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September/October 2011 Vol. 39 No. 2

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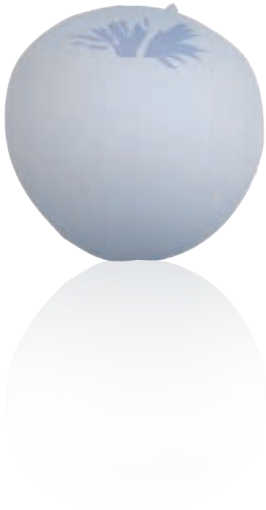

LEARNING CONNECTIONS

LEADING CONNECTIONS

PRODUCTS & SERVICES

L&L
Volume 39 Issue 2

ISSUE ORIENTED

Excellent Educators Everywhere

The core skill of innovators is error recovery, not failure avoidance.
—Randy Nelson, former dean of Pixar University

By Kate Conley

Kate Conley is ISTE's periodicals director and the editor of L&L. *Her first career was as an English teacher in the San Francisco Bay Area. She holds a master's degree in journalism and a bachelor's in English. Conley has been with ISTE for more than 10 years.*

What makes educators excellent? Is their excellence in the eye of the beholder, a.k.a. the student? I know I had several teachers I thought were excellent: Carol Pizzo at Convent of the Sacred Heart, who taught me to love literature; Henry Mayer at Urban School of San Francisco, who taught me how to think critically—not judgmentally; and John Williams at University of the Pacific, who taught me how to write.

What does an excellent educator look like? Well, you can look at any of ISTE's 2011 awardees. Clearly, teachers like Adam Bellow, the 2011 Outstanding Young Educator of the Year, have characteristics such as curiosity, creativity, and innovation. Read about him and others in Diana Fingal's article on page 12. You can also see excellent educators at work online, including John Hunter, whose TED Talk, "World Peace & Other 4th Grade Achievements," is nothing short of inspiring. You can watch others in action at ISTE 2011 on ISTE's YouTube channel or via our video-on-demand page. And don't forget the many excellent educators who contributed articles to this issue.

As you can see from these few examples, excellence comes in many forms, and one does not need to be excellent at everything to be considered an excellent educator. In fact, as Randy Nelson's quote above implies, it really boils down to fearlessness. Some of the other characteristics excellent educators have in common are that they:

- Provide students with rich learning environments where they can engage, explore, and exchange
- Are themselves lifelong learners
- Respect their students
- Share their expertise with colleagues
- Have passion for their subject matter
- Help students discover their own reasons for wanting to learn

And, of course, an endless supply of patience and perseverance—and tissues and hand sanitizer if you're a preschool or elementary school teacher—don't hurt either.

Taylor Mali in his 1999 spoken word poem-turned-YouTube-phenom, "What Teachers Make," says it well:

> You want to know what I make? I make kids wonder. I make them question. I make them criticize. I make them apologize and mean it…. Teachers make a … difference.

Resources

ISTE 2011 videos: www.youtube.com/user/istevideos
ISTE Awards: iste.org/awards
ISTE Video on Demand: isteconference.org/ISTE/2011/glance/video_on_demand.php
John Hunter's TED Talk: www.ted.com/talks/john_hunter_on_the_world_peace_game.html
Randy Nelson: www.youtube.com/watch?v=QhXJe8ANws8
Taylor Mali: http://taylormali.com

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POINT/COUNTERPOINT

Is Cursive Writing Worth Teaching?

Yes

Each year, more than 1 million visitors come to the Rotunda of the National Archives Building in Washington, D.C. They come primarily to see three hand-written documents: the Declaration of Independence, the Constitution, and the Bill of Rights. Most visitors know generally what the centuries-old parchment pages say, because they have studied their contents in school. But, on a recent morning, we overheard a girl of about 6 years old telling her parents as they stood in front of the case displaying the Constitution, "It is so pretty. I can't wait to learn cursive. I really want to know what it says." In those three sentences, she articulated many of the reasons why cursive writing is still worth teaching.

Lee Ann Potter

First of all, she recognized the beauty of script. Obviously we all appreciate it, or software companies would never have come up with the hundreds of fonts to make our typing appear more attractive. Her observation that it's so pretty reflected her

No

Teaching cursive is obsolete. If the goal of writing is communication, then the tool that is used to communicate should not be the focus. The act of communication is the focus. Whether you use print, cursive, or type is not paramount. As educators are mandated to teach more and more information, knowledge, and skills in a 21st century format, some older skills need to be laid to rest. Cursive is one of these skills.

Indiana has already abolished the instruction of cursive, and California mandates it only in grades 4 and 5. And with good reason. Electronic signature software is improving. Most students have access to computers and handheld technologies, such as smartphones. We can teach fine-motor skills in a myriad of other ways, including finger games (such as coin flipping) for dexterity, cutting and pasting, stringing beads, or using manipulatives. If a student demonstrates issues with print, referral to the district occupational therapist for assessment might be warranted.

Sharon Eilts

awareness that learning cursive is an artistic skill. As with most visitors, she likely paid particular attention to the signatures that appear on the charter documents. Not only is each pretty in its own way, but each also reflects attributes of the signer's personality.

Second, the 6-year-old sage acknowledged that learning cursive is a milestone on the path to becoming a grown-up. Her expression that she can't wait revealed her recognition that learning cursive is an attainable skill. Her optimism left no room for complaints that deciphering is too difficult or that using fine-motor skills is too challenging.

Third, she knew that when you learn to write cursive, you learn to read it too. Her desire to know what it says signaled her understanding that learning cursive is a practical communication skill that will enable her to both convey her ideas (without an electrical device or satellite) and make sense of those penned by others in the past, present, and future.

Learning cursive is a practical communication skill that will enable her to both convey her ideas and make sense of those penned by others in the past, present, and future.

Although the young girl did not mention it, the mere fact that her parents brought her to see the Charters of Freedom suggests a fourth reason why cursive writing is worth teaching. This reason does not have to do with the acquisition of a skill but involves instead an important ability. Learning cursive contributes to our capacity to imagine. A handwritten document is evidence of a specific moment in time when a fellow human being put pen to paper. Although the document cannot actually transport us back in time, it can connect us to that moment in a very tangible way. This is true not only for the big and famous documents, but for the small and seemingly insignificant ones as well.

Finally, if we do not teach students cursive writing, large portions of our collective past will literally be inaccessible to them. Untyped words will be unintelligible and cease to have meaning. Lessons that might have been learned and inspiration that might have been found will be lost. We are all stewards of information, and, as educators, we play a vital role in preparing our students for the stewardship roles that they too will play. Teaching cursive is an important component of this preparation.

—Lee Ann Potter is the director of education and volunteer programs at the National Archives and Records Administration (NARA) in Washington, D.C. She and her team (Stephanie, Michael, Megan, Becky, Dave, Judy, Denise, and Missy) discussed and wrote this response together.

As a special education teacher, it pains me to see students who are able to multiparagraph compositions but are unable to put pen or pencil to paper to write more than a sentence. Are we not supposed to give weight to content? What about those students who, because of some physical, learning, or cognitive challenge, are literally unable to write? Speech-to-text software allows these students to access the curriculum. Should they be penalized on some arbitrary standard because they are unable to write in cursive? I do not think so.

Many who remember the hours they spent practicing cursive skills wax poetic on this subject. I remember it too. The significant portion of my school year that I spent learning flourishes and circles, trying to link in my mind what I learned as print on paper and page to what I needed to learn for cursive, making sure there were no reversals, and practicing loops and lifts, were hours I could have been working on other skills. I could print quite well. Why did I need to learn how to write all over again? What other skills, abilities, or knowledge could I have learned or expressed in that amount of time?

The significant portion of my school year that I spent learning flourishes and circles, trying to link in my mind what I learned as print on paper and page to what I needed to learn for cursive, making sure there were no reversals, and practicing loops and lifts were hours I could have been working on other skills.

If we as educators are to maximize student learning, support Universal Design for Learning and access to curriculum for all, and prioritize instruction, then we need to accept that some skills should be moved to the realm of nostalgia and that the tools for those skills should be relegated to collections and museums. Inkwells are now gone from student desks. Fountain pens are novelty items. Cursive instruction, although lovely and a reminder of earlier times, has no place in modern education. We need to look forward, not backward.

—Sharon Eilts teaches special education to middle school students with autism and provides assistive technology assessments and trainings to local school districts. She is an Adobe Education Leader, Apple Distinguished Educator, Google Certified Teacher, HP Teacher Mentor, and Intel Teach to the Future Master Teacher.

To contribute to this and future discussions, go to *L&L's* group page on the ISTE Community Ning at www.iste-community.org/groups/LandL.

L&L wants your opinion!
Send comments to letters@iste.org.
Participate in our reader poll at iste.org/LL.

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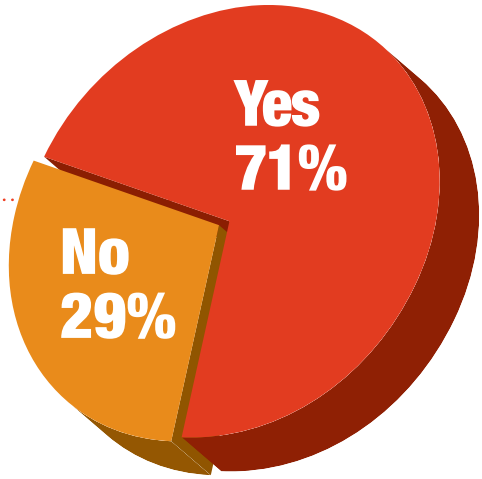


Is Cursive Writing Worth Teaching?

Although most poll respondents vote in favor of teaching cursive, many commenters think class time is better spent on more practical pursuits.

Global Communication Skill

Four or five times a week, students will be reading a book and some of the text will be in cursive, which they cannot decipher, and they need me to interpret it. If we don't teach them this skill, we are not preparing them for their future in a very global society, where most cultures predominately use a type of cursive handwriting.

Suzanne Livingston
Second Grade Teacher
West Palm Beach, Florida, USA

Waste of Time

Cursive is, for the most part, a waste of time. I stopped using cursive the second I was allowed to. There are a lot more important things we should be teaching our children other than making their words look pretty. Education needs to be about teaching practical things.

Ben Marshall
Education Student
Bowling Green, Ohio, USA

Prepare for the Future

The utility of cursive should not be an issue. Teaching cursive is a great way for a student to develop fine motor skills. At one time, cursive was taught before printing, because it developed rhythm and flow in hand motion. It is important to expose students to a variety of experiences that challenge various aspects of their minds, so that they have a point from which adaptation can start as they encounter an unpredictable future.

Joel Fox
Retired Professor
Lady Lake, Florida, USA

Going, Going, Gone

There is not enough time to teach cursive with the right emphasis. When I taught third grade, cursive was a requirement. Then I moved to fifth grade and found there was no use for cursive. Papers were typed, and students were not allowed to write in cursive on the state test. It is becoming more obsolete in the "grown-up" digital world, and there are more important skills that teachers have to focus on.

Angela de Guzman
Teacher
Reistertown, Maryland, USA

Child's Play

My son recently finished kindergarten at a French school in the U.S. and loved working on cursive. It is taught at an earlier age in the French system to help students develop not only fine motor skills, but concentration and a sense of mastery. This being said, I don't see him needing to utilize this style of writing as he grows older. Not only does technology make this easier, most adults I know write in print or block letters so their ideas and thoughts are actually legible.

Melinda Kolk
Vice President, Tech4Learning
San Diego, California, USA

Digital Age Angle

The tech aspect of this is creating a program and trackpad that would allow students to practice at home and post their work to online learning environments.

John Moody
Career and Technology Education Teacher
Asheville, North Carolina, USA

No Longer the Fastest

I have been promoting dropping the instruction of cursive from our curriculum for over 15 years. Cursive writing was developed as a faster way to put words on paper. Today students are printing; typing on computers, smartphones, and iPads; texting; podcasting; and using voice-to-text.

Craig Nansen
Director of Technology
Minot, North Dakota, USA

Ancient History

I think it should be taught. Left-handed students should also have their knuckles hit until they learn to write right-handed. Just kidding. Beyond a signature, I think cursive is a relic of a horrible past.

Steven Wells
Comment on the ISTE Facebook page

Unrecognizable

Cursive doesn't work as well with handwriting recognition devices, and moving forward most communication will be device dependent.

Easy IEP Help
Comment on the ISTE Facebook page

Technological Workaround

I have an adult child with a learning disability. Two things he never mastered were committing his multiplication tables to memory and cursive handwriting. Both are easily overcome through technology.

Kathleen Kosobud
Comment on the ISTE Facebook page

Webinar Season Begins

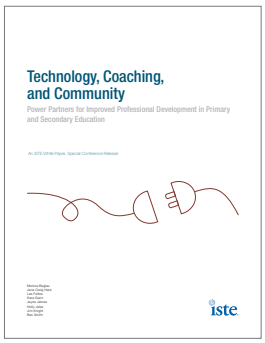
Make the most of your professional development (PD) dollars by buying an all-access pass for ISTE's 2011–12 webinar season.

These 34 one-hour PD sessions are presented by nationally and internationally recognized education thought leaders, authors, and educators. Topics include web 2.0 tools, digital storytelling, techology integration, and project-based learning.

For the cost of a single connection, you can bring in as many teachers, administrators, media specialists, or curriculum developers as a room can hold! Gather your colleagues, set up a projector, and view the webinars together.

The season begins September 14 and runs through May 23. Unless otherwise noted, the webinars take place Wednesdays at 1 p.m. Pacific time. Season pass holders have access to the archives to watch at their convenience.

ISTE members can purchase a season pass for $795. Visit iste.org/webinars for details.



Coaching Standards, White Paper Released

ISTE has added to its suite of technology standards with the release of the NETS for Technology Coaches (NETS•C), which focus on the transformation of professional development for a new digital generation.

ISTE unveiled the standards at its annual conference in Philadelphia in June in conjunction with the release of the coaching white paper "Coaching, Technology, and Community: Power Partners for Improved Professional Development in Primary and Secondary Education."

In addition to case studies, the paper includes tips for leveraging technology, coaching, and community; recommended next steps; and a first look at the details of the NETS•C (see "Technology, Coaching, and Community" on page 48). Download the coaching white paper at iste.org/learn/coaching-white-paper.aspx.

ISTE 2011: Video on Demand

If you weren't able to attend ISTE 2011 or did attend but want to review sessions or conference highlights, here are two easy ways to find ISTE 2011 video content on demand:

Conference sessions. To view more than 50 full-length sessions on topics ranging from media tools to school reform to project-based learning, go to the Video On Demand page on the conference website (isteconference.org/ISTE/2011/glance/video_on_demand.php).

Conference highlights. Find keynotes, attendee reactions, and recaps of some of the most popular activities at the conference on ISTE's YouTube channel (youtube.com/istevideos), and look for the ISTE 2011 playlists organized by day. While you're there, be sure to check out ISTE's new music video, "Say Hey (I Love School)," which was unveiled at the conference and features some amazing students from a Philadelphia school.

ISTE Collaborates on Horizon Report

ISTE was a collaborator on the New Media Consortium's (NMC) "Horizon Report: 2011 K–12 Edition." The report identifies emerging technologies likely to have a large impact on teaching, learning, research, and creative expression within education around the globe.

The Consortium for School Networking (CoSN) also collaborated on the research for the K–12 edition, which you can download at iste.org/learn/horizon-report.aspx. Find the full Horizon Report at http://wp.nmc.org/horizon2011.

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Harness Your Energy for Advocacy

VOICES CARRY

By Hilary Goldmann

Hilary Goldmann, ISTE's senior government affairs officer, has 20 years of experience in public policy and advocacy. Her column appears in every other issue of L&L.

ISTE 2011 in Philadelphia was a hive of activity. More attendees participated in advocacy activities than ever before. Even Philly's mayor took part in our Voices Carry photo petition. ISTE members sent more than 3,000 emails to Congress and created nearly 200 video messages to show why ed tech matters (see Resources). Attendees really made their voices carry!

Now we must harness that energy and use it throughout the coming year. Our collective advocacy paths must continue to grow, intersect, and support each other. Whether you are a seasoned veteran or just getting started in advocacy, there are many ways to stay connected with ISTE and be an active participant. The stakes are just too high not to be involved. Budget cuts at federal, state, and local levels are targeting classroom technology, the Elementary and Secondary Education Act reauthorization has yet to be reauthorized, and broadband connectivity is not where it needs to be. Government officials are demanding that schools implement online assessments and collect and interpret data, all of which requires state-of-the-art infrastructure, professional development for teachers and administrators, and improved digital literacy skills for students.

I encourage you to make a commitment to step up your involvement in advocacy. A first step would be to attend a town hall meeting or other constituent gathering and ask a question or make a comment about the importance of classroom technology. Congressional staff tell me it is important that education advocates be heard during these state and district gatherings, as all too often, other issues and interest groups hold the stage. Additionally, it is an easy way to make personal contact with a policymaker without having to plan the logistics of the meeting. Go to www.house.gov or www.senate.gov to find your policymaker's website and phone number. Call the local office and ask for the schedule of town hall meetings and other constituent gatherings. Consider attending an event with some of your colleagues, and turn it into a fun outing.

ISTE's advocacy webpage has many resources and activities. One of our newest is a congressional website scavenger hunt. The purpose of the hunt is to help you get to know your policymakers and to better understand how Congress works. Spend a few minutes viewing ISTE's Advocacy Tip videos and join the Voices Carry Advocacy Ning group, a forum to share experiences and learn from each other to become stronger advocates. Please join and post a comment or a question. ISTE also has an advocacy advisory group that meets monthly via teleconference. If you're interested in participating, please email me at hgoldmann@iste.org. And, of course, keep those letters coming to Congress through the Ed Tech Action Network (ETAN).

Resources

ETAN: www.edtechactionnetwork.org
ISTE's advocacy webpage: iste.org/advocacy
ISTE's advocacy YouTube channel: www.youtube.com/user/ISTEadvocacy
Voices Carry Advocacy Ning group: iste-community.org/group/isteadvocacy
Voices Carry Photo Petition: www.flickr.com/photos/64050992@N04

The Remedy for Bored Teachers? Engagement and Trust

It's no secret that kids often find school boring. It's not so commonly understood, however, that teachers often find school boring too. Bored teachers conduct boring lessons that bore students to tears. No engagement = disruptive students and frustrated teachers.

In her post "Re-engage" (http://lynhilt.com/reengage) on The Principal's Posts blog, Lyn Hilt writes that it is just as important to keep educators engaged as it is to make learning exciting for students:

> How are we making sure our teachers aren't bored? Boredom can lead to a sense of complacency, where a teacher feels comfortable delivering the same lessons year in and year out, in a manner in which they've always done so. Are any of us okay with that?

She goes on to suggest ways that administrators can keep teachers engaged:

> Simple acts like sitting down with teachers to discuss their future goals, finding out what they're passionate about, and with which colleagues they would like to collaborate, … inviting them to explore alternative avenues of learning, such as through Twitter and attending #edcamps, helping them see that the role of educator is far more complex than a person with a teacher's manual stationed at the front of the room.

The post drew this comment from Gary Anderson:

> Amen to all that. Discipline problems for students are usually tied to boredom. Poor morale among teachers is usually tied to a lack of trust, which results in a certain kind of entropy—which frequently leads back to that boredom for the students.

Anderson's comment brought to mind a post written by Mary Beth Hertz on her blog Philly Teacher. In her post "Freedom to Learn: Trust Me *Please*" (http://tinyurl.com/69jel4w), Hertz writes about her struggle against canned curricula and her desire that teachers be trusted to create their own curricula because they know the best way to reach their students:

> Of course, we still need to have an agreed upon idea of what we think our students should know. The issue is figuring out how to get there. To me this is the magic of writing a curriculum that meets the needs of your students. It's not a fixed document; it is fluid and can be revised. It is not paired to a textbook or a reading series. It is a loose framework that acts as a map to help us navigate through the school year and move our students toward the larger essential questions and understanding that we want them to have.

Five readers commented on the post, including Rita Sorrention, who wrote:

> I have witnessed curricula vary from almost none, to guidelines, to scripted lessons. I applaud the many teachers who resist being the pawns of politicians' agendas and continue to teach "children," their utmost mastery objective. Curiosity, wonder, and passion are not guaranteed rights of teaching and learning in many classrooms. But for those teachers, parents, and administrators who do foster these components, it definitely looks more like the path to life, liberty, and the pursuit of happiness than the "canned curricula" purchased to help teachers raise test scores.

Steven Beercock responded:

> The sensitivity and creativity required of a teacher to model a course according to his/her style of teaching and the needs of that particular class should be respected; otherwise why should they employ us? Robots really could replace teachers if that were the case.

Cathy Brophy commented:

> Students often learn so much more than tests or quizzes show. Let's find ways to show that no matter what the canned curriculum promises to "fix" or "teach," it is still the teacher in the classroom that has the greatest impact on learning.

We write a lot in *L&L* about how to turn students into creative problem solvers and lifelong learners. They must be engaged, trusted, empowered, and allowed to fail. Maybe it's time we offer the same to our teachers.

Diana Fingal is the senior editor for L&L. *She has been writing for and editing periodicals for more than 20 years.*

By Diana Fingal

Excellent Educ

ISTE's award winners exemplify what it means to be innovative, engaging, and connected.

It isn't difficult to find excellent educators among ISTE's membership. After all, people who join ISTE tend to be some of the most innovative teachers in the world. What is difficult is selecting the best from the vast pool of teachers, technology coordinators, administrators, library media specialists, and teachers in training. Each year dozens of judges are charged with that task—poring through scads of award applications and selecting those who rise above the rest.

We'd like to introduce you to the best of ISTE and share what makes them great, because learning from each other is the ISTE way!

Bijal Damani, ISTE's 2011 Outstanding Teacher

ators

The Outstanding Teacher Award honors a teacher who has improved education through the effective use of technology.

Bijal Damani, Outstanding Teacher

Higher secondary teacher specializing in business education, S.N. Kansagra School, Rajkot, Gujarat, India

It's hard to encapsulate the single project, idea, or characteristic that sets Damani apart. Colleagues boast about her focus on the whole child and teaching through project-based learning. Perhaps the best example of this is the Galaxy Bazaar, a project she started with her high school commerce students in 2005. That first year, 29 students organized and put on a huge bazaar at the school and made about 8,000 rupees (about $177 in today's U.S. dollars) of profit, which they donated to charity. The project has grown substantially since then. Last year, the project earned 400,000 rupees ($8,888).

Students sell gifts and food and run a game zone where bazaar-goers can play laser tag and other games. Students work all year planning and organizing the event and even sign on sponsors. They create promotional materials, work with wholesalers, contact the media, and manage dozens of other behind-the-scenes tasks that not only make the event a success, but also teach students volumes about commerce. They donate the money to a charity that educates underprivileged children in the city.

Damani uses technology in every aspect of teaching. Her school website is packed with resources for both students and their parents. Her students create e-portfolios, use digital cameras to illustrate their perspectives of the world, and use Google Docs and Spreadsheets to share their mock investment portfolios.

What her nominator says: "The characteristic of an outstanding teacher is the ability to make the moment of learning exciting and creative, a moment never forgotten. This happens through the infusion of one's own excitement and acquired knowledge into the process of learning. Ms. Damani is extremely creative and converts social networking media like Facebook into an educational and collaborative tool, helping and guiding the students on the correct usage." *—David Morris, India Council for Integral Education*

What her colleagues say: "Gifted with an innovative mind, Bijal always looks for solutions and ways to draw out the best from her learners. Over the years, I've been a witness to many such practices. Her pioneering work in integrating ICT in the classroom began with the e-classroom. She has also successfully encouraged all her students to develop e-portfolios of their own, thus gifting them with the most crucial ICT skills needed by 21st century learners." *—Sujata Kini, English teacher, S. N. Kansagra School*

What the judges say: "Her integration of project-based learning, her concern for each individual child, and her bringing together of social activism with entrepreneurship is very powerful."

What she says: "Each child is a unique individual having various talents and skills. Teachers have to identify and tap the latent potential within each child. I believe in development of the 'whole child'—the physical, intellectual, and spiritual."

Learn more: https://sites.google.com/site/bijaldamanisclassroom

Monica Beglau (right), ISTE's 2011 Outstanding Leader, is pictured with ISTE Board President Holly Jobe.

The Outstanding Leader Award goes to an administrator—at the school, district, state, or national level—who improves education through the effective use of technology.

Monica Beglau, Outstanding Leader

Executive director of eMINTS (Missouri Instructional Networked Teaching Strategies) National Center, University of Missouri, USA

Monica Beglau is all about bringing educational technology to the masses. She is executive director of Missouri's eMINTS Program, an intensive two-year technology professional development program designed to help teachers learn how to integrate a specific suite of technology into their classrooms using instructional strategies that promote inquiry-based learning and encourage collaboration and community building among students and teachers.

Colleagues laud her for her ability to forge partnerships with businesses and other organizations to stretch dollars and extend programs to reach more students.

In addition to her role with eMINTS, she oversees eLearning for Educators, a self-sustaining online professional development program in Missouri that has trained more than 1,200 teachers.

As if that weren't enough, Beglau is the project director for a $12.2 million Investing in Innovations (i3) grant, awarded to the University of Missouri to implement eMINTS at 60 middle schools in the state.

What her nominator says: "Dr. Beglau's entire career has been focused on the effort to improve the quality of education for students. She views the eMINTS Program as a way of leveling the playing field for students who may be at a disadvantage." —*Cathie Loesing, program coordinator of eMINTS National Center*

What her colleague says: "Monica's work at the state, national, and international levels has made a significant difference in the educational opportunities students are offered through technology in their schools. Monica was an early advocate for the ISTE NETS. She promoted changes in state and national standards for the instructional use of technology to mirror the ISTE standards. Her strong beliefs about the role technology can play in supporting student achievement have translated into changed educational practices." —*Barbara Treacy, director, EdTech Leaders Online*

What the judges say: "Impressive record of facilitating the use of technology for teacher preparation programs. This nominee has also forged international partnerships."

What she says: "Schools with strong eMINTS programs are exciting, lively, and interesting places to be. Students and teachers alike are fully engaged in learning and use technology as a way to explore the world, learn new ideas, and solve real-world problems. Students in eMINTS classrooms use technology to become independent thinkers who are also active team members and creators of knowledge."

Learn more: http://emints.org

Adam Bellow, ISTE's 2011 Outstanding Young Educator

The Outstanding Young Educator Award honors an educator under age 35 who has demonstrated vision, innovation, action, and transformation while using technology to improve learning and teaching.

Adam Bellow, Outstanding Young Educator

Director of educational technology for College Board Schools, New York, New York, USA

Adam Bellow is a tireless advocate for sharing. He has invested countless hours—and dollars—putting together a comprehensive website chock full of resources for K–12 teachers. His site, eduTecher.net, groups thousands of websites according to grade level and subject matter. But it's not just a list of links. The site allows teachers to keep a backpack of resources that they can categorize, annotate, and share with friends. He also posts video tutorials.

But that's technically just his hobby. His real job is director of technology for the 17 low-income schools on the East Coast of the United States that are designated as College Board Schools. Although some district-level technology directors seldom walk into a classroom, Bellow loves to meet with teachers, listen to their ideas, and suggest ways that technology can improve their lessons. His favorite thing, he says, is to find an educational use for a technology that was not originally designed for education.

What his supervisor says: "Adam is a key addition to our team in so many ways. He is a true collaborator and solution seeker and has a highly developed sense of humor that serves to better the dynamics and health of our team and the College Board as well. Early on in his employment at the College Board, Adam co-led a technology project with our Advanced Placement division that has proven to be highly successful and may lead to a new and interesting project in support of AP students." *—Helen C. Santiago, vice president of College Board Schools*

What his colleague says: "Adam is like no other administrator I have met. He is a responsive, caring, dedicated person and a most patient teacher. Adam is what I think of when I hear the term *lifelong learner*. He puts students and teachers first and helps thousands of people every day. It is because of Adam, his website, and his hard work as director of educational technology that I am able to do a lot of the great projects I am doing with my students. He has made a tremendous impact on my colleagues, myself, and the culture of our school." *—Marie Cooper, teacher*

What the judges say: "Adam is the ideal young educator for ISTE to showcase—knowledgeable, helpful, eager to share what he knows both through the hundreds of teachers he supports each day in his job and with the thousands of educators who access his eduTecher site."

What he says: "Learning how to use all the wonderful technology available today opens up worlds to our students and new avenues in which to reach and teach them. Learning how to use the tools responsibly and safely is the key to making it all work. I am never satisfied walking away from the educational buffet of tools, resources, and content out there because there is always something to learn and share with others in order to help teachers reach their students using successful integration of instructional technology."

Learn more: www.edutecher.net

And the 2011 ISTE Award Winners Are...

Outstanding Teacher: Bijal Damani, S.N. Kansagra School, Rajkot, Gujarat, India

Outstanding Leader: Monica Beglau, executive director of eMINTS National Center, Columbia, Missouri, USA

The Outstanding Leader and Outstanding Teacher awards honor individuals who have demonstrably improved education through the effective use of technology.

Outstanding Young Educator: Adam Bellow, director of educational technology, College Board Schools, New York, New York, USA

The Outstanding Young Educator Award honors an educator under 35 who has demonstrated vision, innovation, action, and transformation while using technology to improve learning and teaching.

Emerging Leaders: Caroline Haebig, social studies educator, Bradford High School, Kenosha, Wisconsin, USA; Josh Stumpenhorst, sixth grade social science and language arts teacher, Lincoln Jr. High School, Naperville, Illinois, USA; Crystal Beach, English teacher, Lakeview Academy, Gainesville, Georgia, USA; Merry Willis, teacher, Carmel Elementary School, Woodstock, Georgia, USA; and Ashley Talley, special education teacher, Eaton Elementary School, Lenoir City, Tennessee, USA

Emerging Leaders are young educators who are leaders in technology integration.

Public Policy Advocate: Becky Fisher, representing Virginia Society for Technology in Education, Greenwood, Virginia, USA

Public Policy Advocacy Trendsetter: Michael Walker, representing Technology Information Education Services, Minneapolis, Minnesota, USA

The Public Policy Advocate awards recognize outstanding leaders and mentors who advocate for educational technology policy at the local, state, regional, national, and/or international levels.

Kay L. Bitter Award for Excellence in Technology-Based PK–2 Education: Amanda Marrinan, Year 2 teacher, St. John Vianney's School, Brisbane, Queensland, Australia

The Kay L. Bitter Award honors a PK–2 educator for vision and creativity in a project or program that effectively integrates technology.

Sylvia Charp Award for District Innovation in Technology: Vail Unified School District, Vail, Arizona, USA; Kevin Carney, director of the Beyond Textbooks program, and Andy Chlup, director of technology

The Sylvia Charp Award, presented by ISTE and *THE Journal*, recognizes district innovation in technology.

SIGMS Innovation Technology Award, primary school winner: Mary Carole Strother, library media specialist, and Bryce Kennaugh, second grade teacher, Finch Elementary School, McKinney, Texas, USA, for "Maybelle the Cockroach"

SIGMS Innovation Technology Award, secondary school winner: Cynthia Cassidy, media specialist, and Michelle Cook, language arts teacher, Mount Olive Middle School, Budd Lake, New Jersey, USA, for "Who Owns History?"

SIGMS Honorable Mention, primary category: Karen Kliegman, library media specialist, and Noel Forte, technology integration facilitator, Herricks School District, Searingtown School, Albertson, New York, USA for "Survivor MD"

SIGMS Honorable Mention, secondary category: Jennifer Kelly, library media specialist, and Debbie Hague, social studies teacher, Virginia Beach City Public Schools, First Colonial High School, Virginia Beach, Virginia, USA, for "Conflict Everywhere"

The SIGMS Awards, sponsored by Linworth Publishing Inc, and Follett Software Company, honor a school librarian and collaborating teacher who have conducted an exemplary technology program extending beyond the media center.

SIGOL Learning Award, first place: Diane Heitzenrater, Stacy Rotchford, and Andrew Osborne from Hatboro-Horsham School District, Horsham, Pennsylvania, USA for "Internet Safety 101"

SIGOL Learning Award, second place: Lisette Casey and Toni Oliver-Barton from Springs School District, Manitou Springs, Colorado, USA for "We've Got Sole Manitou"

SIGOL Learning Award, third place: Janine Lim, Berrien Springs, Maryland; Sue Porter, Grand Rapids, Michigan; and Elaine Shuck, Sturgis, South Dakota, USA for "Read Around the Planet"

SIGOL honorable mentions: Saskatoon Catholic Cyber School, Saskatoon, Canada; Herricks School District, New Hyde Park, New York, USA; Blue Springs School District, Vesper Blue Springs, Missouri, USA; Henrico County Public Schools, Henrico, Virginia, USA; and Deakin University, Victoria, Australia

The SIGOL Awards, sponsored by the ISTE Special Interest Group for Online Learning, recognize creative educators for their pioneering use of online networks for students in grades K–16.

SIGTE Research Paper Award: Susan Sutton, St. Cloud State University, for "The Preservice Technology Training Experiences of Novice Teachers"

Congratulations ISTE 2011 Making IT Happen Winners

Jeanne Biddle, ISTE Board member and director of technology for Scott County Schools, Georgetown, Kentucky, USA

Scott Merrick, SIGVE chair and virtual learning curriculum specialist for Metro Nashville Public Schools, Nashville, Tennessee, USA

Dan Meyer, ISTE Board member and CEO of Atomic Learning Inc. Little Falls, Minnesota, USA

Ben Smith, ISTE Board member and physics teacher at Red Lion Area High School, Red Lion, Pennsylvania, USA

Amanda Marrinan, winner of ISTE's 2011 Kay Bitter Award for Excellence in Technology-Based PK–12 Education

The Kay L. Bitter Award for excellence in Technology-Based PK–12 Education recognizes educators for vision and creativity in a project or prgram that effectively integrates technology.

Amanda Marrinan, Kay L. Bitter Award for Excellence in Technology-Based PK–12 Education Teacher

St. John Vianney's Primary School, Manly, Brisbane, Australia

Even some of the most devout educational technology advocates haven't tried what Amanda Marrinan does in her classroom as a matter of course: She encourages her 5-year-old students to blog. She opens her classroom three days a week for a bloggers café, providing students a space where they can blog, network, learn new skills, mentor one another, and even help staff and parents.

In 2007, she connected her class with teachers and students across the world using Skype, and she has participated in global collaborative projects. One of those projects, Voices of the World (http://onevoice.ning.com), connects educators who share recordings that their students make to introduce children to languages, accents, and dialects from around the world.

Marrinan is able to engage her students in international projects due to the connections she's maintained with educators in the United States, Canada, and Australia. She also shares her tech knowledge by facilitating workshops for teachers and parents during lunch breaks and after hours.

What her nominator says: "Amanda's students participate in online, collaborative projects that support their learning across literacy and numeracy as well as develop an awareness of the whereabouts and culture of others within our global community. The children connect, learn, share, and collaborate via wikis, VoiceThreads, and video as well as through tools like Skype and Twitter. Amanda truly embodies the qualities of a lifelong learner. She is passionate about embracing technology as a way of differentiating learning for her students." *—Sheila Adams, teacher, Rye Junior High School, New Hampshire, USA*

What her principal says: "Amanda remains ahead of her time as an early adopter of innovative, creative technological advances. She has amazed me with her energy, passion, and diligence as she follows the trail of new web 2.0 tools that will enhance learning for her young students. The staff and students of St. John Vianneys have benefitted immensely from Amanda's work in promoting the use of technology in the classroom." *—Karren Strahan, prinicpal of St. John Vianney's Primary School*

What the judges say: "Amanda is truly an educator who embraces the use of technology not only to encourage her students' learning but the global community as well. She exemplifies the Kay Bitter Award."

What she says: "Learning is lifelong, and it's important to me that I model being a reflective, lifelong learner with my students. I don't consider myself the master teacher, the holder of all knowledge, and I'm comfortable telling my students, 'I don't know. How could we find out?' I strive to create a learning environment where everyone is valued as a teacher and learner, where students are given a voice, learning is negotiated, and they have a say in what and how they learn. We're on the journey together."

Diana Fingal is senior editor of L&L. *She has been writing for and editing periodicals for more than 20 years. She has a bachelor's degree in journalism from the University of Oregon in Eugene, Oregon, USA. She also taught English in a K–11 school in Yalta, Ukraine, as a Peace Corps volunteer.*

By Andrew Halter and Jeff Finch

Three R's for Digital Coaching

and Assessment

Help teachers target higher-order thinking with rigor, relevance, and rubrics.

The coaching office at Hampton High School is a busy place. One full-time instructional coach and two part-time interns from Duquesne University's School of Education are crammed into a 12' x 20' "office," along with various projectors, cameras, iPod carts, cases of student response devices and various other instructional technologies. The room acts as command central for instructional technology support in our building, with a constant flow of teachers in and out, buzzing with questions, such as "What do you think about…?," "Is there a way we could…?," and "How can I get students to…?" There's a whiteboard on the wall where we keep a list of current projects, and this year we have scribbled as many as 20 simultaneous ventures on it in different-colored markers. In a building with around 70 teachers, this whiteboard is a clear indication that business is booming!

Over the past four years, our district has made tremendous strides in technology integration. While we continue to strive to improve instructional practice, a full-time instructional coach and a buildingwide focus on assessment are helping us move forward with embedded professional support and a common vision.

Rigor/Relevance Framework

The Rigor/Relevance Framework, developed by the International Center for Leadership in Education, has four quadrants. Each is labeled with a term that characterizes the learning or student performance at that level.

Quadrant A — Acquisition
Students gather and store bits of knowledge and information. Students are primarily expected to remember or understand this acquired knowledge.

Quadrant B — Application
Students use acquired knowledge to solve problems, design solutions, and complete work. The highest level of application is to apply appropriate knowledge to new and unpredictable situations.

Quadrant C — Assimilation
Students extend and refine their acquired knowledge to be able to use that knowledge automatically and routinely to analyze and solve problems and create unique solutions.

Quadrant D — Adaptation
Students have the competence to think in complex ways and also apply knowledge and skills they have acquired. Even when confronted with perplexing unknowns, students are able to use extensive knowledge and skill to create solutions and take action that further develops their skills and knowledge.

About Our District

Hampton High School, located 10 miles north of Pittsburgh, Pennsylvania, serves 1,100 students in grades 9–12. Our district has a strong academic tradition, and more than 90% of graduates continue their education. For four consecutive years, Hampton has been ranked among the top 6% of the nation's high schools by *Newsweek* magazine and was awarded a "silver" ranking by *US News & World Report* for three consecutive years, marking it among the top 3% of U.S. high schools.

Four years ago, our district and many others in Pennsylvania received an infusion of technology from a state grant initiative called Classrooms for the Future (CFF). The grant provided plenty of equipment for our high school, including laptops, LCD projectors, and interactive whiteboards in all core classrooms. The grant also provided funding and training for a full-time instructional technology coach and required online courses for staff.

The CFF initiative began with a "ready, fire, aim" philosophy that encouraged teachers to explore new tools and approaches with the support of a coach, who acted initially as a resource provider and trainer. As time progressed, teachers began to aim their use of technology, weeding out what did not work for them and adopting and improving what did. The role of the coach also began to shift beyond just resource provider to co-planner, co-teacher, and embedded professional developer.

Role of the Coach

When Pennsylvania's Department of Education set the criteria, it asserted that the coach was to be a master teacher first and a technology person second, with the idea that the position would mature well beyond the role of tech support. In our district, this position is now a full-time instructional coach specializing in the educational process behind digital age learning. Working with teachers across disciplines, the coach has gained a unique perspective that allows him to work as a conduit for both new ideas and best practices. He works one on one with teachers daily by co-planning and co-teaching lessons and helps design and facilitate staffwide professional development.

Beyond the CFF program, our coaching initiative receives support in resources, training, and networking via our local educational service district and the Pennsylvania Institute for Instructional Coaching (PIIC), a statewide network of coaches funded by the Annenberg Foundation. This support has been instrumental in making effective use of coaching, which in turn has helped our teachers make great strides in embedding technology, rigor, and relevance to enhance student outcomes.

Focus on Assessment

In addition to our coaching initiative, for the past six years, Hampton teachers have been using assessment portfolios as a vehicle to improve the quality of instruction through the accountability of more rigorous and relevant assessment. These portfolios represent a catalog of each teacher's assessment tools mapped in real time and are used to guide and ground professional discussions, co-teaching, planning,

Working with teachers across disciplines, the coach has gained a unique perspective that allows him to work as a conduit for both new ideas and best practices.

In the past few years, teachers have been designing and implementing more effective rubrics through collaboration with the coach, who keeps them in a rubric portfolio.

observation, conferences, inservice workshops, and teacher reflection. Portfolios have also been influential in establishing more teacher and student accountability for assessment as a shared vision of what matters.

Portfolios are available for teachers' review at any time and are shared in both structured and informal exchanges. Teachers complete reflection sheets on these exchanges as a means to enhance both personal and collaborative growth. Because teachers are constantly sharing assessments and validating their curricular connections, this process allows the curriculum to remain dynamic but also common and balanced from teacher to teacher and within content areas. Curriculum is continually fluid, as teachers are constantly comparing and reviewing assessments for effectiveness. Additionally, we catalog portfolios yearly and use them to map instructional growth. We also embed a data collection tool that identifies frequency and value of "Quadrant D" elements of the Rigor/Relevance Framework in summative assessments (see "Rigor/Relevance Framework" on page 20). Find detailed assessment portfolio resources on our wiki, The Digital Shift (see Resources at the end of this article.)

Currently our work with assessment, driven by a Middle States Accreditation for Growth (AFG) goal, is focused on increasing Quadrant D assessments to improve the learning experience and increase retention through relevant applications. This goal, based on the ideas outlined in William R. Daggett's book, *Rigor and Relevance From Concept to Reality*, challenges teachers to design lessons that push students into higher-order thinking and help them find relevant connections and applications for curricular content. Daggett describes this rigorous student performance as "the ability to gather knowledge from a variety of sources to solve a complex problem." In short, we identify Quadrant D as high levels of Bloom's Taxonomy combined with relevant connections, as demonstrated through multidisciplined, real-world applications. Culminating assessments ultimately allow multiple pathways to demonstrate learning and often yield unpredictable outcomes. This project-based approach requires a facilitated process that allows students to "find their own way" to a rich understanding. As teachers review portfolios and modify assessments to hit this criteria, coaching support becomes invaluable as teachers seek to improve instruction by adopting new strategies and technologies.

Rubric Evolution

When we started our rigor and relevance initiative, we found that in addition to the creativity required to design relevant application projects, teachers also found a challenge in designing rubrics to accurately measure this level of application. They found solid rubrics to be time consuming to create, and many found it difficult to quantify and fully articulate varying levels of rigor and relevance. In many cases, scoring guides were merely checklists that students could complete satisfactorily with minimal effort. The desire was to develop rubrics that both guide and measure more meaningful performance. In the past few years, teachers have been designing and implementing more effective rubrics through collaboration with the coach, who keeps them in a rubric portfolio. When working with a teacher to design a lesson, especially summative assessments that incorporate technology, the coach usually

starts the conversation with expected outcomes and rubrics. Teacher and coach examine examples from similar projects and design a rubric to fit the desired outcomes of the project. This approach ensures that skills and performance drive the project rather than technology, and it also helps teachers see interdisciplinary connections in skills and content.

This open sharing has helped to refine project-based rubrics that more deeply reflect components of Quadrant D lessons. Rubrics began to evolve as teachers identified essential skills relative to their content areas and clearly articulated levels of application to measure student performance. Find examples of our rubrics on our wiki.

Coaching in Action

The majority of our teachers use a variety of web 2.0 and digital storytelling tools in project-based and collaborative applications that push students to demonstrate content mastery through the creation of authentic products, such as websites, teaching tools, videos, podcasts, and multimedia presentations. A good example of a project that is the culmination of both our coaching support and our assessment initiative is a modern materials project done in an honors chemistry class, now in its third year of refinement.

Three years ago, a chemistry teacher met with our coach to bump up a lesson in rigor, relevance, and digital age skills. Previously, the assessment required students to deliver a PowerPoint that presented modern uses of chemical materials. After venting the usual gripes about student PowerPoints ("They just read the text," "They aren't very engaging," "They use too much bland information and show no real mastery of content"), we discussed several options for more engaging presentations, decided on an approach that would allow students maximum creativity, and drafted a rubric that reflected our desired outcomes. We based our outcomes on curricular objectives as well as digital age skills, such as collaboration and creativity. The project that ensued challenged students to use various multimedia and web 2.0 tools to create a dynamic and engaging web resource. The goal was to demonstrate a rich understanding of chemical structure, properties, and relevant applications of the materials, such as superconductors, ceramics, and polymers. We used the final product to help the students teach the rest of the class about their assigned chemical materials.

We focused this collaborative project with a clear, relevant purpose: Teach your peers, and place less emphasis on the tools and more on achieving a level of mastery required to effectively teach a concept. Students used a wiki as a starting point for their sites and integrated text, images, graphics, video, and tools such as Animoto, Blabberize, GoAnimate, Glogster, and many others to make their sites more engaging. Teachers dedicated no class time to teaching these tools. Instead, the teacher and coach provided in-class support, with the chemistry teacher as a content resource and the coach as a tech and design resource. A coach-created student resource wiki provided tips, tools, and instructions on various web-based strategies (see Resources).

Because everything is wiki-based, the process of project-based learning became more transparent, as we were able to check and guide progress along the way. We used the wiki discussion board to provide guiding feedback, and we checked on group member contributions via the History tab. The wiki also allowed students to continue collaborative work outside the classroom. Once the projects were complete, students used the wiki to evaluate all of their peer projects as well as their individual group-member contributions using Google Docs forms.

We also spent time working together to design a rubric that reflected expected outcomes, added digital age skills, and clearly articulated a sliding scale that measured rigor of content as well as creativity, presentation, and collaborative effort. A project such as this allows students to demonstrate a thorough understanding of content, because they are required to pull in information from a variety of sources, in a variety of modes, and organize it in a logical fashion as a website as well as a presentation platform.

Over the past few years, the project has evolved because of continued planning and collaboration between the coach and teacher. Each year, after working together to plan, teach, and assess the projects, we meet to debrief about how to tweak the project for the following year. As we discover new web 2.0 tools that can help support the project, we add them to the student resource page as options. Sharing this project format as a best practice has encouraged several other teachers to integrate this process into their own instruction. It is also a good representation of how our coaching process works:

- Start with a conversation fueled by Quadrant D and focused on assessment and not a specific tool.
- Research technology resources to help push the lesson to new limits.
- Plan a lesson and design an assessment tool.
- Teach with specific purpose.
- Debrief and refine for next year.
- Celebrate successes through sharing best practices.

Moving Forward

Our coaching office whiteboard shows clear evidence of continual progress, as we update it with new projects and erase those that are sure to be revisited the following school year. Vodcasts in Algebra II, podcasts in English 10, Google Earth tours in world geography, cross-country wiki collaboration in French II, Photostory projects in Biology I, digital literacy co-teaching in English 9, and web-based curricu-

lum resources are just a handful of this year's scribblings. Our focus on assessment, combined with our staff's embrace of coaching, has helped establish a system of transparency and accountability for both teachers and students, and perhaps more important, it exists as an embedded system of professional development and real-time instructional support. This focus has also nurtured a progressive culture of best practice, creativity, and flexibility that still maintains a common ground and a fluid curriculum. As we look toward the future, we hope to continually strive for instruction and assessment that demand inquiry, integrate technology, and, most important, infuse rigorous digital age skills.

Resources

Annenberg Foundation: www.annenbergfoundation.org

Classrooms for the Future (CFF): http://tinyurl.com/6z4gyta

Modern Materials Wiki Project: http://mrceccarelli.wikispaces.com/Modern+Materials+Project+2010

Pennsylvania Institue for Instructional Coaching: http://piic.pacoaching.org/index.php/piic-home

Pennsylvania Institute for Instructional Teaching: www.pacoaching.org

Rigor/Relevance Framework: www.leadered.com/rrr.html

The Digital Shift: www.thedigitalshift.wikispaces.com.

Tools for Students wiki: www.tools4students.wikispaces.com

Andrew Halter has been an instructional coach at Hampton Township School District in Allison Park, Pennsylvania, USA, for 16 years. He has also taught secondary English and TV production and delivers technology-related professional development to districts across western Pennsylvania.

Jeff Finch has been principal of Hampton High School for nine years, and previously was an assistant principal for three. Prior to moving into administration, he was a technology education teacher. He graduated from California University of Pennsylvania.

By James D. Basham, Ernest Perry, and Helen Meyer

It's in the Bag

Digital Backpacks for Project-Based Learning

Build your own self-contained toolkits for your problem- and project-based learning experiences, complete with appropriate technology that works for every learning style.

When it comes to technology, many schools know what they want. They want targeted and scalable solutions that enhance learning and meet the NETS•S. And the teachers in those schools want simple, strategic instructional frameworks for developing their students' basic and digital age skills while meeting diverse learning needs. But as many technology integration specialists know, satisfying all those wants in every lesson is no easy task.

Undaunted, the University of Cincinnati FUSION Center set out to build a solution that fulfills all of those reqirements. We partnered with the National Underground Railroad Freedom Center and Apple to develop a toolkit that is simple, scalable, effective, and even portable. We call it the digital backpack.

A digital backpack is just what it sounds like: an actual knapsack that contains an array of digital and hardware tools, resources, and instructional materials handpicked to engage learners in project- or problem-based learning (PBL) experiences. We have designed digital backpacks for specific projects and challenges as well as for projects in particular curriculum areas.

Designed to Support All Learners

Our design is grounded in the Universal Design for Learning (UDL) framework. Based on neuroscience, UDL purposefully combines the use of technology with instructional pedagogy to support students with a range of academic abilities, disabilities, and cultural and language backgrounds. Our digital backpack design strives to align its core components with UDL principles. Each backpack provides:

- Multiple means of representation to support learner perception, understanding, and comprehension
- Multiple ways for learners to take action, express their understanding, and increase executive-level processing
- Multiple means of engagement to promote learner interest, effort, and self-regulation

Open a digital backpack, and you'll find three core components that teachers can easily adapt to increase student engagement and understanding in different curricular areas or use in interdisciplinary activities. They include:

- Foundational technology
- Modular technology
- Instructional support materials

Foundational technology. This is the hardware and software that is the core of the digital backpack. It must be flexible enough to support multiple modular technologies. Besides a well-constructed backpack, the foundational technology would include a laptop or tablet device and software or apps to access instructional content, gather data, and construct media.

Modular technology. This set of tools includes hardware, software, and devices chosen to meet specific instructional goals and desired outcomes. The modular technologies that we tested included digital camcorders, iPod touches with preloaded apps, digital sound recorders, digital science probes, measuring tape, and Pasco's Sparkvue (data-gathering and analyzing software). Other ideas include microphones and digital still cameras.

Teachers choose their technologies based on their capacity to support the individual PBL experience, and, as suggested by the term *modular*, they can add or remove a given technology from a digital backpack depending on the specific learning objectives.

It is essential for the modular technologies to be able to readily interface with the foundational technology.

When teachers purposefully embed these technologies within an instructional experience, we have found that they can increase engagement and support learners in expressing their understanding.

Instructional support materials. These include all of the curriculum resources that provide the structure, guidance, and specific information learners need to understand the content and complete the learning experience. Teachers can change or modify the instructional support materials, just as they did the modular learning technologies, based on instructional, curricular, or student needs.

In the backpacks we tested, the instructional support materials included content-specific instructional information in the form of documents, podcasts, videos, and content-based apps. You could include any digital learning objects, art, or artifacts as well as URLs for online resources and informational background articles. Our backpack designs have also included learner handouts to structure activities, such as storyboarding templates and activity instructions. Some instructional support materials provide technology tutorials for the foundational and modular technologies.

In the various digital backpack designs we have implemented, we have found the instructional support materials to be the most critical, yet often overlooked, component. The teacher's expertise and knowledge of students and their learning needs comes most strongly into play when they are preparing the instructional support materials, as that's what provides the basis for students to understand the content and complete the associated experience. It is important to include multiple means of content representation as well as ways to purposefully scaffold the actual "engaged" experience. For instance, teachers can provide the students with digital templates to help facilitate data gathering or problem solving. We have found that having students use a template to storyboard as an initial part of the backpack activity helps them stay on task and better understand the content.

We created several digital backpack variations by modifying these core components to meet different sets of curricular and instructional needs. Digital instructional support materials are particularly adaptable to different learning styles, as teachers and students can access the content multiple times, convert it to numerous languages, search it, change text color and size, auto-summarize it, or have it digitally read aloud. We also designed rich tasks to go along with the technologies that encourage multiple modes of expression and engagement. Finally, we designed the backpacks to support just-in-time learning as well as information and technology skill building through the use of various types of communication, collaboration, problem solving, critical thinking, and other executive-level skills.

Digital Backpack Field Experiences

We tested the digital backpack with multiple age groups, from kindergarten through adult, and in a range of settings.

Elementary school. A group of students in kindergarten through fifth grade participated in a digital backpack experience at a nationally ranked zoo. Their instructional task was to determine how the zoo could become more kid friendly.

Because of the age and size of these young students, some left the laptops

We designed the backpacks to support just-in-time learning as well as information and technology skill building through the use of various types of communication, collaboration, problem solving, critical thinking, and other executive-level skills.

at school during the field trip but used them to complete the lesson once they returned. At the zoo site, the students used several modular technologies to acquire pictures, video, and audio of their observations. Student teams gathered information on zoo safety and animal habitats. Many student groups interviewed other children and families visiting the zoo.

After the visit, the students used their data to develop presentations, including simulations and models using simple programs (such as drawing in Apple's Keynote or modeling in Google's SketchUp) about how the zoo could be more kid friendly. The teachers shared the presentations with zoo administrators, who implemented some of the students' suggestions. For instance, the zoo now has a life-size cutout of a giraffe for people to compare their height to.

This example demonstrates a PBL experience. The project was open ended enough for students of different ages to engage fully and at their own learning pace. The students had to define for themselves what a kid-friendly zoo would look like and, once they had a definition in mind, how to gather data about the zoo's status based on that definition.

The experience also demonstrated a number of UDL ideas. Students had to make decisions about how to gather information (videos, pictures, and interviews), how to make sense of the data (in photos or Excel spreadsheets, for example), and finally how to represent their findings to other people.

Middle school. The integrated problem-based experience for middle school students was using their digital backpacks to catalog and gather data on fossils at a nearby fossil outcrop. Each backpack was equipped with a laptop (they now have iPads) and task-specific modular technologies: camcorders, cameras, tape measures, and digital microscopes. The instructional support materials included fossil identification information and a project overview indicating they should collect digital images to catalog fossils. The students developed presentations depicting their fossils and findings and used this information to develop hypotheses for the types of habitats that existed during the time of the fossilized animals' lives.

As part of the design of this PBL experience, students were given different roles to increase engagement. Each contributed to the overall project by employing a different skill set. The student roles included team leader, data collector, data analyst, and presenter. (The National Center on Universal Design for Learning's guidelines further explain the idea of learner role differentiation.)

High School, college, and teachers. The task that high school and adult participants were assigned was creating a movie. The participants were told that a media company had hired them to develop a five-minute movie addressing the question "What is freedom?" with the Freedom Center as a backdrop. In a four-hour period, the participants used digital backpacks outfitted with a laptop and media-focused modular technologies, such as digital camcorders and cameras, to create their movies. The instructional support materials included project guidelines, project templates, and multimedia background information on Freedom Center exhibits.

Like the zoo activity, this PBL experience demonstrated the UDL principles of supporting multiple means of representation, learner decision making about information gathering and expression, and role assignments. It was a popular and effective activity that continues to be available to all Freedom Center visitors.

Build Your Own

Although digital backpacks are relatively easy to develop and implement, you should keep a few things in mind when building your own backpack. First, it is important to think through the core components you'll need using the UDL framework. How will your backpack meet diverse learning needs? Does it provide for multiple means of representation, expression, and engagement? Each of our digital backpack designs meet diverse learning needs by including multiple ways for learners to acquire content or project information, and they often contain duplicate digital files and paper documents. You can also provide links for online tools and media, such as websites, podcasts, and videos, that learners can use to gather necessary information. The problem- or project-based learning experiences you embed in the digital backpacks should also provide alternatives for learners to engage in the project and demonstrate understanding of its content.

Second, consider how the students are actually going to use the technology. To avoid large-scale retrofitting, consider which foundational technology and modular technologies will

When teachers purposefully embed these technologies within an instructional experience, we have found that they can increase engagement and support learners in expressing their understanding.

Each digital backpack contains a foundational technology as well as a variety of modular technologies and support materials that teachers can adapt for the lesson, age group, and individual students' learning needs.

provide the greatest amount of flexibility and student use. Also consider time efficiency. We quickly learned that camcorders with built-in memory were more time-efficient than camcorders without internal memory, for example. We also learned that supplying instructional materials using various media (text, audio, video) and on various platforms (paper, laptop, and iPod) led to the greatest use. And we discovered that providing and encouraging the use of digital technology supports (such as premade software tutorials) advanced just-in-time learning, independence, and problem solving.

Third, as with any lesson, you should aim to strike a balance between instructional design and instructional management. Even the greatest digital backpack and lesson design can fail if you don't give students appropriate instructional management. For instance, one problem we noted was that students wanted to develop such sophisticated products that they missed their delivery window. When designing instructional support materials, consider including support for project management. It's important to include project goals, timelines, and planning templates.

We encourage a backward design process infused with the UDL framework for creating backpacks to fit your needs. This process starts with the desired learning outcomes and then moves through designing specific tasks and determining the resources you need to facilitate these outcomes. The key is to develop an initial digital backpack that provides for targeted learning but maintains sufficient flexibility and scalability to be useful for multiple teachers and students.

For example, in our media-driven digital backpack for the Freedom Center, we first considered the content outcomes and the process objectives students would need to achieve these outcomes. Like any instructional plan, the design was balanced with the time and space constraints we had to work within, including the school day, transportation time, and the physical space of the Freedom Center. Once we defined these instructional guideposts, we planned the instruction, including a storyline and the tools and media the students would need to gain content information and technology support. This planning resulted in the use of digital videos, podcasts, and various digital and paper project documents. To meet student needs at various levels, this information had to be engaging, accessible, and flexible. Finally, we planned a project workflow that scaffolded student work and project completion. As with any instructional plan, you can make adjustments during the project to ensure completion of desired outcomes.

The digital backpack provides a powerful, flexible, and teacher-friendly design for engaging learners of different ages, interests, and abilities. It supports learning across content areas and incorporates a meaningful experience to develop, refine, and assess students' digital age skills. Mission accomplished!

Resources

FUSION Center: www.cech.uc.edu/fusion
National Center for Universal Design for Learning: www.udlcenter.org
National Underground Railroad Freedom Center: www.freedomcenter.org
NETS•S: iste.org/standards/nets-for-students.aspx
Pasco's Sparkvue: www.pasco.com/sparkvue

James D. Basham, PhD, is an assistant professor in special education at the University of Kansas in Lawrence, Kansas, USA. His research focuses on innovative solutions and strategies for engaging all learners, the use of technology, and Universal Design for Learning.

Ernest Perry is the architect of the Digital Learning Environment at the National Underground Railroad Freedom Center in Cincinnati, Ohio, USA, where the digital backpack was developed and launched. His work focuses on social enterprise, education reform, and informal learning.

Helen Meyer is the director of the FUSION Center, a STEM education and outreach center at the University of Cincinnati, Ohio, USA. She is also the project director for the Woodrow Wilson Ohio teaching fellows program. Her teaching includes masters- and doctoral-level courses in teaching and learning.

Make Science Real

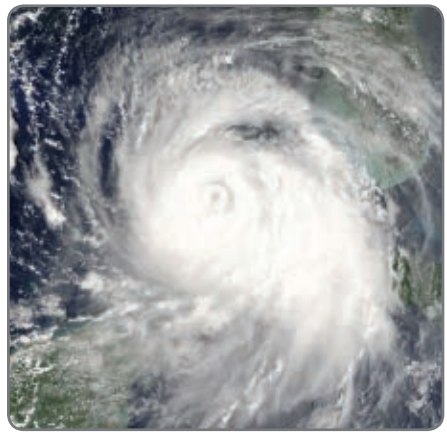
By Jared Mader and Ben Smith

A challenge that science educators face is the need to create meaningful and relevant connections between their content and the scientific community. The task is neither new nor any more important than it was decades ago. In the past, teachers organized field trips, showed videos, invited class speakers, or assigned journal and magazine readings. While these approaches can be engaging, they take a great deal of planning and significant fiscal resources.

The very technologies that connect scientists to each other are the same tools that classrooms can use to meet scientists in their "natural habitats"—the lab, the field, or wherever their careers may take them.

While rich in their own right, these virtual interactions will be even more powerful if you give students the opportunity to see how experts in the field apply what the students have been learning or doing in the classroom. It may be just the incentive your budding scientists need to pursue a career in one of the many fields you expose them to.

NASA's Digital Learning Network. Engaging with scientists from the National Aeronautics and Space Administration (NASA) is now at your fingertips through these free and interactive webcasts and videoconferences that allow students of all ages to work hand in hand with NASA's experts and educational specialists. Educators can find a list of upcoming events related to astronomy, physics, algebra, and more on the website. Each event provides teachers with downloadable educator guides and tips on what students need to have on the day of the event.



The JASON Project. If your classroom adventures lead you into a world of nature exploration, then this project may be the right fit. You and your students can engage with hurricane or tornado researchers live from the U.S. National Oceanic and Atmospheric Administration (NOAA). Working side by side with leading experts from NASA, NOAA, the U.S. Department of Energy, and the National Geographic Society, educators can use the JASON curriculum to teach about weather, ecology, and energy.

The New York Hall of Science. Students can explore selected exhibits, demonstrations, and activities live from the hands-on science and technology center. Connecting students with the actual "explainers" from the museum allows them to see scientific principles happen. Teachers can get supporting materials and instructions on the site.

Science

The Mote Marine Laboratory. Perhaps aquatics and studies in marine biology have seemed out of reach for classroom connections, especially if you're hours away from the nearest coastal region. The Mote Marine Laboratory offers countless resources in the fields of aquaculture, ecotoxicology, ocean life, fisheries, and more. Although many of the web resources lack interaction with a live biologist, Mote does provide outreach programs for schools. One such program is SeaTrek, which features real scientists working in the field and live from the shark tank. Designed for students in all grade levels, the companion curricula covers sharks, sea turtles, reefs, sea life rescues, careers, and more.

Center of Science and Industry (COSI). Videoconferencing allows educators to bring the scientific world into their classrooms. By connecting students to scientists, doctors, and experts in the field, COSI allows students to see the real-life work of scientists. For example, students can have front-row seats during a live knee replacement operation. If anatomy is your specialty, how about allowing your students to watch an actual autopsy, narrated by an expert in forensic pathology? COSI brings the professionals in science, math, engineering, and more to your classroom to discuss cutting-edge research and procedures.

Gemini Observatory. Using videoconferencing, experts report live from the observatory control room, sharing the process of scientific inquiry, human endeavors in science, global challenges, and the nature of scientific knowledge. Teachers can also visit the site to request a CD-ROM that allows students to observe procedures and activities that use real data.

Resources

Center of Science and Industry: www.cosi.org/educators/videoconferencing
Gemini Observatory: www.gemini.edu
JASON project: www.jason.org
Mote Marine Laboratory: www.mote.org
NASA's Digital Learning Network: http://dln.nasa.gov/dln
The New York Hall of Science: www.nysci.org/learn/education/virtualvisits

The very technologies that connect scientists to each other are the same tools that classrooms can use to meet scientists in their natural "habitat"—the lab, the field, or wherever their careers may take them.

—Jared Mader is the director of technology at Red Lion Area Senior High School in Red Lion, Pennsylvania, USA. He has been a chemistry teacher for more than 10 years.

—Ben Smith is a physics teacher and science department chair for Red Lion Area School District. Smith also serves on the ISTE Board of Directors.

Fostering Information Literacy

For a school librarian, particularly in the first couple of years, it can be a struggle to maintain a sound program that meets the needs of the students, faculty, and administration. One challenge in particular that has made my life difficult is clunky and inaccessible web design software.

Although I battled daily to keep student resources and library information current, I also had to painstakingly push my way through the restrictive updating process to make the most of what I had: pages of simple web links to "important websites" and PDF uploaded document pathfinders. As far as my faculty and students were concerned, it met their needs and expectations. But as a professional, I felt trapped. I needed a comprehensive site that trained my students not only to find information, but also to discern the quality and allow them to effectively synthesize that information. In the age of social media and web 2.0, there had to be a way to create a "virtual learning community" rather than an inward-looking, static website.

LibGuides to the Rescue

The content management and publishing system LibGuides came into my life when I needed it most. LibGuides is most often used as a vehicle to present a wide array of library resources and research support in the form of subject and course guides, and it allows for the integration of multimedia content. But I use LibGuides as a tool for library website design and information literacy support. It has proven to be accessible, user friendly, and effective for learning and teaching.

Whenever faculty members request my help, I design a LibGuide tailored specifically for their projects. These guides offer a project overview, including the assignment and rubrics, useful books in the library, featured databases and websites, as well as notes and mini-lessons on plagiarism, note taking, and MLA citation. LibGuide has improved student access to and comfort levels with project-specific resources, and it provides a sound foundation for building assessments.

The LibGuide alleviated the chaos that normally accompanies any classroom project. It allows both the teacher and the students to maintain organization throughout the research process and provides support through the completion of the final product. The project LibGuide simplifies what is often an overwhelming process and is as useful for the classroom teacher as it is for the students.

By Jennifer Thomas

Content Management with Netvibes

Recently I collaborated with Spanish teacher Abigail Theberge on a project to design a Netvibes site. Netvibes is a free web tool that manages content and allows users to create personalized spaces, similar to Pageflakes or iGoogle. Each student was assigned a region in Spain and was required to research that region using the library resources listed on the LibGuide page.

I taught several lessons on information literacy skills before the students embarked on their research. They used the project LibGuide I created to reinforce and support the information literacy skills they learned, which enabled effective research for the creation of their Netvibes site. The unit, called Una Vista de España (A View of Spain), was the first example

of this type of collaboration at Bishop Stang High School and illustrated how information literacy, technology, and academics can merge to enhance students' digital age skills.

Rave Reviews from Students

At the end of the project, I surveyed students about the process. The results revealed that students enjoyed the project and, in particular, appreciated the project LibGuide.

One student commented, "The research databases were helpful because they were all organized into one area. They were easily accessible, instead of having to search for information all over."

Another remarked, "I liked how everything that we needed to complete the project was in one central place. The project assignment, the rubrics, all the resources, etc., were a click away."

That's exactly what I wanted to hear. Theberge shared similar sentiments: "Not only was the project LibGuide an important tool for my students, but for me, as their classroom teacher, it facilitated a smooth process, especially regarding the assessment of the final products."

An annual subscription to LibGuides is $549 and, in my opinion, is worth every penny. It's easy to use, comes with incredible technical support, and is used by more than 1,420 colleges and universities. If I can expose my students to information literacy skills using a tool they may see at college, they are going to be that much more prepared for higher education.

Acknowledgment

The author would like to thank Lori Cooney, project coordinator and instructional design specialist at the University of Massachusetts, Boston, for introducing her to Netvibes as an effective technology tool in the classroom.

Resources

Bishop Stang High School library website: http://bishopstang.libguides.com/home

Bishop Stang High School student projects page: http://bishopstang.libguides.com student_projects

Una Vista de Espana LibGuide: http://bishopstang.libguides.com/content.php?pid=43360&sid=319853

—Jennifer Thomas is the library media specialist at Bishop Stang High School in North Dartmouth, Massachusetts, USA. Her library website won the Web Seal of Excellence Award from the Massachusetts School Library Association.

Students Teaching Students

No longer are mechanics fixing cars. Now they're fixing computers programmed within cars. Students will need similar skills in future classrooms to be productive in tomorrow's world. This is already taking place in one such classroom. At Morehead City Middle School in North Carolina, 80 sixth grade students participated in a community literacy project to promote digital age learning. Students created 3D animation stories and games to teach basic reading and math skills to primary school students. This innovative project used a free program called Alice, created by late professor Randy Pausch, author of *The Last Lecture*. Students learned college-level programming skills through 3D interactive graphical storytelling software.

Goals

The objective of this project was to get students to have fun while learning something difficult. Students learned the basics of writing computer code, and then they taught younger students basic math and reading skills.

A second goal was communication through the use of technology. Students posted their projects on the internet for the world to see.

Implementation

The middle school students learned coding in the Alice programming language, 3D animation, and virtual environment basics over an eight-week period during daily science instruction. They mastered computer code using software tutorials from the internet supplemented by teacher guidance.

Story and game creation took place during the last four weeks of the course. Students chose to create an animation or game based on math or reading that would help younger kids learn a concept. Then the students created a video teaching young students about numbers or letters. For example, one video taught the letters A–F with animated characters, such as an astronaut, a blimp, and a cat, that move across the screen in fun ways.

Students chose to create an animation or game based on math or reading that would help younger kids learn a concept. Then the students created a video teaching young students about numbers or letters.

After the students completed their videos, they presented their projects to a classroom outside their school. They also posted their projects on YouTube and a school blog site so young students could view the videos on demand.

Benefits

The student-created lessons were a big hit. One primary school teacher remarked, "Our students did not want to stop watching the videos and playing the games. Several weeks after the middle school students left, they continued to ask if they could watch and play and have the older students come back again."

One of the benefits of the project was the interaction between the older students and younger students. It was a natural fit. Older students were patient, instructive, and excited to help out the young students. The elementary students enjoyed listening to the older students' instructions and felt comfortable having them come down to their level.

No longer are students completely dependent on teachers for content that is relevant to their lives. This project helps middle school students learn the technical skills to create content and the personal skills to make it relevant to others, particularly young learners. It also teaches students how to find educational content on their own. Eventually, they will be able to create content, just as their older peers have.

With technology growing at an exponential rate, students will need to be able to create original content that they can post on the internet. This project not only gives students technology skills, it gives them a link to the community around them.

Authentic Assessment

Traditional classrooms are set up so that one person collects and grades student work according to a number of criteria. Today, a larger community will judge students on their work, because the internet allows an endless number of viewers to offer feedback and suggestions. Although the students were graded on the completion of their projects, they were intrinsically motivated to complete top-quality work because they knew that anyone with internet access would be able to see it.

The digital natives that inhabit today's classrooms are looking for new and innovative ways to showcase their

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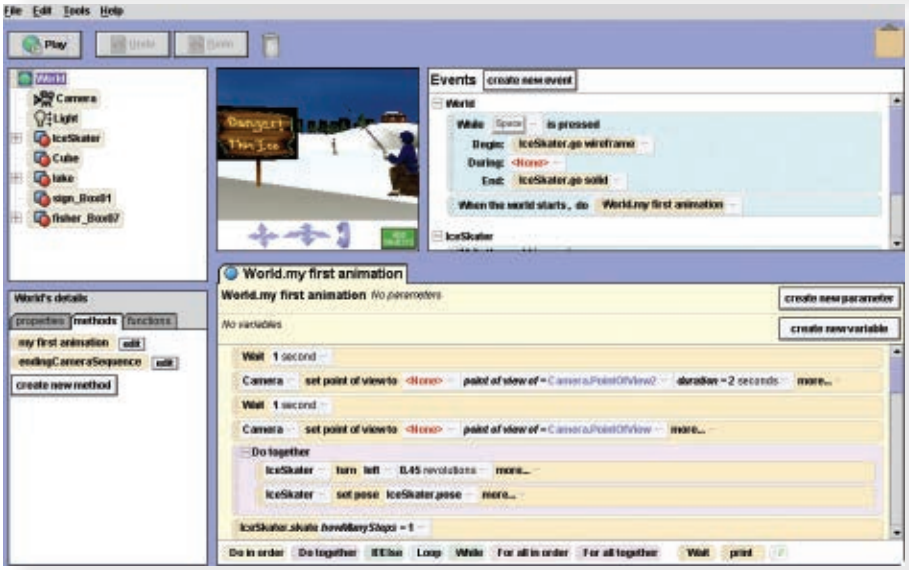
By T. J. Wolfe



talents. This project allowed students to be creative in making their own 3D animation games or stories. Students also used science, language arts, math, and social studies content in the presentation of their projects. They were able to avoid anxiety about their own learning and instead focus on how they could create a game to help younger students understand basic reading and math.

Just as basketball players have solid fundamentals that allow them to become great athletes, middle school students are better able to understand the fundamentals of reading and math so that they can continue to become great students and teachers themselves. As the saying goes, there's no better way to learn something than to teach it. This project's goal was to follow Randy Pausch's motto of teaching something difficult while having fun. Although the Alice program was intended for college and high school use, these middle school students went far above expectations to create projects that will be remembered for years to come.

—T. J. Wolfe is a PhD student and technology coach at North Carolina State University. He taught at Morehead City Middle School in Morehead City, North Carolina, USA, where he was voted Teacher of the Year. Visit www.thecatchsystem.com for more information.

Students Dig Up Dirt to Learn about Internet Safety

Students are dangerously unaware of the privacy implications of social networks.

Many of my students, for example, are stunned when I give them the facts: 87% of Americans can be positively identified from their ZIP codes, dates of birth, and genders. Add residence type and marital status, and you easily surpass a 90% likelihood of identifying someone.

Yet students routinely post this information and much more to the web via a variety of social media applications.

When I voice concerns about internet safety to students, their teenage sense of invincibility keeps them from truly comprehending the impact of an inappropriate entry on a personal blog, social network, or Twitter account. The idea that such actions could adversely affect them when applying for jobs, running for elected office, or even trying to get a date in college seems difficult for them to imagine. To make the learning stick, I knew I needed to connect this lesson to a real-life situation. The question in my mind was: "How?"

When I voice concerns about internet safety to students, their teenage sense of invincibility keeps them from truly comprehending the impact of an inappropriate entry on a personal blog, social network, or Twitter account.

Privacy vs. Security

I developed a module for my Intro to Computer Technology class that seems to do the job well. The point of the lesson is to teach students how to appropriately share information when using social media. First, we review lesson vocabulary and watch a 40-minute documentary called *No Place To Hide* narrated by the late news broadcaster Peter Jennings. The video details privacy issues balanced against collective security. I use the film to introduce the concepts of privacy and anonymity and discuss students' views on them.

Then the real fun starts. We discuss the idea that online data can be pieced together to create a fairly complete picture of an individual. This is legal and practiced routinely by companies marketing their products and services.

Data Mining the Teacher

Next we data mine. I begin by introducing my students to a list of useful search tools for personal information that I have bookmarked on Delicious. We talk about how a data miner can use each tool to find different things and why those are important. I give students 10 minutes to data mine me. They call out possible facts as they find them, and I write them down on the interactive whiteboard, which allows me to perform conceptual grouping later in the exercise. While writing, I do not give any indication of whether the information is true or false.

Then, we examine the information on the board and discuss it. Can they draw conclusions about me? How could they conduct more accurate searches? I give students another 10 minutes to find out more about me. Afterward, I select two pieces of data, one true and one false, and we go through the process of figuring out how the students could determine the validity of each.

This part of the lesson is also very amusing. One class thought I had three wives, and many of my students are convinced I went to high school in a state I have never visited. One other thing I like about this assignment is that I get to learn exactly what data is available about me. This year, a speeding ticket from 2001 popped up!

Vetting the Facts

I understand that this lesson freaks out some adults. But every piece of information the students find is legally in the public sector. It is actually quite safe and very engaging. After all, what

By Jesse Morehouse

The idea that such actions could adversely affect them when applying for jobs, running for elected office, or even trying to get a date in college seems difficult for them to imagine.

student doesn't want to dig up the dirt on his or her teacher? After you show them how to vet the facts, they begin to look at every piece of data skeptically.

For this lesson to work, you need to give students the name of a willing adult who has some degree of web presence. I have had a few other teachers volunteer to be data mined, but searches turned up little more than the names of relatives, addresses, and phone numbers due to their limited digital footprints.

Data Mining a Stranger

The next part of the lesson is to allow students to test drive what they've learned about privacy and personal data-search tools. This task allows students to apply their own analysis and evaluation skills and learn firsthand the limits of internet privacy. Their assignment, executed in teams of two over two class periods, looks like this:

Browse social networking sites or personal blogs and find a "subject" who meets the following requirements:

- Provides first and last name
- Provides current city and state of residence
- Has a discernible gender
- Provides at least "ballpark" age (adults between the ages of 28 and 40 are best)
- Is not from our town
- Is a complete stranger
- Is an ordinary person

Create an electronic presentation with the following slides:

- Cover (with person's photo and first name only)
- Basic information from their social network site or blog (what you started with and why you thought it was important)
- What you found from your search results—with sources!
- Conclusion (four deductions/inferences about your person and two issues/concerns with online privacy)

When they finish their data mining, the student teams present their projects to the class. It is amazing to see what students can find out in just a few hours. Relatives, addresses, pictures of houses, housing prices, estimated income (using a few different estimation methods), dates of birth (usually given away by blog entries of their friends), and much more allow students to create fairly robust profiles of their subjects. Of course, some subjects turn out to be difficult to data mine, but there are lessons from them as well, and students must explain them in their work.

Student reactions to this assignment are commonly a mix of fascination, worries about their own online choices, and at times a feeling of "creepiness" when they discover they are much easier to learn about online than they ever imagined.

The final step in this lesson is for us all to walk through the privacy settings on students' Facebook accounts to evaluate their importance and choose appropriate settings. At this point, they all make changes.

I get more parent compliments on this assignment than on any other. Parents are understandably interested in ensuring their children learn safe online behavior but have little training and experience in exactly how to do that. Many of them even ask for a copy of the recommended privacy settings for their own use.

This assignment makes the topic very real for students, and many of them go on to use these skills in many creative ways, such as helping their parents track down hard-to-find clients!

This lesson is an excellent way to teach higher-order cognitive skills using technology as a medium. And it illustrates that if you are a good digital citizen and make good choices about what you share online, you have nothing to fear. Your online "image" will reflect positively on you.

Resources

Datamining list: www.delicious.com/jessethecsguy/datamining

No Place to Hide documentary: www.snagfilms.com/films/title/peter_jennings_reporting_no_place_to_hide

—Jesse Morehouse teaches computer science at Pagosa Springs High School in Colorado, USA. He loves seeing students apply what they learn. Data mine him using his professional user ID, techkilljoy.

Tip

QR Codes Help Students Navigate the Internet

Problem: My younger students have difficulty navigating to a particular site or page within a site.

Here's a solution: I made QR-code cards (about half-page size) and wrote a description of the site under the image. Students could use the webcam on their computers to scan the QR code to open a specific webpage. I first worked with third grade students to research Earth Day and then write a diamante poem. Each student got four cards. They held the cards up to the webcam to open webpages. Students had immediate access to three sites that addressed Earth Day in slightly different ways (history, facts, activities). Students then wrote and printed diamante poems by accessing a site using the website from the fourth card.

Aaron Atwood-Blaine has been the lower school technology coordinator at the Barstow School in Kansas City, Missouri, USA, since 2003. He uses tablets to teach technology skills to K–5 students and helps classroom teachers integrate technology into their curricula. Atwood-Blaine has a bachelor's degree in computer science and a master's in teaching.

Scan this QR code to submit your own classroom technology tips on *L&L*'s group page on the ISTE Community Ning. Or you can post it on the discussion forum titled "Classroom Technology Tips for *L&L*" on the *L&L* group page of the ISTE Community Ning (www.iste-community.org/group/landl) or email it to dfingal@iste.org.

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RESEARCH WINDOWS

What Does the Research Say?

Clare Strawn

Clare Strawn, PhD, is a senior research associate with ISTE's Research and Evaluation Department (iste.org/research). You can contact her at cstrawn@iste.org.

What does research say about the impact of technology on learning outcomes? It's a question that ISTE's Research and Evaluation Department fields often, but it's difficult to answer. Unfortunately, you can't separate technology as a component of learning and teaching from the many other contexts that influence learning outcomes, such as how it is used pedagogically in the classroom.

Think about how we usually measure learning outcomes: with standardized test scores. Then think about everything that influences how well each student performs on the test, from the home environment to individual psychosocial factors (including learning abilities), teacher preparation and skill, and classroom environment. In the big picture, how much difference do we expect the use of technology to make?

Fortunately, thousands of authors of basic research studies and program evaluations have investigated the impact of many implementations of technology on learning in many contexts. To answer the question of how any one influence affects learning outcomes, researchers enter measures of what they expect will be important, including an intervention such as technology use, into a statistical model. By interpreting the results, the researcher can estimate to what degree any item influences the outcome relative to the other items in the model. The influence of technology use would have to be big to outweigh all of the other contextual and individual factors.

Studies can also report results as an effect size (the difference between the mean for the treatment group and the mean for the control group, divided by the pooled standard deviation) that compares and standardizes the average scores of the two comparison groups. A meta-analysis can derive a composite effect size across many studies to estimate the overall impact of technology on learning outcomes in the big picture.

Tech Makes a Big Difference in K–12

According to R. M. Tamin's article "What 40 Years of Research Says about the Impact of Technology on Learning: A Second-Order Meta-Analysis and Validation Study," published earlier this year in the *Review of Educational Research*, the use of technology in instruction shows small to moderate gains in student learning over instruction that does not use technology. Technology used to support instruction had slightly stronger effects than applications that deliver direct instruction.

The study—which includes K–12 and postsecondary levels, different subject matters, and many kinds of technological interventions but excludes 100% online learning—supports findings from one of the contributing meta-analyses that "computer technology used as 'support for cognition' were significantly greater than those related to computer use for 'presentation of content.'" For example, students learn more from teachers who use technology as tools for learning than when they learn directly from an educational website, CD, or educational software program.

The other important distinction is that technology integration in K–12 schools had a larger effect than it did in postsecondary contexts. Research does not explain most of the difference in student scores, but on average, a student exposed to technology in K–12 instruction will perform 12 percentile points higher than a student without technology-enhanced instruction.

Now that the big question of effect of technology on learning has been answered, this report concludes that research can now focus on the best ways to integrate the many technology tools into learning and teaching practices.

Online Learning Works Best with a Teacher's Guidance

Barbara Means, Yukie Toyama, Robert Murphy, Marianne Bakia, and Karla Jones tackle the impact question from an online learning angle in "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies," which the U.S. Department of Education's Center for Technology in Learning published in 2010. Interactive, collaborative, and multimedia features are relatively new to online learning environments, so the authors could find only nine studies that apply to K–12 education (between 2006 and 2008), and only five of these were sufficient to report effect sizes, despite that "over a million K–12 students took online courses in 2007–08" (Means et al. referring to Picciano & Seaman, 2009). In addition to the five K–12 studies, the meta-analysis included 43 studies of postsecondary learners.

The article addresses the relative effectiveness of online learning compared with face-to-face instruction and with blended instruction and found that:

- Online learners performed slightly better than face-to-face learners. However, instruction delivered only online is neither better nor worse than face-to-face instruction. Authors attribute the small advantage to the greater flexibility, and therefore more time, students apply to learning.
- Blended instruction, which combines face-to-face with web delivery, shows a larger effect size than web-only delivery when compared to face-to-face-only instruction. This larger gain may justify the greater expense of blended instruction compared with self-directed online learning.
- Collaborative or instructor-directed instruction showed a larger effect size than independent online learning.

The authors stress the limitations of this meta-analysis, including the fact that the sample of students in these studies is too small to demonstrate confidence in how the findings apply to younger learners. In fact, effect sizes for the subsample of K–12 learners did not show any advantage for web delivery, and we can't assume that what is effective for adult students necessarily applies to children as well.

Another important consideration for interpreting these findings is that "treatment conditions," such as time on task and pedagogic approaches, cannot be separated from the method of instructional delivery (face to face, online, or hybrid). The authors assert that it is the *combination* of web delivery with curriculum, time, and pedagogy that explains the differences in outcomes.

In their review of studies (which was not included in the meta-analysis for technical reasons), the authors conclude that videos and quizzes do not improve learning delivered online. However, giving individual online learners the opportunity to control online activity and to reflect and self-monitor their learning increases gains.

Implications for Practice

These two studies are important to teachers, administrators, and program planners because they make the case for integrating technology into instruction. Both studies show that technology improves student outcomes the most when teachers integrate technology tools into the learning and teaching experience. They also support the idea that substituting technology for quality teaching is not as effective. Recent and continuing changes in technology, such as social media and interactivity, probably increase the web's effectiveness for learning, but there is not enough research yet on these developments.

If you are implementing a technology program, including well-designed evaluation research will enable you to make specific claims about the outcomes of your investment for your stakeholders and contribute to the growing knowledge of the field. When you're thinking about how these findings might apply to your environment, one place to start is the NETS Essential Conditions, which provides guidelines to set the stage for success.

Resources

NETS Essential Conditions: iste.org/NETS/EssentialConditions

"Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies" by Barbara Means, Yukie Toyama, Robert Murphy, Marianne Bakia, and Karla Jones (2010), U.S. Department of Education, Center for Technology in Learning: http://tinyurl.com/yz2pk56

"What 40 Years of Research Says about the Impact of Technology on Learning: A Second-Order Meta-Analysis and Validation Study" by R. M. Tamin (2011), *Review of Educational Research, Vol. 81*, pages 4–28.

Research Windows Is Changing!

Starting with this issue, ISTE's Research & Evaluation (R&E) Department will author the Research Windows column. In the September/October and March/April issues of *L&L*, R&E staff will summarize some of the most important and up-to-date ed tech studies and explain how the results apply to your education practice. In the December/January and June/July issues, R&E's alter ego, Dr. Eval, will answer questions about how to meet the evaluation requirements of federal- and corporate-funded grant projects in the new advice column "Ask Dr. Eval."

BUYER'S guide

The days of waiting to develop a roll of film have given way to instant viewing, simple editing, and the ability to share photos easily. Today's youngest students may never load a cartridge of film, but they will grow up using powerful cameras to easily capture and share the images of their lives.

Many features previously found on cameras costing more than $500 are now available on units that are affordable for classrooms. This roundup compares digital cameras that produce high-quality images and offer a powerful selection of features for less than $200.

When you buy a digital camera, you should consider five key elements: cost, resolution, zoom, editing, and sharing.

Cost

Many affordable cameras now offer image stabilization, red-eye correction, and video capture. However, larger LCD viewing panels and greater image resolution will increase the price. There are also other costs associated with digital photography to factor into your budget. For example, printing high-quality photographs will require a color printer, specialized photo paper, and color ink cartridges.

Resolution

Digital images are comprised of small dots called pixels. A camera's resolution is determined by the number of pixels lined up horizontally and vertically behind its lens. By multiplying the number of vertical and horizontal pixels and rounding the number off to the nearest million, you get the approximate number of megapixels (MP) a camera can collect in a single shot. For example, 2048 pixels wide by 1536 pixels high equals 3,145,278 pixels, or 3.1 MP. A 6 MP camera will provide enough resolution for most printing needs. More will allow you to print up to poster-size images with clarity.

Zoom

Digital cameras often have an optical zoom and a digital zoom. A zoom's magnification capabilities are specified by a number and a multiplier—for example, 5X. The bigger the number, the greater the magnification.

The type of zoom you use affects the quality of the image. An optical zoom physically extends to magnify your subject. This provides a higher-resolution image. A digital zoom, which uses a magnification process called interpolation, crops your image and enlarges it. This actually reduces image quality.

Editing

Intuitive menus, in-camera viewing, and image manipulation features make editing photographs within a camera possible. Free software is available for additional editing options, such as cropping, adjusting brightness, and saving files in multiple formats. For more sophisticated editing—using layers, clone stamps, and special effects—consider budgeting for a dedicated image editor, such as Adobe Photoshop Elements or Pinnacle Studio Express. Both of these sell for less than $100. (See *L&L* Buyer's Guide, May 2011, pages 40–41).

Sharing

Digital cameras typically come with a USB cable and memory card slot for easy transfer of image files to a computer.

While students can easily email large image files or post them online, a computer screen is limited in the number of pixels it can display, so more megapixels do not usually offer an advantage when it comes to online sharing. Also, smartphones with relatively low image resolution may take acceptable pictures, and many have internet connectivity.

—Maureen Yoder, EdD, is on the faculty of Lesley University's Technology in Education Program.

Digital Cameras

Company	Model	Price	Resolution	Optical Zoom	Digital Zoom	LCD	Notes
Canon www.canon.com	PowerShot ELPH 100 HS	$179	12.1 MP	4X	4X	2.7" 6.9 cm	Backside-illuminated CMOS sensors to improve low-light performance
FujiFilm www.fujifilm.com	FinePix AX300	$100	14 MP	5X	6.7X	2.7" 6.9 cm	Powered by two AA batteries, 720p HD video capability
Kodak www.kodak.com	EasyShare Sport C123	$80	12 MP	Fixed focus	5X	2.4" 6.1 cm	Dust proof, sand proof, and waterproof up to 10 feet
Nikon www.nikon.com	S6100	$200	16 MP	7X	4X	3.0" 7.6 cm	720p HD video capability, in-camera red-eye removal
Panasonic www.panasonic.com	Lumix DMC-FH25	$200	16.1 MP	8X	4X	2.7" 6.9 cm	Intelligent Auto (iAUTO) adjusts setting to scene
Samsung www.samsung.com	SH 100 Wi-Fi	$200	14 MP	5X	5X	3.0" 7.6 cm	Wireless sharing of photos and video
Sony www.sony.com	Cyber-shot DSC-WX9	$190	16.2 MP	5X	6.3X	3.0" 7.6 cm	Dual recording technology takes stills and video at the same time, backside-illuminated CMOS sensor

PRODUCT reviews

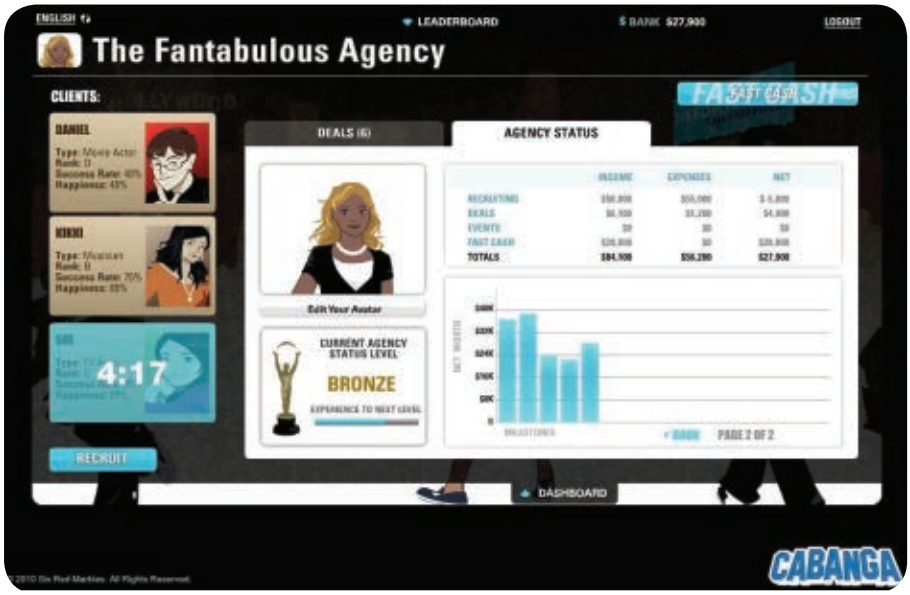
Cabanga

By Margaret L. Niess

Cabanga, developed by Six Red Marbles, is an online role-playing game that gives middle school mathematics students multiple dynamic elements to manipulate. This interactive video game challenges students to run an entertainment and sports management agency. The goal is to become a successful manager of talent clients, called "celebs." Students must first recruit talent and then make deals to provide work for their celebs while also attempting to elevate the agency's status level from bronze through silver and gold to platinum.

Students begin by personalizing their talent agency, determining a name for the company, and even designing their own avatar. A $50,000 startup account provides sufficient funds to recruit talent. The agency has the capacity to manage up to three celebs at a time. However, the student must make deals that will increase the celeb's happiness and increase the agency's bank account. When they determine a possible deal for a particular celeb, students activate a spinner (based on probabilities displayed for the deal and the talent) to determine if a match is made. When it is, the celeb begins working for a specified time.

If the agency's bank account needs funds, students can choose to earn "fast cash" by taking on different mathematical tasks. They earn additional funds by solving problems from one of these possible topics: numbers and number link; decimals, fractions and percents; order of operations; patterns; ratio, proportions, inequalities, and expressions; equations; data and probability; and coordinate planes. Students select a topic and answer questions from that topic. In fast-cash mode, time stops so that students have as much time as they need to respond to the questions. After selecting a category, such as numbers and number line, the student selects from whole number, decimals, fractions, or integers. From the whole-number category, a problem appears with a dollar amount tied to a correct response.



In this example of Cabanga's dashboard view, the Fantabulous Agency has made a deal for Sue, and she has about four minutes to complete the job. Opportunities for deals become available for a limited period, requiring students to make decisions in a timely manner.

Fast cash relies on an adaptive curriculum to quickly figure out the ideal difficulty level for the student. If the student is getting all the problems correct, the difficulty level increases.

Cabanga includes a teacher dashboard to review student accounts, see what topics students are working with, and check their progress against the National Council of Teachers of Mathematics (NCTM) standards, the Common Core State Standards, and standards for each of the U.S. states. A leader board displays the level, bank accounts, and success each agency has in making deals. Teachers can use this feature to establish competitions among students, classes, or even schools.

As I played the game, the challenge of making decisions required complex thinking skills. I was motivated to make good deals for my celebs and quickly recognized the importance of reading and making sense of all the information about the celebs and potential deals. A couple of times, I did not

catch that the deal was for a male and I matched it with a female. Obviously, the spinner revealed "no match."

I worked with Tonya Mauk, a middle school mathematics teacher at City View Charter School in Hillsboro, Oregon, to use the program with a variety of student abilities in sixth, seventh, and eighth grade math classes for a period of six months. She and I found that Cabanga shares the common positive effects of games on school achievement, cognitive abilities, motivation, attention, and concentration.

Sixth grade students from the school said they liked creating their own avatars, acting as agents, and using pie charts and other visuals. Finding good deals, making matches, and completing the math were some of the tasks students found most difficult. Some of their suggestions for improvement included greater levels of difficulty and more levels, though many liked the game as is.

Six Red Marbles intends this game to be supplemental to instruction. Mauk found that Cabanga was a great way to engage students who showed proficiency in the topic, and this gave her time to work with smaller groups of struggling students.

She said she liked the teacher dashboard because it gave her a general view of what concepts to spend more time on, and the individual reports allowed her to target the needs of each student.

She noticed that students enjoyed the leader board because it fostered a sense of competition. However, once students reached the platinum level, there is not much else to do except compete for the leader board.

Teachers who would like to measure student success with state, Common Core, and/or NCTM standards should assign students to work on fast-cash areas. Mauk noted that students can be successful in the game without much fast cash, so they need additional incentives to use that option.

Cabanga's role-playing challenge is highly engaging. It requires a teacher's interaction and guidance, yet students are in control of their own agencies. They are challenged to make business decisions that involve probabilities, yet the experience is enjoyable. Cabanga is a sound educational video game that helps students learn math while having fun.

Cabanga
www.sixredmarbles.com/cabanga
$10 monthly subscription
$100 one-year subscription (educational pricing available for 120 students or more)

Margaret "Maggie" L. Niess is professor emeritus of mathematics education at Oregon State University in Corvallis, Oregon, USA. Her teaching and research has focused on development of teacher knowledge for teaching with technologies in mathematics and science.

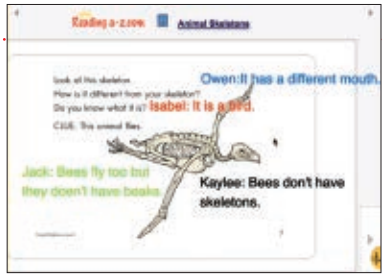
WHAT'S new

PCI Education has launched **Momentum Math Grade Level Editions**, a flexible and targeted mathematics intervention program for students in grades 6–8. The program is designed to engage kids who have fallen behind in math, including students with special needs and English language learners. Through a series of lessons, Momentum Math helps students master the concepts, procedures, and language that are the foundation for higher mathematics, including algebra. Intended for students two or more years below grade level in math, Momentum Math builds conceptual understanding, procedural fluency, and problem solving through lessons that follow research-based, scaffolded pedagogy. Once students understand a topic and achieve fluency in the related procedure, lessons help students see the relevance of the math they have learned and provide an opportunity for assessment of key concepts and skills.

MORE INFO: www.pcieducation.com/momentummath

The Center for Autism and Related Disorders (CARD) has launched **CARD eLearning and Skills**, a 40-hour online training course to equip users with knowledge in applied behavior analysis. Designed to assist with effective intervention for children with autism and related disorders, the course provides assessment tools, including developmental milestones, activity guides, and lessons with supplemental materials to ensure application to each child's real life. Users can use the web-based programs to design and implement individualized and comprehensive treatment program plans.

MORE INFO: http://centerforautism.com/Services/CARD_SKILLS.asp



Splashtop Inc. has released an app that allows teachers and students to turn their iPads into interactive whiteboards. **Splashtop Whiteboard** connects to a classroom computer over Wi-Fi, allowing students to watch Flash media with fully synchronized video and audio, control their favorite applications, and annotate lesson content from an iPad.

MORE INFO: www.splashtop.com

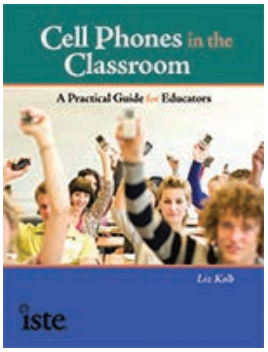
PLATO Learning has added **AP U.S. History and AP Chemistry** to its online course offerings. Aligned with College Board standards, both courses feature an interactive platform designed to engage students and facilitate a collaborative learning environment. Courses are semester-long, available as a comprehensive library or on a subscription basis, and customizable for either independent or group learning.

MORE INFO: www.plato.com

DreamBox Learning has released the **DreamBox Learning Administrator Dashboard**, a new reporting tool that enables school and district administrators to monitor the participation, proficiency, and progress of all students in a school using the DreamBox Learning math software. The dashboard allows school and district leaders to track, segment, and customize four essential types of information, including student use and progress in the curriculum; concept proficiency viewed by grade level, classroom, or change-over time; class usage during user-specified timeframes; and school and classroom license use.

MORE INFO: www.dreambox.com/administrator-dashboard

L&L senior editor Diana Fingal compiled this information from press releases sent to the *L&L* editorial office. The *L&L* staff does not review the products and resources, and they are offered here without recommendation. Send press releases to products@iste.org.



ISTE will release ***Cell Phones in the Classroom: A Practical Guide for Educators*** in September. Author Liz Kolb shares case studies that illustrate practical ways to use cell phones for classroom projects, homework, and communication with parents. The book includes sample lesson plans, tutorials for mobile-supported web 2.0 tools, strategies for involving students without cell phones, and planning and preparation tips. The book costs $24.47 for members and $34.95 for nonmembers.

MORE INFO: iste.org/store

Hub International has released its new iPad case, which is compatible with the iPad 2. The **HandStand2** brings Apple fans a rotational accessory that allows users to effortlessly spin the device 360 degrees for quick transition from landscape to portrait viewing and back again. Users can use the iPad 2 while turning it for optimal viewing and easy manipulation of the touchscreen without accidentally launching apps or randomly scrolling. An integrated iPad stand with a slight incline allows for typing when placed on a stable surface.

MORE INFO: www.thehandstand.com

EduPlanet has launched an **open source social learning platform** designed to transform traditional professional development for K–12 educators. EduPlanet features institutes that blend digital age social networking technologies with online content to create a cohort-based design that enhances peer learning. Expert authors and facilitators guide and mentor participants. Educators engage in a social learning environment for review, shared practices, and reflection to offer ongoing support for problem solving.

MORE INFO: www.eduplanet21.com

Casio America Inc. has released a new family of **lamp-free eco-friendly data projectors**. Equipped with Casio's Laser and LED Hybrid Light Source, the 12 new projectors are capable of achieving high-brightness projection output up to 3,500 lumens. Three new categories of projectors—Signature, Pro, and Short-Throw—offer 3D capability, intelligent brightness control, and interactive whiteboard and pointing. The projectors provide a 3D graphic experience, and each model incorporates a full input/output interface, including three types of video and audio inputs, as well as HDMI, RGB, and RS-232 terminals.

MORE INFO: www.casio.com/products

COMING NEXT ISSUE

What Does It Mean to Read a Book?
Students are trading paperbacks and textbooks for smartphones, e-book readers, and iPads. Annette Lamb, a professor at Indiana University, writes about how mobile devices, multimedia publishing, and social technologies are transforming the reading experience inside and outside the classroom.

Solving a Puzzling Math Question
Should we focus math instruction on computational fluency or real-world problem solving? Math consultant Matt Kuhn argues that technology can accomplish both by allowing scaffolded computational fluency through repetition and practice while engaging learners in meaningful problem solving.

Build Your Own Assistive Tech Toolkit
A plethora of assistive technology tools abound in Mac and PC operating systems, and many others are available free online. Kelly Ahrens, a district technology director in Rhode Island, outlines a method for building a toolkit and offers advice on how to work with the school IT department.

Should Students Use Their Own Devices in the Classroom?

Debate this and other controversial issues at iste-community.org/group/LandL.

AS I SEE "IT"

Most Don't Realize Just How Sophisticated School Networks Are

By Susan Poling

Susan Poling is the technology coordinator for Shelby County Schools in Alabama, which serves 28,000 students. She has 20 years' experience as a district-level technology coordinator and has served as an officer for the Alabama Education Technology Association, an ISTE affiliate.

Recently I accompanied my husband to his professional association's annual conference. Unlike ISTE, this group's entire membership and a handful of spouses can all fit into one private dining room for the annual group dinner. Here, cocktails and seafood are consumed over a buzz of intricate industrial discussions and debate that quickly become indecipherable white noise to me. But each year, about halfway through the meal, my reverie is interrupted by one gallant engineer who is willing to sacrifice a few moments of shop talk to engage me in a brief and innocuous conversation. I have always believed that one member at each table has been assigned this task—those unlucky few who drew short straws during the cocktail hour.

Anticipating the typical sightseeing or shopping query, I had come prepared with a snippet or two that would quickly free my questioner to return to the engineering debate surrounding us. I was shocked when the man to my left turned and said, "You're an IT director for a school system, right? You must worry a lot about kids changing their grades." That's when it hit me—school system IT directors must be considered the Rodney Dangerfields of the IT world.

It amazes me that some people still think the threat of students hacking the system to change grades is as gnarly as it gets for us. Even IT applicants seem shocked when they realize that their former employer's two-server network, with 200 workstations that serve 250 users, is small fry compared to that of even a small school system. It is a mystery how people can walk through schools with hundreds of computers, interactive whiteboards, and even distance-learning equipment and use the many online resources that schools have to offer, and still come out thinking that IT systems in school districts are somehow "elementary."

I know that far more sophisticated networks exist, but I think few can rival those of a school district for the diversity of hardware, software, and especially users.

Is grade changing my biggest concern? No. I am more concerned about protecting the data of thousands of students from internal and external threats. I worry when I read that hackers have been using spam and Facebook to research and then contact a school system's accounting personnel to obtain their passwords and loot the district's bank accounts of millions. I worry that I can't afford the redundancy that we really need to keep us operational in the event of a tornado turning our way instead of toward my fellow school districts. And I worry about how to avoid disappointing and underserving our students' technology needs due to a lack of funding.

I know that far more sophisticated networks exist, but I think few can rival those of a school district for the diversity of hardware, software, and especially users. Even when the public sees it, they just don't see it the way we do. So, all you Rodneys out there, the polite thing to say is, "Yes, sometimes I worry about a student changing grades, but we get it cleared up pretty quickly." Which, much to my husband's relief, is exactly what I said before moving on to the cheesecake.

Claudia Uribe de Piedrahita

Spreading Ed Tech to Spanish-Speaking Educators

Claudia Uribe de Piedrahita didn't initially pursue a career in educational technology, or even education for that matter. She studied physical and occupational therapy in college and then worked in real estate. Later she managed nongovernmental organizations (NGOs) in health services and for underprivileged children in her native Colombia.

It was the death of her son, Gabriel, in 1995 that set her on a trajectory of improving information and communication technology (ICT) for K–12 schools serving underprivileged students.

Gabriel was killed in an airplane crash at the age of 22. He was just six months away from graduating with honors from Harvard University in applied math. His immediate dream was to teach at a school in a disadvantaged community.

"Gabriel saw education as the key to creating a more equitable world, and he considered communication, the spread of knowledge, and the shared experiences and realities of human beings to be pillars on the path toward tolerance and peace," Uribe de Piedrahita said.

To honor the memory of their son, she and her husband, Francisco Piedrahita, established the Gabriel Piedrahita Foundation. The NGO is dedicated to improving the quality of primary and secondary education in Latin America through the effective use of ICT, focusing on less-privileged schools and communities. Uribe de Piedrahita is director of the foundation, which started out working in a handful of schools in Cali, Colombia, and then expanded to larger programs. The foundation designs, implements,

and tests curricula, lesson plans, and other tools aimed at increasing the competency of students and teachers in ICT and improving technology integration into all subjects.

"We have seen changes, sometimes dramatic changes, in the attitudes of teachers and students toward teaching and learning, in the level of aspirations of the kids, in their attainments," Uribe de Piedrahita said. "Many students are attending college, something they would not even have considered before."

In 2001, recognizing the lack of Spanish-language resources for teachers, the foundation launched Eduteka (www.eduteka.org), a site packed with information about and resources for integrating technology into the classroom. Eduteka offers free original and third-party content—including updated national and international articles, interviews, and research studies—as well as resources and interactive spaces.

When it began, Eduteka served mostly Colombian teachers. But as word spread, it began attracting registered users from Spanish-speaking countries in North and South America and Europe. These days the site's visitors are not just teachers but school administrators, teacher trainers, and preservice teachers. Eduteka averages 517,056 visitors a month and more than a million page views.

The foundation was a natural fit for ISTE, and Uribe de Piedrahita became a member in 2000.

"ISTE has been a compass for the foundation and for Eduteka throughout these years," Uribe de Piedrahita said. "We cannot think of what our foundation and its ability to fulfill its mission would have been without all we have learned from ISTE."

Uribe de Piedrahita serves as an ISTE Ambassador (iste.org/ambassador), which means she helps educators in her region connect to one another and find resources. She also volunteered to translate the NETS into Spanish.

Uribe de Piedrahita works tirelessly to connect Spanish-speaking educators to modern tools, but she knows there are many more pieces to the puzzle than merely offering support and education.

"We need much more hardware, and we need much better connectivity," she said. "But, above all, we have to transform our school administrators and our teachers. We have to give them the training opportunities and allow them enough time to appropriate and feel comfortable with the new demands of 21st century teaching and learning."

—Diana Fingal is senior editor of L&L.

Technology, Coaching, and Community

Jayne James, co-author of ISTE's Technology, Coaching, and Community white paper and former senior director of Education Leadership, talks about the NETS for technology coaches and introduces ISTE's new online coaching center.

Not a day passes without technology touching our lives and work. Although relationships remain the core of who we are and how we connect, many are unable to make those connections without the assistance of technology. How many of us drive back to the house if we've forgotten our phones? The thought of missing texts and calls or being unable to find key resources on our smartphones is unthinkable!

Students feel that affinity as well. When teachers do not effectively integrate technology into the educational process, students are not fully engaged and miss out on authentic learning experiences emphasizing collaboration, creativity, and innovation. This may leave them unprepared to be productive digital-age citizens and participants in the highly competitive, global, digital workplace.

Many schools are working hard to provide digital age learning environments to students to meet this challenge, and we know that the NETS for students, teachers, and administrators are helping to guide their implementation efforts. Professional development is pivotal to this success, yet what type of PD are we providing? Do we take a digital age approach, or do we continue to provide stand-and-deliver workshops without supported opportunities for follow-through?

ISTE recently convened a small group of distinguished leaders to share the success they were having with PD models that integrate context, collaboration, and technology. When analyzing their success, three essential concepts emerged. The most effective PD was:

- Technology rich
- Delivered via a coaching model
- Enhanced by the power of community and social learning

ISTE believes the convergence of technology, coaching, and community (social learning) is essential to model learning and teaching effectively in a connected, global society.

Where do you begin to develop a transformational learning ecosystem? ISTE offers 10 tips for building a PD model inclusive of technology, coaching, and community in a recent white paper focused on the synergistic and powerful partnership between these elements. These concepts can help you meet with stakeholders within your building or school district and see how your current offerings or PD models compare.

Just as leveraging technology can help improve learning and assessment, it also can help shift to a model of connected teaching. All types of coaches benefit when weaving technology into content and practice. In an effort to support coaching-related efforts worldwide, ISTE has introduced a new member to the NETS family: the NETS for Technology Coaches (NETS•C). These standards can enrich professional practice and offer clear support when working with teachers in the areas of visionary leadership; teaching, learning, and assessment; digital-age learning environments; professional learning and program evaluation; and digital citizenship.

ISTE is also launching an online coaching center—a free professional learning community—within ISTE Learning (istelearning.org). Although the center lives virtually, it promotes a people-centric (versus platform-centric) approach. There is no cost to participate. Just fill out a quick registration form to create a free ISTE Learner account. ISTE supports coaching professionals by providing relevant content, expertise, and measures for success. ISTE invites you to join them to get your transformation under way!

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iste.org/jdlte
Formerly the *Journal of Computing in Teacher Education.*

Journal of Research on Technology in Education
iste.org/jrte

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