, McCurdy is creating ways to automate the work. For example, to provision services for new users, a staff person can enter student or staff information into a Google spreadsheet that's shared by everyone who needs access to it, and that activity "automatically creates the user in the system and gives them their Google Docs account," he says.

86% OF K-12 CLOUD USERS HAVE REDUCED THE COST OF APPLICATIONS MOVED TO THE CLOUD, WITH AN AVERAGE SAVINGS OF 28%.

Source: CDW-G 2011 Cloud Computing Tracking Poll

WHAT THE CLOUD CAN DO FOR YOU

ANYWHERE COMPUTING

There's "anywhere computing." Users simply open a browser window and start working. That's how the **Minnesota Online High School**, which has between 250 and 300 students, operates. According to systems engineer Sarah Carsello, the sole IT person on staff, "We're completely, 100-percent mobile. You can set up camp in an airport. If you wanted to go on the road and stop off at a rest area—anywhere there's internet—you can work."

continued from page 29

live in the public cloud. Other school districts are using the public cloud to store and access nonsensitive data such as student assignments.

Private Cloud

For school districts that don't want to surrender their data to what some perceive as the Wild West of public clouds, private clouds have emerged as an alternative. They can be managed by the school's IT group or by a third-party provider, and they can be located either on- or off-site. In short, they offer the simplicity, flexibility, and elasticity of the cloud-computing model but for a single organization.

Sounds like a data center, right? Yes, but the way it's set up is different. In a private cloud, virtualization of applications and resources is key. Through virtualization, private clouds offer easy scalability, flexible resource management (such as on-the-fly provisioning), and the most efficient use of the hardware. Other technologies work in tandem with virtualization, such as data center automation to help with auto-provisioning of servers and identity-based security to ensure that only authorized users have access.

Private clouds are an attractive option for districts that already have a properly functioning data center. In such cases, repurposing the data center can make a lot more sense than throwing it all out in favor of a move to a public cloud. If you decide to keep it in-house, though, just remember that IT is still on the hook for all maintenance and infrastructure.

Private clouds will also appeal to districts that worry that the public cloud may jeopardize their compliance with state and federal regulations, including the Family Educational Rights and Privacy Act, the Health Insurance Portability and Accountability Act, and the Americans With Disabilities Act.

In K-12, private clouds are emerging as a way for school districts to manage heavy data loads while avoiding off-site storage costs. Additionally, a growing number of districts that provide computer-based learning are seeing the benefits of having their Windows, web, and hosted applications live in a central environment rather than on individual computers, because it offers secure access to the information from any location.

For example, the **Florence Unified School District** (AZ) is furthering its 1-to-1 computing efforts by centralizing its applications in a private cloud and providing access via the internet through an encrypted session to a virtual web desktop. The district worked with Dell and Stoneware, a private cloud software vendor, to develop the environment.

Hybrid Cloud

For schools wanting the best of both worlds, there's the hybrid cloud. Hybrids are a combination of public and private clouds that offers the benefits of multiple deployment models. For example, an organization can couple its current on-premises hardware with cloud-based infrastructure that's scalable and provisioned on demand, then place its applications and data on the best platforms and span the processing between the two.

It also gives schools a way to address the whole security and privacy issue. You keep sensitive data—like student information—in the private cloud, while using the public cloud for less-important stuff.

WEATHERING THE THUNDERCLOUDS

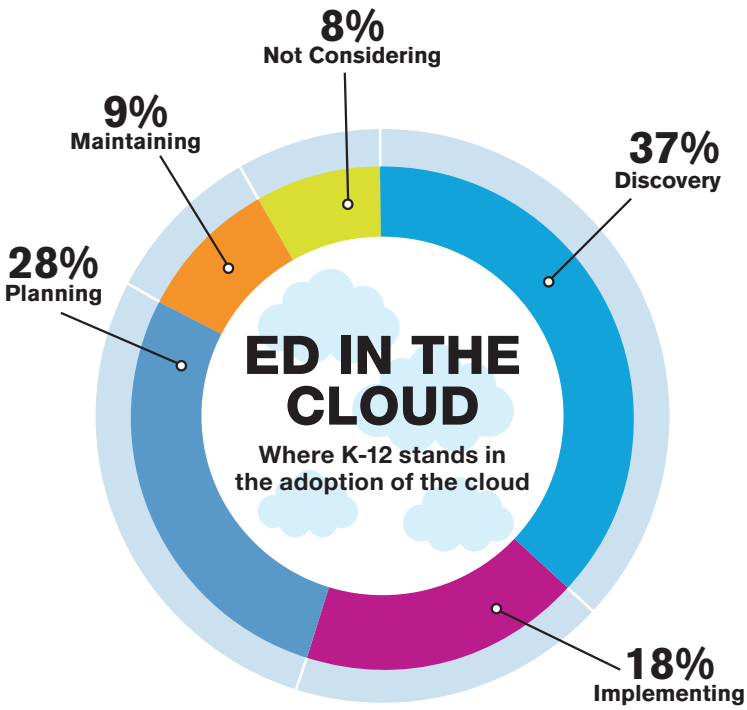
Of course, every great love is bound to have rainy days, and cloud computing is no different. With a few exceptions, cloud-based application vendors tend to roll out updates to their services on a timeline of their own making. As Sarah Carsello, **Minnesota Online High School**'s systems engineer, points out, while that philosophy keeps her school on top of the latest releases of its critical software, there's "an immense learning curve with constantly being on top of the new things that are available."

Also, users need to get used to trusting that their data is safe online. When it comes to backups, "People want to have that document on their own flash drive," explains Neil McCurdy, assistant principal at **Coleman Tech Charter High School** in San Diego. "They want to be making copies themselves." As he points out, "The data is a lot safer on Google, because it's distributed and they've got people making sure there are backups."

It doesn't help that service outages take place even with cloud operations. While years of practice have helped IT people develop processes to follow in the event of down IT systems in the data center, they're still learning what to do when a major cloud-based service goes down, as Microsoft's Live@edu recently did.

"All of their data centers went down in North America," Carsello says. "We lost e-mail. We lost all of those services that we're so reliant on. And we didn't know how to communicate this to everybody, because the primary way we do that is through e-mail." As a result, she added, her school will need to develop processes to follow when a service goes down. the

Dian Schaffhauser is a senior contributing editor of *T.H.E. Journal*. **Charlene O'Hanlon**, based in New York, specializes in technology reporting.



Source: CDW-G 2011 Cloud Computing Tracking Poll

WHAT THE CLOUD CAN DO FOR YOU

EFFORTLESS ANALYTICS AND MONITORING

Sarah Carsello, **Minnesota Online High School**'s systems engineer, notes that services delivered by the web from a third-party company can act as a monitor to deliver analytics that are vital to administrators—or simply to find out whether a student is being honest or not. Blackboard Learn, the school's LMS, which is hosted by the vendor, delivers crucial metrics to ensure that students are doing their work and that they're "attending" school (albeit online). "If they're not, they can't be a student anymore," Carsello states.

Likewise, if a student fusses that he or she can't finish an assignment because the math software wasn't accessible, Carsello can log into a utility to see if the student has been pinging the school's DNS server or not. "We have a couple of different ways to see if they're telling the truth and really experiencing a technical issue," she says.

NOW AVAILABLE ONLINE

In the second installment of our two-part series, available now at *thejournal.com*, we take a look at the critical issues facing every school considering a move to the cloud, including:

- Does it make business sense?
- Security
- Contracts
- Exit strategies
- Vendor lock-in
- Implementation planning

Visual learner
Has played violin since age 5
Reads above grade level
Wants to learn Mandarin
Hates memorizing dates for history
Hates memorizing dates for history
Loves basketball better than soccer
Complains that her science teacher doesn't really explain things
Struggles with dividing fractions

THIS TIME IT'S PERSONAL

True student-centered learning has a lot of support from education leaders, but it can't really happen without all the right technology infrastructure to drive it. And the technology just may be ready to deliver on its promise. **by Jennifer Demski**

EDUCATORS HAVE KNOWN FOR SOME TIME now that a one-size-fits-all approach to learning does not lead to the level of student engagement and academic success that schools strive to achieve. In their search for a more customized approach to delivering instruction, they've explored project-based learning, addressed different learning styles, and increased collaborative learning among students. Educators have also looked to technology for customizable solutions, implementing 1-to-1 laptop programs, utilizing data-driven decision-making tools, and setting up learning management systems to access digital content.

But, for the most part, schools have incorporated these 21st century instructional techniques and tools as add-ons to the teacher-centric 19th century classroom structure, in which the majority of the curriculum is pulled from a textbook, and, despite the best intentions of all involved, most students learn the same thing in the same way at the same time.

Enter personalized learning, a student-centered teaching and learning model that acknowledges and accommodates the range of abilities, prior experiences, needs, and interests of each student—with the goal of moving every student to a higher standard of achievement. It's not a particularly new theory (versions of it have been around since the 19th century), but it has gained currency among many of today's education thought leaders, particularly because technology seems to be ready to do its part to provide a more personalized learning environment for every student.

By marrying the principles of personalized learning with the tools of technology, some educators believe that they have a chance to create the kind of customized learning environment that can finally break schools out of the industrial-age model of education to bring about true 21st century school reform.

But what exactly is personalized learning? And why is technology so central to its outcomes?

De-Mystification Is in Order

To start with, personalized learning is not individualized learning, in which students share the same learning goals but progress through the curriculum at their own pace. Nor is it differentiated instruction, in which students also share learning goals but receive instruction that is tailored to their learning needs.

In the National Education Technology Plan, the US Department of Education's Office of Educational Technology describes personalized learning as an instructional approach that encompasses both differentiation and individualization, but is also flexible in content or theme to match the specific interests and prior experiences of learners. Karen Cator, director of the OET, explains further: "Personalized learning really takes into consideration that long tail of interest, of prior motivation, of languages. It leverages all the different things that people have in their repertoire to add value to their learning."

The Personalized Learning Foundation says attributes of a personalized learning model include "a strong emphasis on parental involvement, smaller class sizes, more one-on-one teacher and student interaction, attention to differences in learning styles, student-driven participation in developing the learning process, technology access, varied learning environments, teacher and parent development programs, and choices in curriculum programs."

In the PLF model, technology is just one factor, but there are many educators—including Cator and her boss, Secretary of Education Arne Duncan—who advocate a tech-enabled model of personalized learning. According to Cator, access to technology is "the essence and the nature of the opportunity to provide a much more personalized learning environment for students."

In any personalized learning model, the student—not the teacher—is the central figure. In a technophilic view of a personalized learning environment, students have access to traditional learning resources like books and hands-on materials, and time-honored support from people like teachers, parents, mentors, coaches, and schoolmates. But, critically, they have ubiquitous access to technology, which allows them to connect to learning communities, information management and communication tools, personal learning networks, information and data, expertise and authoritative sources, online tutoring and guided sources tailored to their needs, knowledge-building tools, and peers with common interests.

In Cator's words, "The opportunity with technology is this vast array of resources of interest areas that we can bring into the classroom. The classroom is not a closed system anymore."

Leading Through Technology

Thomas Greaves, CEO of The Greaves Group, an educational consulting firm, takes Cator's point one step further and says that it's doubtful personalized learning could happen—or at least, happen well—without all of the right technological tools already in place.

"The student, using technology, is better able to personalize their learning than a teacher is," he says. "Teachers don't have time to sit down and study each student, each day, in each course to figure out what they're going to do differently with them. Teacher-driven personalization ends up being very weak, with very few factors, whereas if the students are leading their personalization via technology, then their instruction can be personalized based on a hundred variables instead of one or two."

Greaves also seems to suggest that tech-driven personalized learning will, by its very nature, enable individualized learning and that holy grail of teaching, differentiated instruction, in which a teacher adapts classroom instruction to the various needs and skill levels of each student. Historically, differentiated instruction, as a practice, has been incredibly difficult, if not impossible, to implement in a teacher-centered learning environment that is driven by a print-based curriculum. Personalized learning may finally allow individualization and differentiation to actually happen in the classroom.

Ideally, tech-driven personalization combines the best of individualized learning—self-paced, diagnostic-driven—with the ability to adapt to a student's specific learning styles, interests, and backgrounds. Personalization could be as simple as students compensating for any gaps in their pre-existing knowledge by allowing them to unobtrusively Google unknown terms during group instruction rather than raising their hands, or as sophisticated as students entering information about them-

Collaboration and Personalized Learning

As Mark Edwards, superintendent of the **Mooresville Graded School District** (NC), explains, "Personalized learning can look different from hour to hour and from class to class, but there are some common threads. There are always high levels of engagement, high levels of differentiation, lots of opportunities for students to expand their personal interests through school projects, and a lot of collaboration."

When Edwards' district implemented its 1-to-1 laptop and personalized learning initiatives for third- through 12th-grade students across the district's eight schools, it completely redesigned its classrooms as well, replacing rows of desks with tables around which students gather for small-group learning. It also moved to a digital curriculum—the district is now 90- to 95-percent textbook-free.

Edwards says that the increase in student engagement and achievement was dramatic from the start. In five years, the graduation rate has risen from 64 percent to 91 percent. Overall composite scores have risen from 63 to 88—third-best in the state, even as the district ranks 99th in the state in regard to funding. Mooresville pioneered the district-level implementation of the tech-powered personalized learning model, and routinely hosts visitors looking to implement such a model in their own districts.

selves into a piece of software that selects digital content based on the their interests and skill levels.

Key Tech Elements

Greaves has surveyed more than 1,000 schools in Project RED (Revolutionizing Education), a national survey that his group is conducting, which analyzes the factors that contribute to student success in technology-transformed schools. In his research, Greaves found that teachers who had access to digital tools spend more time each day on personalized and collaborative small-group instruction than on traditional lectures. Greaves found four specific tech implementations as most effective in supporting personalized learning in these classrooms:

A well-implemented 1-to-1 laptop initiative. "Overall, across 1,000 schools, in every grade, in every subject, 1-to-1 laptop initiatives outperformed all other technology-distribution initiatives," explains Greaves. Yet, he adds a caveat: "How the 1-to-1 initiative is implemented is equally important. A well-planned cart or 3-to-1 initiative will outperform a poorly implemented 1-to-1 program." Greaves found that 1-to-1 districts that provide formal change management leadership training for school principals were more likely to see increased teacher training on effectively integrating the laptops into the curriculum, thus leading to an increased incorporation of tools for personalized learning.

Learning management systems. "The learning management system has a tremendous ability to personalize," explains Greaves, "because they provide the framework that supports several different personalization functions without adding a lot of extra work for the teacher. In fact, it's difficult to have a robust personalization system in place without a well-implemented learning management system."

Access to online remedial coursework. "We found that the No. 1 predictor for success in schools in a number of areas was the availability of fully digital-driven remedial courses that had online curriculum behind them," explains Greaves. In one California high school, Greaves' team found a remedial algebra class in which every student had already failed the course twice. With the same teacher, they now were accessing the coursework on laptops in a more personalized environment, where the teacher moved from student to student to answer questions as needed, while the students proceeded through digital course materials at their own pace. One hundred percent of the students who attended the class achieved a passing grade.

Open access to search tools. "The effect of search tools on student achievement was kind of amazing to me," remarks Greaves. "The more searches a kid did, the better they scored in a number of variables—the better their test scores, the better their attendance, the more likely they were to go to college, the less likely they were to drop out of school." While he can't claim that the relationship is causal, Greaves speculates that "a big part of personalization is to keep the learning switch always on," he says, and tech tools like search offer students a chance to keep learning in motion.

The Netflix Factor

Ed tech experts are also looking to products being developed outside of the education market for ideas on further personalizing core curriculum content to match a student's specific interests and abilities—the so-called "Netflix factor."

"The opportunity for mass customization is already happening in the consumer sector, with targeted ads, for example, or movie recommendations based on what a consumer has previously viewed or rated positively," remarks Cator. "We can learn a lot from these algorithms and from the different methodologies behind using data to provide more directed, personalized, and customized learning experiences for students."

Some companies are already there. Language arts publisher Capstone, for example, modeled its web-based MyON Reader software on the Netflix model.

[keyword: personalize
visit thejournal.com]

Launched in January 2011, the software pulls up personalized reading lists for students from a library of more than 14,000 enhanced digital books, based on their interests, their Lexile level (the software does a Lexile assessment), and their ratings of their previously read books. Embedded assessments track reading comprehension, and the software delivers data to teachers that allows them to track their students' progress.

The **Charleston County School District** (SC) introduced the software to its students, districtwide, just before the summer 2011 vacation. One and a half months later, students logged more than 500 hours of summer reading, according to media services coordinator Constance Dopierala. "I expected to see that in our suburban schools where students have computers and internet access at home, but our inner-city, high-poverty students are also logging hour after hour of reading," she says. "I'm just blown away by that. I can't wait to see what this does for student engagement in all of our schools."

Ed tech experts predict that opportunities for personalized learning will grow as districts are able to set up security infrastructures that allow students to access materials on their personal smartphones, which will make schools more ubiquitous technology environments.

"Students have access to so much information now," says Katie Morrow, media specialist and technology teacher at **O'Neill Public Schools** (NE), which has implemented a large 1-to-1 personalized learning program (see "Always Support the Core," page 36). "And with that access comes the ability to choose what they want to learn, and when and how they want to learn it, and it's all available to them on their smartphones."

Jayne James, formerly the senior director of education leadership at ISTE, also sees the merits of adopting smartphones into the classroom.

"With the right guidance, smartphones are very powerful," she says. "In classrooms where students are allowed to access their own smartphones for learning, they're already accessing resources almost constantly to build out their learning agenda. The trick is allowing them to use this while maintaining the safeguards that schools put in place to make sure students aren't accessing inappropriate materials, to make sure the network is secure, and to make sure that students are continuing to be good digital citizens."

Cultural Change

Greaves has visited more than 1,000 schools as part of his research on technology-transformed schools and he says that he can point to only one district—**Mooresville Graded School District** (NC)—"where you can go into every classroom in every school and see personalized learning in action."

Greaves' experience suggests just how far there is still to go to implement a true personalized learning model on a national level. Clearly it's not just a matter of implementing 1-to-1 programs and accessing some digital curricula. Cultural change has to happen for all stakeholders—including teachers themselves, who, let's face it, are likewise a product of the industrial education model and need support in understanding and embracing this kind of radical change.

Educating parents and community members about personalized learning was a key part of Mooreseville's effort to get buy-in from stakeholders. When the district team began planning the implementation of its 1-to-1 personalized learning initiative, it started off by building community awareness—both within the district's internal community of teachers, principals, and staff, and in the external community beyond the district's walls—of what they wanted the school experience to be.

Then, in addition to instituting ongoing differentiated teacher training, strengthening the leadership skills of grade-level and department chairs, and increasing their data-driven decision-making capabilities, they extended their training efforts to parents and guardians who, in the personalized learning model, are an important resource in a students' learning network. "We have opportunities throughout the year for parents to come in and learn more about what their children are learning and how they are learning it," says Mooresville Superintendent Mark Edwards.

O'Neill Public Schools worked equally hard to help teachers make the cultural shift. In addition to coaching, modeling, and weekly tech meetings, the district has encouraged teachers to use Facebook, Twitter, and other social networking tools to expand their professional learning. "When they're living and breathing these tools," explains Morrow, "they can see the value that social media can bring into their class."

At the start of its 1-to-1 initiative, the district also made the bold decision to issue laptops to students and teachers simultaneously. "We've never forced or mandated a certain number of technology-based lessons, we just let the teachers know that they have to allow the students the opportunity to use the computer if they need to," Morrow says. "Tech-based personalized learning in our school has grown so quickly and so rapidly, though, and we really believe it's being driven by the students suggesting and demonstrating ways to use the laptops within the curriculum." Although the positive response from teachers was not unanimous when they began the 1-to-1 program in 2007, when they had to decide in 2011 whether to renew the program for four more years, 100 percent of teachers were in favor of continuing.

Mooreseville's Edwards believes that schools have no choice but to embrace a tech-enabled personalized learning model for education.

"It's a moral imperative," he says. "If we want our students to be able to find meaningful work and be contributing members of a global society, then we need to prepare them for their future, not our past." the

Jennifer Demski is a freelance writer based in Brooklyn, NY.

Always Support the Core

While skeptics or critics may view a multi-dimensional student-centered model as some loosey-goosey abandonment of high standards, proponents of personalized learning believe this model actually promotes core learning better than the 19th century industrial learning model currently in place, in which all students learn the same thing in the same way at the same time. As the National Education Technology Plan states, "A core set of standards-based concepts and competencies form the basis of what all students should learn but, beyond that, students and educators have options for engaging in learning: large groups, small groups, and activities tailored to individual goals, needs, and interests."

Jayne James, former senior director of education leadership at ISTE, refers to personalized learning as "the marriage of the supply-side and demand-side approaches to education. If you look at how students learn outside of the school day, it's very demand-driven," she says. "'What piques my curiosity? What am I interested in?'" A personalized learning model, she says, "allows students to take their interests and connect them to what their teachers supply—the curriculum and the competencies that we want them to learn."

While personalized learning supports the core curriculum, advocates say it also provides a more holistic approach to learning and skill development beyond the core subjects. "We understand that students need to take math, English, and history," explains Katie Morrow, media specialist and technology teacher at **O'Neill Public Schools** (NE), "but true learning that molds kids into lifelong learners has to be connected to something they care about.

"If I teach myself something that I care about, like playing a specific instrument, the process that I go through in connecting with experts, collaborating with other people who play that instrument, practicing, performing, and recording—everything that's associated with my learning path will carry over into English class when I need to write a research paper. I'm going to know how to use my social networks and connect to experts. I'm going to understand deadlines and work ethic. I'm going to know how I learn best."

CALLING ALL TECH-SAVVY DISTRICTS!

Nominations are now open for the 2012 Sylvia Charp Award for District Innovation in Technology.

T.H.E. Journal and ISTE are seeking nominations from school districts that have implemented effective and innovative district-wide technology programs. The top program could be honored as the **2012 Sylvia Charp Award for District Innovation in Technology**. The winning district will:

- Be honored at ISTE 2012, June 24-27, 2012, in San Diego, CA
- Receive $2,000 for travel and registration expenses to attend ISTE 2012
- Be recognized in *T.H.E. Journal* and *Learning and Leading with Technology*

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SPECIAL SECTION

What's Ahead at FETC 2012

The 2012 Florida Educational Technology Conference (FETC) brings education leaders and technology experts together to exchange techniques and strategies for teaching and learning success. This year's event, held in Orlando Jan. 23-26, will feature more than 150 sessions, 100-plus workshops, keynotes, special events, and an exhibit hall showcasing the latest from hundreds of education technology vendors. In the following pages, *T.H.E. Journal* connected with a number of speakers and presenters in advance of the show to spotlight some of FETC's most significant issues and events. For more information about the conference, go to **fetc.com**.

KEYNOTE SPEAKER

It's a 'Pull, Pull' World

Michael Wesch, a cultural anthropologist and researcher in the modern discipline of digital ethnography, will talk about the new media landscape during his keynote presentation at FETC 2012.

BY JOHN K. WATERS

EDUCATORS PLAY a critical role in the development of the essential skills students need to navigate successfully the blizzard of unfiltered information available to them via the web. Michael Wesch, associate professor of cultural anthropology at Kansas State University, believes they should also be fostering something more basic: curiosity and imagination.

"The new media landscape is a 'pull' environment," Wesch says. "Nothing is pushed to you from the web, which makes it essential that we inspire students to seek out the knowledge that's out there. The content isn't fundamentally different, but the environment just demands more curiosity and imagination."

Wesch, a cultural anthropologist and researcher in the modern discipline of digital ethnography, will expand on this idea during his Wednesday keynote presentation at FETC 2012, the annual education technology conference.

Wesch is a well-known thought leader who burst into the public consciousness in 2007 when a video he created to launch Kansas State's Digital Ethnography Working Group became a YouTube sensation. "The Machine Is Us/ing Us" was released to the video publishing site on Jan. 31 of that year. Within a month, the little video created in Wesch's basement in St. George, KS, had been seen by more than 1.7 million people, translated into five languages, and shown to large audiences at major conferences on six continents. To date, the video has been viewed nearly 12 million times and translated into more than 10 languages.

Wesch is best known as a researcher, but he's also an active developer of innovative teaching techniques, including the World Simulation project, which is the centerpiece of Kansas State's Introduction to Cultural Anthropology course. Wesch describes the project on his Mediated Cultures website as "a radical experiment in learning, created in a fit of frustration with the large lecture hall format which seems inevitable in a classroom of 200 to 400 students."

Before turning his attention to the effects of social media and digital technology on global society, Wesch spent two years studying the implications of writing on a remote indigenous culture in the rain forest of Papua New Guinea. Wesch found himself for the first time in a society that was not mediated. He has described how "new media" in the form of printed census books changed the village dramatically.

"We have to recognize in our society that the new media we see in our environment are not just new means of communication, not just tools," he told attendees at the Campus Technology 2011 conference in July. "Media change what can be said, how it can be said, who can say it, who can hear it, and what messages will count as information and knowledge."

Wesch compares the need to "reinspire curiosity and imagination" in students with bridging the digital divide. "We've talked for years about the digital divide and how, if you're on the wrong side of that technology access gap, you get left behind," he says. "I think there's the potential now for a kind of curiosity gap. Consider how much further ahead a curious student will be, compared with a student who lacks curiosity, in an environment in which he or she can reach out and grab new knowledge anytime, anywhere on all kinds of devices. If you're a curious person, you'll learn and grow; if you're not, you could just drift along while others race ahead."

Wesch is also likely to talk with FETC attendees about teaching students to become "knowledge-able," his term for the ability to find, sort, analyze, criticize, and ultimately create new information and knowledge.

"It's just not enough anymore to know a bunch of stuff," he says. Being knowledge-able, he adds, is also about recognizing that, while we're using these tools, the tools might be changing us. the

What is the best technology available for personalized learning?

BRENT WILLIAMS: Easy answer: the iPad.

ELLIOTT SOLOWAY: Ahh, let me think…hmmm hmmm….I think…hmmm…personal, 24/7, networked, embedded in your palm: Mobile technologies!

KATHY SCHROCK: Since we all learn differently, I think the best way for personalized learning to occur is to offer the student the option of using the thing that helps them learn best. Personalized means just that—figuring out how you best learn and using the technology hardware, software, and tools to get access to the information you need to succeed.

ADAM BELLOW: I think of my iPhone and Twitter as the best personalized learning tools.

Q&A

The Speakers Speak Up

In preparation for this year's FETC conference, *T.H.E. Journal* editors asked a number of speakers and presenters about their opinions on issues facing K-12 education today. On this page and sprinkled throughout this special section devoted to FETC are their responses.

Adam Bellow
Founder, eduTecher
Featured speaker

Steve Dembo
Online community manager, Discovery Education
Featured speaker

Howie DiBlasi
CEO, Digital Journey
Featured speaker

Julie Evans
CEO, Project Tomorrow
Featured speaker

Rushton Hurley
Executive director, NextVista.org
Featured speaker

Meg Ormiston
Professional development specialist, Tech Teachers
Featured speaker

Kathy Schrock
Director of technology (ret.), Nauset Public Schools (Orleans, MA)
Featured speaker

Elliott Soloway
Professor, University of Michigan
Featured speaker

Stephen Veliz
Teacher, Swift Creek Middle School (Tallahassee, FL)
Session presenter

Michael Wesch
Associate professor of cultural anthropology, Kansas State University
Keynote speaker

Brent Williams
Director, Kennesaw State University (GA)
Featured speaker

What are two elements every 21st century classroom should have?

A sense of community. A sense of purpose. **—MICHAEL WESCH**

Wireless mobile technology for each child and an enthusiastic, well-trained teacher. **—BRENT WILLIAMS**

Inquiry learning activities and networked mobile devices. **—ELLIOTT SOLOWAY**

Tungsten: For those light bulb moments that should be occurring daily. Oxygen: It should be like technology—ubiquitous, necessary, and invisible. **—STEVE DEMBO**

What's the best way to move away from the conventional classroom with 30 chairs facing forward?

Find projects and problems that are real and relevant to the students, and then help them unleash their creativity and harness their skills to solve and create. **—MICHAEL WESCH**

Put wireless, mobile technology (i.e., iPad) in the hands of every child. **—BRENT WILLIAMS**

I look at the Apple stores as a great way to set up a classroom. There can be a section for sitting and watching a demonstration or lesson—but it is a small station. The main area is desks for groups that should be on wheels and movable to allow group work and class discussions. **—ADAM BELLOW**

The principal says, "Folks, this is the way we are going; folks, this isn't optional." **—ELLIOTT SOLOWAY**

Are young teachers really more tech-savvy than older teachers?

Most technologies today are so simple to use that they do not require one to be tech-savvy. What makes somebody more tech-savvy is knowing which technologies to use. **—MICHAEL WESCH**

Just because you have a smartphone and a Facebook account, it doesn't make you tech-savvy—at least not in a way that matters in the classroom. I often feel that open-minded teachers that are seasoned in their craft are often the best users of technology in the classroom. **—ADAM BELLOW**

What is the No. 1 complaint students have about technology in schools?

Students want to know why they cannot use their own laptops or tablets on the school's WiFi. **—KATHY SCHROCK**

Students are frustrated because the equipment in most schools is old and the technology is not personal to them. **—MEG ORMISTON**

KEYNOTE SPEAKER

The Three Key Literacies

Curriculum expert Heidi Hayes Jacobs offers a clear and practical approach to upgrading standards-based curriculum for the 21st century.

BY JENNIFER DEMSKI

HEIDI HAYES JACOBS, the founder and president of Curriculum Designers, executive director of the National Curriculum Mapping Institute and Academy, and author of the groundbreaking "Curriculum 21: Essential Education for a Changing World," will be a featured keynote speaker at FETC 2012. *T.H.E. Journal* recently sat down with Hayes Jacobs to discuss why educators must embrace curriculum reform, the impact of the Common Core State Standards, and her goal for the future of K-12 education.

***T.H.E. Journal*: What inspired you to develop the curriculum plan you set forth in "Curriculum 21?"**

Heidi Hayes Jacobs: In teaching and curriculum design, my focus has always been on choices. It's always been that we, as educators, should be making astute and responsive choices that prepare our students for the future. Unfortunately, it's become clear that the future that many schools are preparing their students for is 1980. Ten percent of the 21st century is over; the question now isn't "whether to," it's "how to." The plan I developed gives teachers and educators a handle on how to reinvent, reboot, and replace aspects of what they teach, and how to modernize and upgrade their curriculum.

***T.H.E.*: How did you identify and develop your three key literacies for 21st century learning?**

Hayes Jacobs: While researching and writing "Curriculum 21," I worked with teachers to explore and identify key areas of instruction that educators should focus on once they've made the choice to upgrade their curriculum. It was immediately clear that new points of articulation and meaning-making had emerged that required students to have the ability to take some of the great classical traditions of print literacy and apply them to new forms of accessing information and articulating response.

There seemed to be three related but distinctive toolsets—digital literacy, media literacy, and global literacy—that had become key in helping students navigate through the curriculum that they need to master and the investigations that they need to make in order to prepare themselves for right now, let alone for what they'll face 15 years from now when they're going to be in the workplace.

***T.H.E.*: You are noted for your work in curriculum mapping and standards alignment. How do the three literacies you mention relate to the increasing adoption of Common Core State Standards?**

Hayes Jacobs: I think they go hand in glove. The Common Core strikes me as a great opportunity for schools to upgrade their practice. There is an absolutely clear emphasis on media and digital tools in the Common Core, and the cross-disciplinary English language arts standards mean that students will be developing critical thinking skills and using new media in all disciplines. I am most definitely going to be discussing the relationship between "Curriculum 21" and the Common Core in my keynote presentation because I think this is great news.

In fact, I just finished work on a LiveBook for PD360 titled "Mapping to the Core: Integrating the Common Core Standards Into Your Local School Curriculum."

***T.H.E.*: What's next for you?**

Hayes Jacobs: New school versions are my biggest goal. That's where my heart is right now. For example, what should school look like? Do students even need to come to school every day, given the technology that's now available? How should schedules be formatted, and how should we be organizing ourselves? What kind of buildings should we have? There are a lot of exciting things going on in our schools and, because of the work I do and where I'm able to go, I'm fortunate to be able to learn about different models and approaches.

How many years will it be before assessment is 100-percent online?

STEVE DEMBO: Conservatively? A decade. Change within the education system occurs slowly in the absence of a "Sputnik" moment. Barring that, the shift will begin with forward-thinking schools and end when traditionalist environments are mandated to change.

RUSHTON HURLEY: The better question for me is how long it will take for assessment to become 100-percent individualized. I fear that the move to online testing will simply allow those who prefer simplistic bubble testing an easier path to pushing their systems on schools.

BRENT WILLIAMS: As soon as schools abandon reliance on expensive, hard-to-maintain PCs.

WORKSHOP

Administrators, Where Are Your iPads?

Author, consultant, and former teacher and administrator Susan Brooks-Young will lead a hands-on workshop on the role school and district administrators have in the implementation of an iPad program in their classrooms during FETC 2012.

BY DIAN SCHAFFHAUSER

ALL YOU HAVE TO DO is practically turn around and you'll run into a professional development offering that claims to help you integrate the Apple iPad into classroom instruction. But that can only go so far, says Susan Brooks-Young, who works with educators on the effective use of technology for both adults and kids. What's often missing, she says, is the role that the school or district administrator plays in iPad deployment.

Teachers may be in charge of their classroom domains, she notes, but they don't always have a lot of impact on what happens in the classroom next door, let alone schoolwide. "It's really the [school] administrator's job to be aware of the effective use of various technologies or other instructional strategies," Brooks-Young says, "and then to ensure those kinds of uses are present on their campuses."

Brooks-Young—an author and consultant with more than 23 years experience as a teacher and administrator—will cover this issue in a workshop entitled, "I Have an iPad—Now What? Tips and Apps for School Administrators," one of four sessions she will lead at FETC. Brooks-Young sees a lot of iPad implementations taking place in districts and schools before administrators "are really on board" or before they recognize the leadership roles they need to take in regard to how the devices are used.

In her view, that lack of broad oversight creates a couple of problems. First, the iPad initiative can end up being hijacked by overly ambitious iPad proponents. "There are some people who argue very passionately, if it's not 1-to-1, don't bother," says Brooks-Young. "I don't agree with that. I see iPads or other touch devices being one of many tools that need to be made available to kids."

The second problem is that teachers equipped with devices but no guidance from the front office may be left rudderless and forced to sort out appropriate usage on their own. When that happens, Brooks-Young says, "First use tends to become entrenched use. An iPad may simply become a way for kids to get to the internet to do research faster or to do drill and practice. You can do that with other devices that are less expensive."

What's unique about the iPad, explains Brooks-Young, is its touch technology ("intriguing to kids"), its built-in camera and microphone ("allowing them to create materials"), and its use of apps.

"I can do a bajillion things on my iPad without ever actually opening the browser," she says. "I can be online and offline using various apps." Why is that important in the classroom? "With thoughtful selection of apps and with thoughtful activities surrounding what the kids do with the apps once they're there, that can make a huge difference in whether or not something is being used effectively." the

What is your favorite green technology in schools?

RUSHTON HURLEY: Online, collaborative tools such as Google Docs that get us away from using several rain forests' worth of paper each day.

STEVE DEMBO: E-mail. We send so many things home via paper without a thought about the overall environmental impact. Shifting school-home communication to e-mail would make an enormous difference over the course of a year.

MICHAEL WESCH: Bike racks.

BRENT WILLIAMS: A fully charged iPad.

FETC 2012

FEATURED SPEAKER

Building the OMG Classroom

Anthony A. Luscre, director of technology for Mogadore Local Schools (OH) and owner of SearchFindKnow.com, will present a session entitled "OMG, I CNT BLIEV WE R REALLY GTTNG 2 DO THS IN SKUL."

BY ANTHONY A. LUSCRE

ANTHONY A. LUSCRE, director of technology for **Mogadore Local Schools** (OH) and owner of SearchFindKnow.com, can trace his passion for discovering new information back to before the advent of the web with his first-grade Christmas wish list that included a set of encyclopedias. He speaks frequently on educational techwinology and will present a session during FETC entitled "OMG, I CNT BLIEV WE R REALLY GTTNG 2 DO THS IN SKUL."

The editors of *T.H.E. Journal* asked Luscre to write a bit about what it takes to create what students will describe as the "OMG Classroom." Here's what he had to say:

STUDENTS SPEND A lot of time outside of school using high-tech forms of communication, so why not capture these skills to improve student learning? Data from a recent Pew Research Center survey shows more than 75 percent of teens own cell phones, 73 percent use online social networking sites, and 38 percent share artwork, photos, stories, or videos online. Despite these statistics, schools and teachers have done little to capture this usage to benefit instruction and student learning, and to take advantage of the situation.

THE CHALLENGE

My challenge to teachers is to create assignments, projects, and techniques to capture your students' attention. Projects should be technology-rich, highly engaging, and fun learning experiences that reflect real-world skills. One indicator of success will be when parents ask their children, "What did you do in school today?" and the students forgo the usual "Nothing" and answer with, "OMG, I can't believe what we got to do today!"

THE DEATH OF…

I know many teachers are leery of embracing students' outside-of-school technology use. They reply with statements such as, "Texting will be the death of proper spelling, grammar, and syntax," and, "Having always-available web access will be the death of learning facts." That's why the first portion of my presentation focuses on what I call the "litany of this new technology will be the death of…"

For example, according to Socrates (469-399 B.C.), writing was going to be the death of thinking and debate. Fifteenth-century educators believed that the printing press and wide availability of books would be the death of scholarly writing.

Next I like to demonstrate that what we think of as the way things have always been and should continue to be are actually constantly changing and adapting to popular use. For example, our alphabet has added additional letters and even the lower case since its first use by Romans.

THE DILEMMA

The next inevitable response from teachers is, "My school's AUP (acceptable use policy) and/or internet filter does not allow the use of Twitter, Facebook, WikyBlog, etc." I then explain that there are two approaches that classroom teachers can use if this is the situation: Create a dialogue with administrators to change AUPs and filtering to allow use of some of these tools or otherwise use "AUP-safe alternatives."

Many of these AUP-safe alternatives involve low-tech or alternative technologies or websites. Two great examples are "low-tech tweeting" and "physical Facebook walls." Low-tech tweeting utilizes paper with 140 squares to allow students to compose their pseudo-tweets. Physical pseudo-Facebook walls can utilize large sheets of paper, bulletin boards, or dry erase boards posted on the walls of the classroom. Students can then add information, status, comments, photos, likes, etc., to their individual physical walls.

There also are a large number of alternative web sites such as Edmodo and Schoology that are education-oriented, social networking sites that can provide safe and private groups for students interested in social media. the

What's the one technology in your home or car you wish was in schools?

BRENT WILLIAMS: If I were king for a day, I would bestow an iPad on every school-age child.

STEVE DEMBO: TiVo. I'd love to see every teacher make it a habit of recording lectures, conversations, and demonstrations so that students could access them on demand.

HOWIE DIBLASI: Interactive video conferencing.

JULIE EVANS: Ubiquitous wireless access to the internet.

WORKSHOP

Three Shots to Caffeinate Your Presentations

Author and presentation expert Lynell Burmark offers three concrete tips for teachers to improve their PowerPoint presentations and better engage students.

BY LYNELL BURMARK

ENOUGH SNOOZE-INDUCING PowerPoints already! Time to caffeinate your slides and your delivery and raise retention 40 to 50 percent in the process.

Let's look at some tips and examples to help us get started.

1. Tweak the text. I'd like to say, "*Lose* the text," as in "no text on your slides—zero, zip, nada," but I know that's like tearing the net out from under an already scary trapeze act. So, until you're comfortable, I recommend using less text and taking care to format and lay it out well.

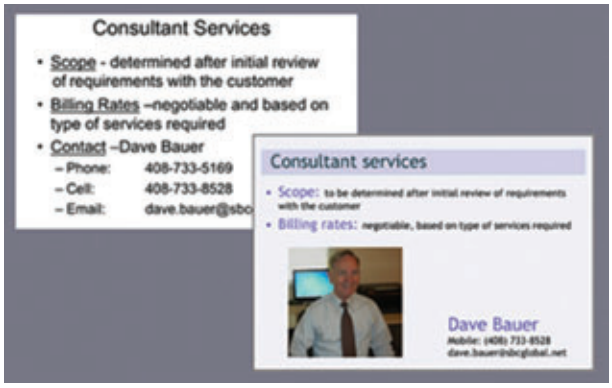
Comparing the before-and-after slides of "Dave's résumé" at the right, we can see that lowercase is faster to read than uppercase, varied leading (space between the lines) organizes information better than uniform line spacing (auto returns), the eye goes to color before black and white, images draw attention before text, and so on.

2. Start with the concrete. There is a continuum between the abstract and the concrete. Take the rose, for example. If you were presenting the concept to an audience that had never seen (smelled or touched) a rose before, consider the following five approaches (from the most abstract to the most concrete) of introducing the flower in your slideshow:

- Project the word "*rose*";
- Display a clip-art rose;
- Fill the screen with a full-color photographic image of a rose;
- Show the video of a rose, maybe with "Lo, How a Rose E'er Blooming" playing in the background; or
- Hand everyone a real rose!

With time and budget constraints, we may not have the perfect video or the actual live object(s) for every concept in every presentation, but at least we can start using more full-screen photographic images!

First the (concrete) image, then the (abstract) words. Remember show-and-tell? There's a reason it's not called tell-and-show.



3. Change it up. Just two words to remember here: *ten* and *two*.

After *ten* minutes of sit and get, audiences need a change of pace for at least *two* minutes.

The two minutes is not an unrelated time-out, but rather a different way of recapping what was just shared or previewing the coming attraction. It's the perfect time for audience engagement, peer-to-peer sharing, a humorous (and relevant!) video clip, connecting with prior knowledge, and using different modalities to match the learning styles of diverse learners. It's another opportunity to communicate ideas that go beyond what has become the traditional way of doing so. the

What are two elements every 21st century classroom should have?

STEPHEN VELIZ: Dependable wireless connectivity and, more importantly, teachers willing to employ 21st century strategies in using them.

KATHY SCHROCK: The ability to project and the ability to create.

RUSHTON HURLEY: Strong WiFi with minimal filtering, and teachers prepared to help students understand how to hold themselves to higher standards when encountering problematic material.

HOWIE DIBLASI: Creativity and critical thinking.

FETC 2012

FEATURED SPEAKER

Mobile Technology Changes the Game

As schools start to place mobile technologies in the hands of every student, the traditional use of the classroom PC is waning. Education technology consultant Brent Williams talks about the challenges ahead and why this is in everyone's best interest.

BY STEPHEN NOONOO

LIKE THE CARTRIDGE pen and the ditto machine before it, the traditional PC's best days in the classroom may be over.

"I think we've finally established that we're not going to get any gains in SAT scores, or whichever kind of test scores you want to look at, by putting two or three PCs in the classroom," says Brent Williams, the director of the iTeach Center at Kennesaw State University near Atlanta. "It hasn't worked."

Williams, who also serves as an education consultant specializing in emerging technologies, is a firm believer that the new standards in personal computing—namely smartphones and tablets—are leading education in a bold and irreversible new direction.

"What we do know is that when we put technology in the hands of every kid, kids use it, they get excited about it, and I think there's great hope that we will actually see some improvement in teaching and learning as we make this shift away from the sort of boat anchor PC," he says.

Williams will expand upon his visions for technology in the classroom during his upcoming presentation, "A Real Paradigm Shift," on Jan. 25.

Before real change can occur, however, schools will need to find a way to get teachers as excited over mobile technologies as their students, which will undoubtedly require laying some groundwork. "The main thing is teacher training," Williams says. "That is the one thing that has got to occur…. Don't just tell them how to do it, show them."

Right now there are a few different ways that could play out: Schools can plan group training sessions during vacations or summer breaks, or they can invite trainers to observe classrooms individually and provide feedback.

Students—likely to be already ahead of the curve when it comes to using this technology—can also take the lead, allowing teachers to focus on learning, not tech support. "Kids can be a great help to each other," Williams says, "and, as we know, they typically are."

Eventually, Williams sees the entire learning dynamic shifting to accommodate mobile learning, even if that challenges the convention of the standard classroom. "Why does it have to be in a 'room' at all moving forward?" he muses. "You can go from kindergarten to Ph.D. right now entirely on an iPad. The whole game is changing." the

What will be the most significant change in K-12 IT over the next three years?

KATHY SCHROCK: Each student will have access to a device, 24/7, with internet access. I mean every student.

MEG ORMISTON: We will see more districts allow outside devices into schools. Due to shrinking budgets, we will have to welcome these devices and figure out a way to have enough bandwidth to serve everyone.

MICHAEL WESCH: Cheap tablets, e-readers, and digital "textbooks" (that will look less and less like "books").

STEVE DEMBO: IT departments relinquishing control. Teachers are shifting the programs they use from local computers to online alternatives. BYOD programs will become more prevalent. While it may seem more chaotic to many, on an individual level it will be empowering.

BRENT WILLIAMS: IT professionals are going to need to retool to manage and support a variety of devices in the hands of teachers and students. They will need to accept a reduced role for the traditional PC or laptop.

RUSHTON HURLEY: Momentum has built significantly against the simplistic accountability system our state and federal governments now inflict on schools. The change will either be rolling back the worst parts of it or, if we are brave enough, our taking control over what it means to hold ourselves accountable.

JULIE EVANS: I would identify three key changes: cloud computing, integration of student-owned devices within school networks, and the development of digitally based curriculum and textbooks by districts.

FETC 2012

FEATURED SPEAKER

The Best Free Web 2.0 Tools

Steve Dembo, who directs social media strategy and online community for Discovery Education, will share his favorite digital tools for teaching and learning.

BY DIAN SCHAFFHAUSER

THE TERM WEB 2.0 has been around a while. Some may even consider it passé. Nevertheless, Steve Dembo believes there's still something to say about the topic. "It's an area in constant flux," he says. "That's part of the challenge, and that's why it's still relevant. We're constantly bombarded with new things all the time. So then it becomes a question of how to make sense of it and become aware of the really good things."

A former kindergarten teacher and technology coordinator, Dembo now directs social media strategy and online community for Discovery Education. In that role, he spends the bulk of his time helping teachers find those "really good things" by connecting them to each other through the Discovery Educator Network and helping them share what they're trying out and getting value from in the classroom.

"We really do believe that everybody has a very unique viewpoint," he says. "Even if I [as Steve Dembo] have explained why Wordle is significant 30 times, it's not going to be as meaningful as when it's done by somebody else who has a relatively similar viewpoint. It's going to look very different through the eyes of an elementary school science teacher or through the eyes of a secondary school PE teacher."

Dembo will have more to say on that during his session, "The 10 Best Free Web 2.0 Tools for Teachers," during FETC 2012. One tool he plans to talk about—and, he says, his current Web 2.0 favorite—is Scoop.It, an online resource aggregator.

"It's a great site for managing information overload and for sharing the things you discover," he says. "People love sites like Diigo and Delicious, because they're great to organize your bookmarks, but they're not so great for sharing what you find, especially with someone who they know is not already 'drinking the Kool-Aid.'"

Scoop.It allows the user to create lists by topic, he explains, and then add to them. "The lists themselves and the way you navigate through them are simple and attractive. When you're trying to bring new people on board, that counts. It doesn't look overly geeky."

Although Dembo enjoys singing the praises of free sites—"they're always going to be the most popular"—he encourages people to make flat-out donations or to subscribe to the ones they find value in. "These things aren't free," he points out. "They cost money to develop, to host. The bandwidth costs money, the servers cost money. If I see a site with no obvious revenue stream, whether it be ads or premium features or subscriptions, I get a little concerned because there's a decent chance that that site will not survive."

A couple of websites that have convinced him to open his wallet are Poll Everywhere, which handles audience polling through mobile devices, and TripIt, for making travel plans and organizing them into itineraries. the

What will the confluence of instructional and information technology look like a year from now?

KATHY SCHROCK: As a former technology director—for 13-plus years—I never saw them as separate. Every decision was made based on its positive impact on teaching and learning. So, I hope, a year from now, that is the norm!

ELLIOTT SOLOWAY: It's ALLLLLLLL soooooftware.

RUSHTON HURLEY: I see this from the perspective of leadership. Many schools and districts have for a long time pretended that one person can handle both instructional technology and technological infrastructure, but that leads to failure in one of the two spheres. If the economy improves rapidly, perhaps we'll see more schools and districts work to get two people on their teams instead of one.

STEVE DEMBO: The shift from textbooks to techbooks is going to be at the forefront of this shift. Digital textbooks will drive infrastructure, requiring devices that are less powerful, but more accessible and omnipresent.

BRENT WILLIAMS: We are lucky to finally see technology advance to the point that it now really can be a tool for learning in the hands of teachers and students. The focus will no longer be on the "technology"—but rather on the learning that can take place via the technology.

FETC Exhibitors

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2 Know! Classroom Response System	323
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Academic Superstore	220
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Founder/President, eduTeacher

Mobile Technologies Enable Student-Centric Learning
Elliot Soloway
Arthur F. Thurnau Professor, University of Michigan

iPads, Android Tablets, Chrome Notebooks, and What's to Come
Rushton Hurley
Executive Director, Next Vista For Learning

Literacy in the Digital Age
Kathy Schrock
Educational Technologist

Enabled, Engaged, Empowered: The Student Vision for Digital Learning
Julie Evans
Chief Executive Officer, Project Tomorrow

Building the "Digital Classroom": Cloud Computing and K-12 Education
Howie DiBlasi
Chief Executive Officer, Digital Journey

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Conference Highlights

Pre-Keynote Session: A Technology Shoot-Out
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New This Year: Closing Session App Shootout!
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Monday, January 23, 2012

Registration	7:00 am	•	5:00 pm
Workshops*: (full day)	8:00 am	•	3:00 pm
(morning)	8:00 am	•	11:00 am
(afternoon)	12:00 pm	•	3:00 pm
(evening)	4:00 pm	•	7:00 pm

Tuesday, January 24, 2012

Registration	7:00 am	•	7:00 pm
Workshops*: (full day)	8:00 am	•	3:00 pm
(morning)	8:00 am	•	11:00 am
(afternoon)	12:00 pm	•	3:00 pm
Pre.Keynote Session: Technology Shootout	11:00 am	•	12:45 pm
Technology Solution Seminars	1:00 pm	•	3:00 pm
First Timers Session	2:00 pm	•	3:00 pm
Opening Keynote Session	3:30 pm	•	5:00 pm
Exhibit Hall Grand Opening	5:00 pm	•	7:00 pm
#FETC Tweet Up!	5:30 pm	•	7:00 pm
Conference Shuttle Service	7:00 am	•	8:00 pm

Wednesday, January 25, 2012

Registration	7:00 am	•	5:30 pm
Google Keynote	6:45 am	•	8:15 am
Workshops*: (workshop 1)	8:00 am	•	10:00 am
(workshop 2)	10:30 am	•	12:30 pm
(workshop 3)	1:00 pm	•	3:00 pm
(workshop 4)	3:30 pm	•	5:30 pm
General Session Keynote	8:45 am	•	9:45 am
Coffee Break – Main Concourse Level	9:30 am	•	10:00 am
Exhibit Hall Hours	9:30 am	•	5:30 pm
Concurrent Session 1	10:00 am	•	11:00 am
Dedicated Exhibit Hall Time	11:00 am	•	12:00 pm
Concurrent Session 2	12:00 pm	•	1:00 pm
Concurrent Session 3	1:30 pm	•	2:30 pm
Beverage Break & Dedicated Exhibit Hall	2:30 pm	•	3:00 pm
Concurrent Session 4	3:00 pm	•	4:00 pm
Concurrent Session 5	4:30 pm	•	5:30 pm
FETC Night Out @ Epcot*	5:45 pm	•	9:45 pm
Conference Shuttle Service	6:30 am	•	7:00 pm

Thursday, January 26, 2012

Registration	7:00 am	•	2:30 pm
Workshops*: (workshop 1)	8:00 am	•	10:00 am
(workshop 2)	10:30 am	•	12:30 pm
General Session Keynote	8:45 am	•	9:45 am
Coffee Break – Main Concourse Level	9:30 am	•	10:00 am
Exhibit Hall Hours	9:30 am	•	3:00 pm
Concurrent Session 6	10:00 am	•	11:00 am
Dedicated Exhibit Hall Time	11:00 am	•	12:00 pm
Concurrent Session 7	12:00 pm	•	1:00 pm
Concurrent Session	1:30 pm	•	2:30 pm
Beverage Break & Dedicated Exhibit Hall	2:30 pm	•	3:00 pm
Concurrent Session 9	3:00 pm	•	4:00 pm
Closing Session: App Shootout	4:15 pm	•	5:00 pm
Conference Shuttle Service	6:30 am	•	6:00 pm

**Requires additional fee.*

ProductFocus

By Michelle Fredette

A Time for Tablets

While the tablet market is still in flux, pilot programs in K-12 education are revealing a variety of interesting benefits for early adopters.

TODAY'S NEXT-GENERATION tablets are small and light, they're relatively inexpensive, they have a long battery life, and, with exponential growth in applications, they can do just about anything. Schools may want to get ready now, because if the technology is, as the experts predict, in its infancy, there's a tablet explosion on the horizon.

Michael Gartenberg, a technology adviser for Gartner, points out that tablet technology has been in the works for years, but it was really Apple that created the mass market for them. "The iPad has sort of set the standard for other devices," he says. Many other manufacturers—Samsung, Motorola, Toshiba, Lenovo, and Acer, to name a few—have joined the tablet fray, most based on the Android platform.

Apple and All the Rest

The availability of applications is the main distinguishing factor in the burgeoning market, says Gartenberg: "Most tablets have a pretty good form factor, a pretty good battery life, so it really comes down to, are the applications there? Is the ecosystem there with support for things like accessories and content?" Apple has led the field in terms of app development, now boasting 140,000 apps for the iPad. It's essentially Apple and all the rest, Gartenberg says, and "the rest"—other tablet manufacturers—have invested heavily in Android app development.

Xoom tablet manufacturer Motorola has focused on making sure it "has the right partner ecosystem to attack the market," notes Sheldon Hebert, the company's senior director of enterprise business. "We're working with the textbook companies so that you can leverage textbooks online instead of having to buy a book with your tablet as well. And we're making sure we're leading the foray when it comes to cloud-based applications," Hebert says, adding that this includes enabling students to work with Google Docs to publish a document and share it with their peers for editing.

For its part, Samsung sponsors awards and contests to encourage Android app development and has partners that focus specifically on educational apps, says David Lowe, vice president of enterprise sales at Samsung. "In the K-12 market, it's more about the interesting and innovative learning applications. It's about finding ways to connect with the kids and deliver information that's going to be engaging."

Lowe points out that one area where tablets can be effective is in working with disabled kids. "The tablet offers capabilities that never existed before, such as speech pathology for autistic children, or physically disabled children. The tablet offers opportunities that are nonthreatening and interactive and that manage to get autistic students to interact where they wouldn't have before."

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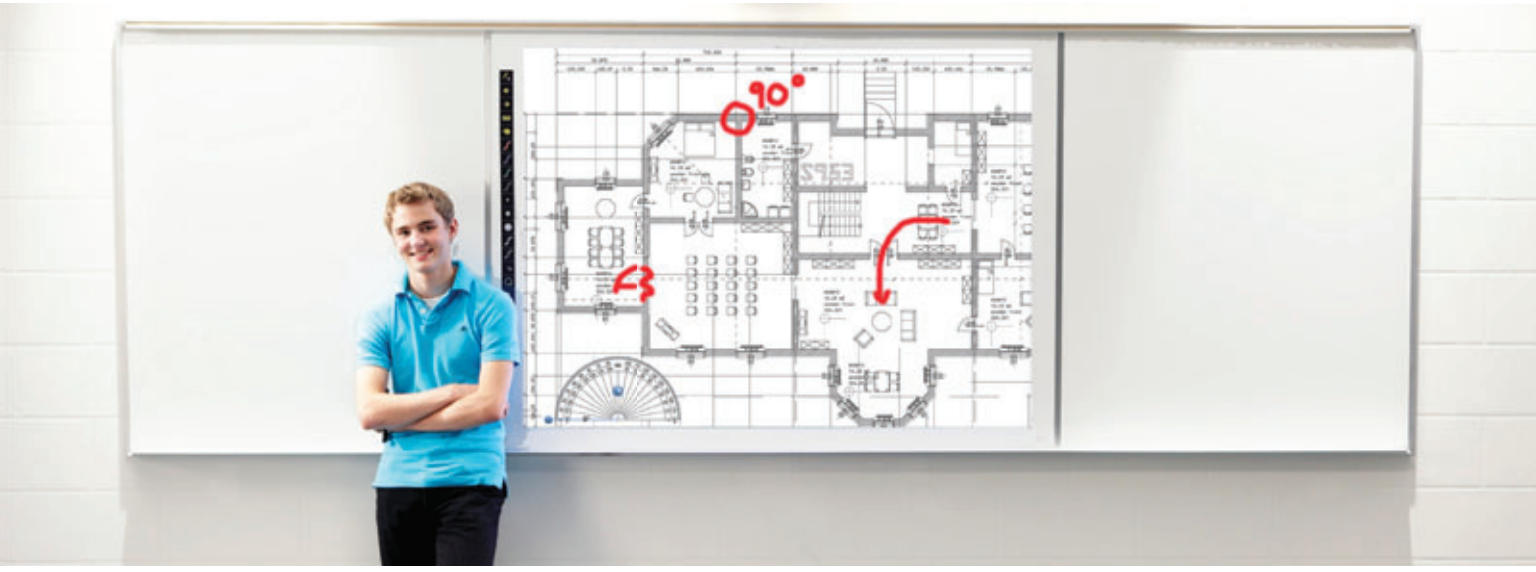

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completely transform the lives of those kids," Lowe adds.

Forming a Tablet Plan

With so many new options, and the tablet field changing so rapidly, schools are struggling to come up with a tablet plan. Joe Kurtz, director of K-12 education for CDW-G, helps school districts develop their technology strategies. He says schools are attracted to tablets for a number of reasons: They're more affordable than laptops or desktop PCs, and they're customizable—"Teachers can pull down applications that can help reinforce certain aspects or that can provide educational gains very quickly at the touch of a button." And, because the tablets lie flat on the desks, teachers no longer contend with the wall that's created when students open up their laptops.

How to pay for the devices is a big question, Kurtz says. Some schools use grants or special funding to incorporate tablets in targeted classes. Others leverage textbook budgets for tablets, opting for electronic versions of texts that are both cheaper and more easily updated. Still others replace older equipment with the less expensive tablets as part of a general IT upgrade.

Kurtz adds that many schools also consider a bring-your-own-device (BYOD) strategy to help allay the costs of a tablet program. This way, schools buy enough tablets to ensure that all the kids have access to the technology, but they don't have to outfit the entire student body.

"What we've seen is that a lot of districts are actually going out and surveying the parents to see what they have before they go down the BYOD road," Kurtz says. "They're really trying to include the community and their constituents before they make that decision because platforms are always a hot topic."

Nonetheless, using a mix of student-owned and school-owned devices presents a few challenges. Schools have to make sure the devices students bring are secure and, despite efforts to coordinate with parents, getting all the students on the same tablet OS is easier said than done.

Tablets are more customizable than PCs or laptops. "Teachers can pull down apps very quickly at the touch of a button."

Supporting Tablet Use

One school that has gone the other route by requiring its students to all own the same device is **Palmer Trinity School**, a college prep school in Florida. According to Gus Sabogal, director of technology, the student body began transitioning from Lenovo laptops to Lenovo tablets in 2006.

Palmer Trinity prides itself on being innovative, Sabogal says, and tablets are one of the school's elements that represent the cutting edge. Along with other things, the school "wanted to find ways to save some paper printing," he adds. "We were printing documents constantly."

Within a year of introducing its tablet program, Palmer Trinity saw decreases in the costs of ink, paper, and printer repairs. At the same time, the school also discontinued its use of whiteboards. Now, "everything is done through wireless projectors on the screens with handwritten notes from the instructor," Sabogal says.

While students are required to buy their own tablets, Palmer Trinity supports their use in several ways. Sabogal's department provides training for the teachers, so they can take advantage of new opportunities that tablets provide, and it provides training for the students on "how to handle the computers and how to deal with the damages," Sabogal says, "because they're going to damage them. They're going to drop them, they're going to spill liquids, and they're going to break them."

That's why Palmer Trinity is a "self-maintainer" of the tablets, providing repairs and maintenance through the school.

Schools considering a tablet program have to ask themselves what they'll do when the machines break, Sabogal says.

"We've learned through experience that the parents don't want to do repairs," he adds. "If it's going to become a problem, then it's not going to be effective."

Still, Sabogal notes that tablets have injected some excitement back into the use of technology in the classroom that had waned after several years of laptop-based instruction. He also points out that, while the curriculum has been developed to incorporate tablet use, students aren't on them all day every day.

For now, choosing a tablet is largely about determining your school's needs. Do you want to invest in one standard device for the entire campus? Do you have specific applications that your students must access? Will you need to provide technical support for your school's tablet program, and do you have the wireless network to support it? How are you going to pay for the program? These questions, rather than cost or form, are likely to be the deciding factors when you choose a device. And sooner or later you're going to have to ask them, because the tablets are coming. the

RESOURCES

For links to the products and vendors mentioned in this article, visit *thejournal.com/0112_productfocus.*

Michelle Fredette is a freelance writer who lives in the Pacific Northwest.

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PROFILE

JEREMY SHORR, SUPERVISOR OF INSTRUCTIONAL TECHNOLOGY, MENTOR PUBLIC SCHOOLS, MENTOR, OH

>> RIGHT PLACE, RIGHT TIME

I got into this by accident. My undergraduate degree is in linguistics, and I have an MBA. While I was in college, my summer job was working at my high school installing the new computers. After I graduated, I started working at that school full-time and, as is common in every district with tight budgets, people begin taking on roles that weren't traditionally theirs. The superintendent started having me work with different groups of teachers to analyze data on technology, and that's when I started seeing how it could really have a direct impact on education. I've been hooked ever since. I didn't have any intention of staying in the field after I finished graduate school—at this point it would be tough to get me to leave.

>> WORKING SMART

Before I got here, the superintendent purchased interactive whiteboards for every classroom in the district. At least initially, though, many of the teachers were using them as fancy chalkboards. One of our earliest pushes was working to expand the use of those boards and find ways to more directly attach them to the daily instruction. That was a matter of taking existing technology and finding ways it could be useful.

>> NOT A TOY STORY

I used to focus on finding the latest "toys"—technology that not a lot of other districts have. The biggest change since I've moved into this position is that we have become very big on not purchasing technology just for technology's sake. We find the need—the area in which a number of students are struggling with on assessment—and we look for technology that works with that issue.

>> THE KEY QUESTION

Any time we look at a new piece of technology, I'm always asking how it will help students become successful. That sounds like common sense, but in my experience a lot of districts aren't doing that. If it's not either making the teacher's life easier so that he or she has more time to work with the student, or having a direct and positive effect on student achievement, it has no place in the school. Teachers are overburdened as it is. Similarly, we are constantly evaluating our existing technologies. Even if we've spent $30,000 on an initiative, if we implement it and over time the data shows no positive effect, despite that big sunk cost, we will not stay with it. The students' and teachers' time is better served in some other form of instruction.

>> PEOPLE SKILLS

My first few months on the job, I made the mistake of walking in and bullheadedly telling teachers, "This is how things should be done." It didn't work very often. The superintendent pulled me aside as I was expressing my frustration and she helped me grow in that area, and I haven't had a lot of issues since. There are different approaches for different teachers, but it boils down to proving the value to technology before you even start. You talk about specific experiences with teachers in the district, how the technology might reach students, and you make sure teachers understand that nobody is trying to tell them how to do their job; we're here to provide support. You let them discover it for themselves, and follow that up with assurances that we're going to be looking at the students' achievement and that if they try this out and it's not helping, nobody is going to force them to continue.

>> WHAT IT'S ALL ABOUT

I'm here for the same thing that the teachers are here for: those moments when you can make a breakthrough with a student—whether it's a student who's struggling, a student who has all the standard concepts and is just bored, or anywhere else in the spectrum. When you can make a breakthrough with a single student, it's worth every minute of every day that you spend. the

MY TOP 3...

PATHWAYS TO SUCCESS IN INTEGRATING NEW TECHNOLOGY

Determining What Is Most Important "How will the technology be assessed, free of bias, to assure teachers that it is helping students?"

Understanding the Entire Initiative "How will we provide the tools, knowledge, and ongoing support to the teaching staff?"

Assuring Everybody Is Moving Forward "How will we develop a collaborative culture amongst the staff, including administrators, to show we are all in this together?"

Daniel Hertzberg

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