What does successful response to intervention (RTI) look like when all the pieces come together?

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FEATURES

Rural Districts Bolster Choices with Online Learning
Don Brown
Learn how four small rural school districts in Oregon use online learning to offer enrichment courses to advanced students and give struggling students a way to retake courses to graduate.

How to Do More with Less
Lessons from Online Learning
Liz Pape, Tracy Sheehan, and Colleen Worrell
Take a page from the online learning playbook to save time and money in your classroom while increasing student engagement and digital age competencies.

Fostering Creativity and Innovation through Technology
Sheena Vaidyanathan
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Distance education used to refer to correspondence courses (or, in my case, to how far away I sat from the teacher). Some sources cite a 1728 newspaper ad for a shorthand course as the first distance learning opportunity. The Open University concept hit in the 1960s, and now technology has bent the time–space continuum even further, allowing for ever newer ways of learning, such as Second Life, Khan Academy, and Full Sail University. Schools use distance education to address scheduling conflicts, help students gain access to hard-to-staff courses, provide credit recovery, offer dual enrollment with colleges, and supplement the face-to-face classroom. This has created alternative learning opportunities for millions. In a November 2011 report from the National Center on Education Statistics, 1.8 million K–12 students in U.S. public schools were enrolled in online courses in 2009–10.

Online learning, our target topic this issue, has exploded despite many persistent myths: Online degree programs are a scam, the courses are easier than those in brick-and-mortar settings, credits earned online won’t transfer, distance learning is for kids who can’t hack it in “real” schools, and so on.

In his article, “Rural Districts Bolster Choices with Online Learning” (see page 12), Don Brown, an instructional technologist, dispels some of those myths. He describes how his rural education service district in Oregon was able to offer enrichment courses as well as give struggling students ways to graduate.

Though a conversation about distance learning can sometimes sound more like a breakfast order—flipped, blended, hybrid—online learning holds promise for students of all kinds. Of course, as with any educational program, one size does not fit all. Not all students can be successful in a totally online program. Students can get more out of their education if they know a bit about how they learn best. The Connecticut Distance Learning Consortium (CTDLC) offers a quiz to help students determine their readiness for online courses.

To help you help your students get the most from a hybrid approach, Liz Pape, Tracy Sheehan, and Colleen Worrell share ways to save time and money. In their article, “How to Do More with Less” on page 18, they describe several ways to engage students using free and inexpensive tools and employing techniques from blended and flipped classroom environments.

Online learning is likely to become part of everyone’s educational experience as opportunities continue to evolve. How will you leverage this powerful technology for teaching?

Resources
Anytime Anywhere Learning Foundation: http://aalf.org
CTDLC readiness quiz: www.ctdlc.org/Students/Online_Learning/Quiz.cfm?nav=67
Distance Education: www.tandf.co.uk/journals/CDIE
Distance Education and Training Council: www.detc.org
International Association for K–12 Online Learning: www.inacol.org
ISTE’s new online professional development courses: iste.org/store/professional-development/iste-u.aspx
Are Teachers Even Necessary?

On my daughter Janie’s last day of kindergarten, I snapped a photo of her teacher, Miss Susan, giving Janie a big hug. The shot is a little blurry and not well composed because I wasn’t expecting this spontaneous show of affection. But the warmth in Susan’s eyes and the connection between the two make this picture one I will always cherish. To me, it says more than any test score or teacher assessment about Susan’s ability to teach.

I also know that this kid came out of the womb raring to learn. My husband and I have encouraged her curiosity, fed her passions, and read to her nearly every day of her life.

That isn’t the case for every kid. Some kids love school, others hate it. Some teachers connect with every student, others can’t. Two recent blog posts from educators examine the value of teachers from distinctly different perspectives.

Taken together, they illustrate why it’s not easy to diagnose or remedy what has sadly been termed “school failure.”

Pernille Ripp, a fourth grade teacher who writes Blogging through the Fourth Dimension, laments the notion that technology can replace teachers. In her post “Teachers Do More Than Teach—Why Technology Can Never Replace Them” (http://tinyurl.com/7gx8m2d), Ripp writes:

Computerized tests may be better at accurately assessing which reading skills my student needs to focus on, but a computerized test will not know why that student has not mastered that skill. It can dictate a learning program to fix that gap or to propel them forward, but hitting rewind and watching it over and over will not always guarantee that a student masters a concept. So when we let videos be the only teaching tool for a child, or a computer program, then we stop figuring out why that child is not understanding. We lose that human connection that teachers provide.

Her post prompted this response from John T. Spencer:

It’s easy to be fooled by Khan artists, tricking us into thinking that the human element isn’t important. It’s easy to slip into “school didn’t work for me” must mean “school won’t work for anyone.” In both cases, it’s an obsession with binary thinking. What makes us human is our paradox, our frailty, our nuance, our creative impulses that are completely unprogrammed. Kids need that.

On the blog The Innovative Educator, Lisa Nielsen takes a different tack. In her post “You Can Never Replace the Teacher. Or Can You? 9 Ways to Learn without Teachers” (http://tinyurl.com/7xr8smj), Nielsen contends that she absorbed nothing meaningful whatsoever from her years at school, despite graduating early with honors. In fact, she says, school sapped her passion for learning:

The reality for me is that I would have been much better off without the teachers in my life weighing me down and wasting my time.

Nielsen, who is the technology and innovation manager at the New York City Department of Education, goes on to share ways that students can learn without teachers, most of which involve technology. She suggests holograms, books, blogs, videos, podcasts, online curricula, and virtual worlds. She provides links to sites that guide student learning, such as e-Learning for Kids, M.I.T OpenCourseWare, Open Learning Initiative, and many others. She concludes:

As hard as it might be for some to acknowledge, when it comes to learning, teachers are not for everyone. If we are not afraid to accept this as a fact, how might we change the learning environments we provide for 21st century students?

One commenter, Jo Tracey, attempted to answer that:

Imagine sharing knowledge and resources with no lesson plans, letting the kids take off on a tangent of interest. Imagine seeing the light of curiosity and enthusiasm in the eyes of a group of 17 year olds (or any other age). Yes, learning enthusiastically! It is possible. I have witnessed it.

Diana Fingal is the senior editor for L&L. She has been writing for and editing periodicals for more than 25 years.
Multitasking: Boon or Bane?

Boon

Though cliché, the old adage about the chicken and the egg is all too fitting for this discussion. Did our reliance on modern technology grow from a human desire to multitask? Or did our propensity to multitask develop and expand because we have so many tools to jump to and from?

On any given day, I could be writing a report for work, answering an email, getting a text, assisting a coworker via instant messaging, and cleaning up some web code, all while listening to music. As I type this, I have open two internet browsers with a multitude of tabs (work homepage, work email, Google Apps administration, personal email, a teacher webpage template I am creating, Google music, and my graduate studies Blackboard page), in addition to Microsoft Word and three Excel files.

I cannot sit and work on a task uninterrupted until completion—not because I don’t want to, but because my environment and culture

Bane

It may seem that multitasking is a natural part of daily human function. It’s true that, for instance, your eyes may be viewing this narrative while your ears hear what is happening around you. Your hands and fingers might be navigating this page as you read through the text. Your brain is able to discriminate what is important from the extraneous inputs your senses are receiving. It can instantly shift focus, delegating tasks to the background and back again. Even the process of writing this essay was an example of multitasking: my fingers typing, my brain thinking about what is to come, my ears filtering noises from other offices and students in the hallways. But is this really what most people mean when they refer to multitasking?

I believe that when most people think of multitasking today, they are thinking more about what technology is capable of doing. Since the late 1980s, computer operating systems have had the capability to run simultaneous processes. Since then, we’ve transferred this idea to our own brains,
won’t allow it. While I would love to be able sit and work on one thing from start to finish, I can’t just ignore all my phone calls, emails, and other requests. We are all expected to be constantly accessible and connected, so we have no choice but to multitask. Because of the sheer amount of tools and content available to our students, they face a similar overload, now and in the future, and knowing how to multitask is a vitally important part of being able to handle it all.

To efficiently multitask, we need to be able to critically identify the most important task for that instant, taking into account both work and personal factors, and work on that task until something more important arises, even if that important something is switching to another task while your current task develops in your head. Crucial to multitasking is developing the analytic and critical thinking needed to be able to, in a split second, identify if you should continue working on that current task or switch to something new. The only way to gain these skills is through practice—something that teenagers are getting in spades. By developing the ability to quickly jump between tasks, students are honing the very skills they need to successfully navigate an inundation of information.

It is easy for even a seasoned professional to get buried under work and data, so it’s important to build the skills to be able to filter it effectively. Granted, a big problem is that many teens’ priorities are not the same as many adults. They are still learning how to easily switch between tasks to something that is more important, but sometimes talking to a friend is the most important task to them. As technological leaders and role models, it is up to us to help students identify and hone their critical-thinking skills so that they can effectively use their time and be successful later in life.

—A former K–8 technology instructor, Chris Stefanski is currently the associate director of technology for the Paterson Diocesan Schools in New Jersey, USA. He assists both principals and teachers in helping the schools meet their educational technology needs.

and now we have the same expectations for ourselves. Rather than prioritizing and focusing on a particular task while other minor tasks operate in the background, we now believe we should be able to keep multiple processes running equally and at the same time.

Massachusetts Institute of Technology neuroscientist Earl Miller was quoted in a 2008 National Public Radio article (www.npr.org/tablet/#story/?storyId=95256794) stating, “For the most part, humans can’t focus on more than one thing at a time,” unlike computers, which can run multiple processes with all of the needed “focus” on each one. He says that, instead, we “shift our focus from one thing to another with astonishing speed.”

The crux of Miller’s explanation is its emphasis on focus. While a computer can blindly process multiple tasks, it is incapable of being distracted. It isn’t listening to its environment. It can’t smell something cooking in the kitchen. It doesn’t see pictures on a television. Human beings, on the other hand, are constantly taking in and processing information. We are the consummate input device. We can’t shut off our senses. We are able to make determinations about what is important and what is extraneous noise, but that takes mental energy too. That’s why we get distracted and why we sometimes lack focus.

Educational psychology courses teach us that classical music, vanilla, and a view of the outdoors are all beneficial to learning. Yet if the music is too loud, the smell is too strong, or the sun is too bright, these inputs can quickly become distracters. If this is true, it’s no stretch to imagine the impact that incoming text messages, a yammering television, and an iPod blaring music may have on focus.

By developing the ability to quickly jump between tasks, students are honing the very skills they need to successfully navigate an inundation of information.

To contribute to this and future discussions, visit www.iste-community.org/groups/LandL.

Humans can’t focus on more than one thing at a time, unlike computers, which can run multiple processes with all of the needed “focus” on each one.

To do something well, we must be able to focus on that task and delegate other inputs to appropriate, lesser levels of awareness. The more complex the task, the more focus required. Driving a car is a great example. Extensive research shows the influence of drinking (which impairs focus), texting, and other distractions on one’s ability to drive. Just transfer that analogy to learning. There’s no way students can do it to their highest potential if their attention is elsewhere.

—Dennis McElroy is an associate professor of education and director of technology for the Graceland University Gleazer School of Education in Lamoni, Iowa, USA. He formerly worked as a high school science teacher, administrator, and technology consultant for the Iowa Department of Education.
READERS respond

POLL RESULTS

Multitasking: Boon or Bane?
Respondents who believe the brain is incapable of multitasking engaged in a spirited debate with those who see it as a vital digital age skill.

Evolve or Perish
The impact of the digital world on digital natives is still unknown, as the human species has never gone through such an explosion of information. Overload is unavoidable, so the offspring of this new world have to acquire the skills necessary to deal with it. Maybe in the process, the human brain (which is “massively plastic”) will adapt to the new environment, reorganize itself, and become capable of multitasking.

Saadia Oulamine
Instructional Technology Specialist Candidate
Philadelphia, Pennsylvania, USA

To Each His Own
It depends on personality. I base this on my own homegrown scientific experiment: my two kids. One does his homework while YouTubing, watching TV, and texting; the other does it in silence with headphones on. Their interests and career trajectories will likely be quite different, but their grades are the same.

Nancy Segal
Director of Government Relations
Educational Testing Service
Washington, D.C., USA

Not Whether But When
The question is not whether multitasking is good or bad, but rather if we know when it is productive and when a more focused approach is needed. Students aren’t widgets but are all different. Tasks are also different and require different [levels of] focus. The real skill we need to teach our students (and many of our colleagues) is when to multitask and when not to.

Dodie Ainslie
Coordinator of Instruction
Endicott, New York, USA

At What Cost?
As a digital immigrant, although I am not “media multitasking,” I am able to prepare dinner, help children with their homework, schedule a doctor appointment, and make sure that my dog isn’t making a mess on my sofa. As a teacher, I know it’s critical to be able to navigate our multimedia world. More kids are spending more time using more media simultaneously than ever before. The question is, at what cost? How much are they learning?

Aggeliki Nikolau
Architect/Secondary School Teacher
Rhodes, Greece

Let Go of Your Fear
We need to teach our students how to process and absorb information with other stimuli going on. By the time these students are adults, who knows what jobs or tech tools will be available to them. People need to let go of their fears of this shift in the next generation.

Rayna Freedman
Fourth Grade Teacher
Educational Technology Specialist
Mansfield, Massachusetts, USA

Skill for an Imperfect World
Focusing on one thing is the best way to complete a task. [But] very few people are able to work on a single item from start to finish without having to worry about distractions or other deadlines. My students have seven classes a day. I would have to ask how easy it is to focus on a single item when seven need to be completed, in some cases with overlapping concepts.

Dennis Dill
Educator
Lakeland, Florida, USA

Efficiency vs. Stupidity
There is a difference between stupid multitasking and efficient multitasking. Our news media constantly focuses on the dire effects of “stupid” multitasking, such as driving a car while texting. We have to put all this media into focus. Millions of people multitask everyday in a responsible and professional manner. The business world thrives on multitasking and rewards its workers with jobs and raises based on their multitasking efficiency.

Elaine Giugliano
Associate Professor
Rutherford, New Jersey, USA

Multitasking Fails
If you believe in the cognitive load theory, you know it is impossible to do [multiple] tasks simultaneously, and there’s a high likelihood of diminished performance in the quality of work. Here are some scenarios that emphasize my point: Have a student spell his name out loud while typing a Shakespearean sonnet, or send a 140-character text while explaining the steps to find his favorite song on an iPod.

Kenneth Shelton
Technology Teacher
Los Angeles, California, USA

Boon 46%
Bane 54%
Don’t Forget to Vote!

Voting in the ISTE Board Elections begins March 13 and will wrap up on April 13. Openings for two-year terms beginning in June include:

- Affiliate representative
- At-large representative
- Corporate member representative
- PK–12 schools representative
- School district administration representative
- Special interest group representative
- Teacher education representative

Visit iste.org/elections on March 13 for a list of candidates and cast your ballot for the members of the ISTE Board of Directors who will represent you.

School Reform Expert to Keynote at ISTE’s New Leadership Conference

ISTE will hold its first-ever leadership conference October 21–23 at the JW Marriott in Indianapolis, Indiana, USA.

Focus Forward: Visionary Leadership for Digital Age Education (www.isteleadershipconference.org) is the theme of the ISTE 2012 leadership conference designed for superintendents and education administrators.

This professional development opportunity will feature discussions about national and international curriculum trends and education policy and will explore best practices and research-based solutions for the challenges that education leaders face.

Content will center on ISTE’s NETS for Administrators, essential conditions, digital age teaching and learning, and technology skills.

Michael Fullan, professor emeritus of the Ontario Institute for Studies in Education at the University of Toronto, Canada, will be the keynote speaker. Fullan is dedicated to education reform and improving learning and teaching by engaging with policymakers and local leaders around the world.

ISTE Leads Study Tour Down Under

ISTE is leading its first study tour to Australia September 28–October 13. International educators from all sectors, grade levels, and areas of expertise will visit Australia, a nation known for its forward-thinking ideas and education transformation.

Participants will tour schools and national education organizations in Perth, Melbourne, and Sydney. They’ll also attend the Australian Computers in Education Conference in Perth (http://acec2012.acce.edu.au). Up to 40 ISTE members will be making the trip. For more information, visit iste.org/studytour2012.
The programs that ISTE’s Research and Evaluation (R&E) Department evaluates often focus on the effective use of educational technology in K–12 science, technology, engineering, and mathematics (STEM) classrooms. We use all the usual methods for gathering data—surveys, interviews, document review, statistical analyses, and the like—but classroom observations hold a special place in our hearts. While people report all sorts of useful things on surveys and in interviews, we have found that it is something else entirely to see learning in action.

Contrary to popular misconceptions, observations are not stern judgments that evaluators confer upon classroom practitioners. They are more about constructive feedback. We work with a number of projects funded by grants from the National Science Foundation and U.S. Department of Education, and in that work, we do our best to help project staff and teachers understand what parts of their programs are working well and how to improve those that aren’t.

Sure, compared with online surveys, observations are expensive. But well-designed observations are worth the time and money, especially when we want to know about how teaching changes over time.

What makes a well-built observation? Here’s what the research tells us.

Get Agreement
Sometimes, we all know what something is and what it is called. For instance, if part of an observation plan is to assess instructional groupings, it’s probably not difficult to distinguish among individual, small-group, and whole-class activities. But what if we’re interested in assessing the presence of project-based learning or authentic instruction? Each of these concepts must come with a set of indicators or aspects of the concept that we can observe. Agreeing on these indicators is sometimes difficult. We must establish construct validity, which means that a community (of researchers, evaluators, teachers, etc.) agrees that the indicators adequately represent the concept of interest. One way to do this is through collaboration among key stakeholders, where the group iteratively refines the concepts through discussion and research. But remember that in education, a variety of people must be able to understand what you’re talking about. So it’s imperative that the concepts are accessible and “valid” for others outside of your expert circle.

Once we agree on what we’re talking about, we have to check in to see if observers are all seeing things pretty much the same way. This might seem unnecessarily picky, but reliability among observers (inter-rater reliability) is also important. Even when indicators are clearly laid out, observers might disagree about what they’re seeing. One person may see students identifying trends and forecasting possibilities in a history class, for instance, while another argues that they are simply memorizing events without conceptualizing the chain of events as a “trend.” Constructs that have multiple and/or complex indicators lend themselves to a lack of inter-rater reliability.
Anthony D. Pellegrini's 2004 book, *Observing Children in Their Natural Worlds: A Methodological Primer*, offers some clear chapters about these topics. A couple of chapters from Harry T. Reis and Charles M. Judd's *Handbook of Research Methods in Social and Personality Psychology* (2000) are also good resources, especially Oliver P. John and Veronica Benet-Martinez's chapter "Measurement: Reliability, Construct Validation, and Scale Construction" and Roger Bakeman's chapter "Behavioral Observation and Coding." These sources are full of good research-based, technical advice, but if you want just one common-sense tip, consider this: If observers are having a hard time agreeing about what they're watching (problems with reliability), there is probably a lack of clarity around the construct and, thus, a problem with validity.

**Collect the Right Data**

Construct validity is important, but observers also have to focus on the specific constructs they want to assess. In any classroom, an (arguably) infinite number of things can happen. To which does an observer attend? At least for program evaluators like myself, the answer is simply those things that the project is concerned with.

Because observers have to, at some point, analyze the data they collect, it also pays to collect it in some kind of systematic way. Paul Croll's *Systematic Classroom Observation* (1986) is a traditional primer on the advantages of systematic observation, wherein observers look for specific activities (or the absence of them) in a natural context, such as a classroom. Systematic observations use predetermined "codes" in observation rubrics. These codes correspond to specific indicators of interest for an observer. Remember that you don't need codes for everything, but only for the behaviors and phenomena that are of interest to you.

Bakeman's work, including his 1997 book *Observing Interaction: An Introduction to Sequential Analysis*, offers readers a more technical look at how to refine codes and how to collect and analyze data. He places special emphasis on the idea of sequential analysis, or how the order of events and intervals between events can tell us important things about what happened in a classroom. So, in addition to the topics or codes that might be important to your project, an observer also must consider the format of the data. Does it matter if the data are void of temporal position? Or is it important to know the order and timing of events?

Systematic observation stands in contrast to ethnographic observation, whereby, instead of establishing a predetermined rubric to guide observation, observers are more concerned with seeing the classroom from the eyes of the teacher or students. Sometimes an observer may be more concerned with the meaning and order the students make on their own; for this, a structured rubric may inhibit one's ability to discover what the classroom has to offer. For most educational programs with clear goals and activities, an observer usually needs something that defines constructs and strategies more "systematically."

**Finding the Right Tool**

So you know your target concepts, you and the members of your observation team agree on how to spot those things in the classroom, and you know what kind of data you need to tell your story. What's next? While you might be inclined to simply "write up" the protocol and take it into the classroom, we would advise that you survey the field of existing instruments and systems first. Even though you might decide that none is right for your team, you might get some good ideas about formats from the existing tools. A quick internet search offers many examples; take a look at the goals, length, and format of the tools to get some ideas for your own. Some systems, such as the eCOVE software, are even compatible with tablet devices.

At ISTE R&E, we use several kinds of observation instruments. We like tablet-based applications because they make data collection and transcription easier, so there is no need to enter "notes" into a computer after a long day of observation. One unique tool under development can record qualities of classroom interactions, including the types of questions that teachers and students ask, resulting in long data files of verbal exchanges.

Given that we usually work with projects that are designed to help teachers integrate educational technology to improve the learning process, the relationships among learning activities and groupings, technologies, and the NETS are often important. The ISTE Classroom Observation Tool (ICOT) serves this purpose rather well, although it does lack construct validity. As many of you know, the NETS are complex and multifaceted, making any particular standard difficult to check off when observing in a classroom. It’s also not always clear exactly what each standard looks like at different schools or for different grades. Take a look at the ICOT ([iste.org/icot](iste.org/icot)) to get a sense of the complexities involved, especially when it comes to the indicators for the NETS for Students.

Then again, if it weren’t a complex problem, perhaps it wouldn’t be worth investigating. Because observational data are used to make decisions about a program or funding, we observers have to do our best to get it right.

**Resources**

eCOVE: [www.ecove.net](http://www.ecove.net)

ICOT: [iste.org/icot](iste.org/icot)

NETS for Students: [iste.org/nets/students](iste.org/nets/students)
By Don Brown
Rural Districts Bolster Choices with Online Learning

Find out how four small rural school districts use online learning to offer enrichment courses to advanced students and give struggling students a way to retake courses to graduate.

All schools can benefit from giving students the option of online learning, but for many rural schools, online learning is a lifeline. In the past two years, Lane Education Service District in Oregon, USA, has developed online resources for 14 Lane County school districts, which vary in size from 170 students to as many as 17,000.

Many of the smaller districts, which offer fewer courses due to the size of their staffs and limited space on the schedule, turn to online learning to give students a richer selection of offerings. Some have found online credit recovery courses to be an excellent tool for helping students graduate on time. And most of our districts use online curricula to customize instruction for students.

Our goal is to remove barriers, develop free and low-cost shared services, and innovate using online tools.

The first phase of our collaboration with the districts was to purchase turnkey courses that provided everything—the learning management system, teachers, and courses. Now in our second phase, we are building courses ourselves and trying them out with local teachers. We also have online enrichment programs for fifth and eighth grade gifted students.

During this project, we have found that each school district has a unique story based on its students, teachers, and community. What follows are examples of ways that four of our rural districts have not just implemented online learning, but tailored it to fit their needs.
By the time we began working with Creswell, the district already had years of experience using online courses from a variety of vendors. The district developed a sound procedure for identifying students for online courses, and the staff had considerable expertise in mentoring them. They established a tiered approach to enrolling students in online courses, with gifted students getting top priority, followed by juniors and seniors who had at least a 3.5 grade point average (GPA) and wanted a course that was not available at their school.

Creswell was so ahead of the curve that we turned to Sue Bowers, the district’s instructional assistant in charge of monitoring online students, to help guide our initial vendor picks and early best practices in mentoring. She began using online courses in 2005 and last year attained a 100% completion rate. She attributes the success to the following district procedures:

- Students may take only courses that are not offered by the school already.
- Students pay 10% of the course cost.
- Students work on their online course (usually just one at a time) during a dedicated period at school with a mentor.

If money is available, students with GPAs as low as 3.0 can take an online course, and in rare cases, sophomores may take them as well.

This year, the district began offering credit recovery. The credit recovery model is a bit different, in that students do not have to pay up front for the courses, and the courses must be required for graduation.

When students work on courses every day, at a set period, they get the support they need for success, said sophomore Rebecca Bowers:

Taking online classes is a really good way to explore who you want to be and what you want to know without having to worry about whether or not your school will have the resources.

Technical, scheduling, and progress-monitoring issues exist, but the most challenging part is helping students stay on track. Sue Bowers said:

The scheduling piece is most difficult for the students. If the course does not generate a pacing chart, be sure to have them build one with due dates for assignments and tests. I review the pacing charts with every student individually each Friday. More students tend to fall behind than work ahead. Without consistent support, students may fall so far behind, they give up.
Lowell School District: 280 Students

Before we began working with the district, Lowell High School had used a less expensive online course product for credit recovery, with mixed results. That’s why, during the first year of the countywide effort, many students felt like the courses were more difficult. But the monitoring we provided, along with better interactivity in the courses, allowed students to be successful.

Using credit recovery, regular courses, and electives, Lowell has integrated online courses for all students.

Student Jaren Nichols sums up the advantage of online learning for him:

My school does not offer a Spanish II class, and I need another year of Spanish to get into a four-year university. Without these online courses, I wouldn't be able to get into college as easily.

Now in the second year of development, Lowell educators are establishing criteria for students who want to participate in the program. Students must have a teacher's recommendation, and juniors and seniors get first priority for credit recovery courses, but younger students can also take them as space allows.

District Superintendent Aaron Brown looks forward to the day when staff teach online content themselves.

Several years ago, Lowell educators experimented with sharing Spanish courses via a statewide interactive video-conference (IVC) service. That program “didn't take off,” Brown said, “probably due to the supervision issues associated with different schedules at different sites.” Unlike IVC, online courses offer more opportunities for students to work and interact with each other asynchronously. Brown said:

Getting more of our teachers using online resources will help us serve students at both ends of the spectrum—enrichment courses that allow capable students to move ahead and other components of online learning that help students who are in the alternative-education model.

In addition to full courses online, Lowell teachers use an online supplementary math program in the computer lab to differentiate curriculum. The math teacher, Liam Pilong, designs the courses, and students complete them at their own pace. Testing is proctored at school. Pilong has found this to be a good way to serve students who need a wider scope of resources than grade-level materials, and it’s less expensive than buying a full suite of supplementary materials.
Next, the staff at Lowell High School is thinking about using a commercial online mathematics curriculum that can be tailored for each student. Some of the teachers on the Lowell staff have embraced online learning and are developing course assets on their own. But building a full course is a long-term process, so teachers are beginning by hosting a collection of websites and reading resources. As they gain more expertise developing a blended model using the Moodle course management system, they discover they have many options for instruction that were not available before.

Pleasant Hill School District: 840 Students

Pleasant Hill School District was already using an online math curriculum before we began working with them. This year, the district is using online courses for students who have been exposed to content already but need to make up the credit and demonstrate more mastery. Online credit recovery courses have had mixed results at Pleasant Hill, and school officials cite “less motivation” as one reason why some students are not as successful.

Pleasant Hill’s credit recovery model involves students attending the online course every day for 50 minutes in a computer lab with a trained mentor.

In addition to credit recovery, some students take courses online for enrichment or because they want to take courses not offered by staff, such as German, Japanese, Mandarin, physics, or computer programming.

Mentor Inga Perham says, “Online courses allow us to provide courses we can’t offer due to a smaller staff, and it allows us to compete with nearby in-town schools.”

Crow-Applegate-Lorane District: 310 Students

Crow High has been using online courses since the school became part of our Online Options program in fall 2010 [see “Right on Course,” Le&L, August 2011, pages 26–29]. In addition to providing courses that would not normally be available, such as world languages, Crow-Applegate-Lorane uses scaffolded courses with a variety of students, including those on individualized education plans (IEPs).

Sean Bradshaw, the primary online mentor for high school students at Crow, acknowledged that it’s easier the second time around. “Students understand how to navigate courses and work with mentors to pay special attention to pacing,” he explained.

Bradshaw has set a baseline expectation of completing 6% of the course each week, and he keeps a close eye on how students are progressing.

Online courses not only provide content knowledge, they also teach kids technology skills and prepare them for the future, Bradshaw said, adding, “We need to train these kids for their world.”

Establishing a collaborative structure to remove barriers was essential to getting the program started. We assumed the financial risks by setting up a dedicated fund to pay for course seats in AP, regular, and credit recovery courses. The number of seats was proportional to the total number of students each district had compared to all students in the county. This allowed districts to try different courses with various student populations without spending their own money.

After the first year, the ESD continues to pay for credit recovery courses, and the districts each have unique models for using the other courses. The ESD kept the credit recovery courses so we could continue to monitor progress, develop best practices, and obtain a bulk purchase discount.

Removing the financial barrier allowed students and staff to try things out and gave them time to develop policies and procedures. Now, at the beginning of the second year, principal Ron Osibov and staff have worked together to
update the old “distance learning” language in the student and teacher handbooks. These are the criteria they consider before enrolling a student in an online class:

• Is online the best setting for this student?
• Will it affect the jobs of teachers in the district?
• What is the cost for this student to take the course?

Online courses are broadening choices for students, providing an effective alternative for students on IEPs, and helping students graduate who certainly would not without the opportunity to make up a course online.

The Path Ahead

We are now developing local course resources, training teachers in Moodle, and offering our own courses. Using Collaborative Statistics, a college-level statistics textbook by Barbara Illowsky and Susan Dean, as a guide, we are developing our first full-year course.

We chose Collaborative Statistics because Oregon students will soon be required to have three years of mathematics at the Algebra I level or higher, and most high schools have a difficult time providing options for students who don’t want to take calculus. We have branched the course from the textbook to use some of the project-based instructional strategies that have proven successful in alternative high school settings. Students can complete the traditional path or go the project-infused route. After piloting this year, we will share the course via Creative Commons.

One way for teachers to create content if they don’t have time to build an entire course is to create miniblocks of web resources. Using bookmarks saved over the past two years in Diigo, we will begin offering minicourse blocks in high-interest topics to encourage others to give blended learning a chance.

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Schools everywhere are facing a difficult conundrum. Parents and the government continue to ask them to educate more children at higher standards with less time and less money. On top of that, students must master a whole new set of skills—digital age skills—if they are to succeed. What’s a school to do?

These strategies and resources can help teachers from any learning environment, including traditional face-to-face classrooms, engage students and teach them digital age skills more efficiently and affordably.

**Make Time**

Two innovative online learning strategies—the blended classroom and the flipped classroom—maximize face-to-face time by enabling increased student-to-student and student-to-teacher interaction as well as more personalized instruction focused on individual learning needs. Both strategies also foster the development of independent learning skills, similar to those gained from online courses, as students learn at their own pace and take responsibility for seeking out free educational resources on the web.

**Blended teaching.** The term blended refers to mixing traditional face-to-face instruction with online learning practices. In blended classrooms, teachers use digital content, resources, and tools to enhance, extend, and transform the learning process. This approach results in the best of both worlds, including...
How to Do More with Less

By Liz Pape, Tracy Sheehan, and Colleen Worrell

Whenever/wherever learning, personalized teaching to meet students’ individual learning needs and styles, and access to open resources and tools that more fully engage students in the learning process. Some examples of effective blended teaching strategies include:

- Classroom teaching resources (class notes, slideshows, or videos) that teachers post online for students to review after class or at home
- Online assessments that students can use as a self-check
- Online collaborative areas where students can continue classroom discussions or group projects after class
- Homework help through synchronous chat

Flipped classroom instruction. What if we changed the definitions of homework and classroom practice by asking students to use their time at home to become familiar with content instead of doing homework, and to use their classroom time to actively engage with other students and their teachers to think critically and apply knowledge to real-world problems, group projects, lab work, or classroom discussions? In a flipped classroom, teachers use technology, such as podcasts or videos, to deliver class lectures or demonstrations. If needed, a student can replay a teacher’s demonstration or lecture several times until she understands all the concepts. And if she still needs more help, she has classroom time the next day to work one on one with the teacher. By turning the traditional homework model on its head, limited classroom time ceases to be a constraint to learning.

Free the Resources!

Both blended and flipped classroom strategies rely on open educational resources—free online tools and materials designed to support instruction. Web tools and resources can generate new and exciting learning experiences for students of all abilities and learning styles, and teachers can use them to develop digital age literacies. The sheer number and easy accessibility of these tools and resources also gives students multiple options for completing projects, thereby differentiating and personalizing both the learning process and their end products. This allows students with different learning styles to process information and comprehend content in the way that is best for them, and approaching content from several angles allows all learners to better integrate it into their knowledge.

Web tools also address many facets of student motivation by empowering them, giving them choices, allowing them to express themselves in their preferred formats, encouraging them to collaborate, and engaging them with interactivity rather than passive consumption.

Finally, web resources give students the opportunity to develop research, internet literacy, authoring, and publishing skills.

Here are a few categories of free tools that develop these skills in an engaging way:

Blogs. When students write about subject-specific content for an authentic audience, they are learning not only about the topic, but also how to effectively communicate with others. Blogs promote critical and analytical thinking when students share knowledge and reflect on content.

In one Virtual High School (VHS) anatomy course, for instance, a blog serves as a culminating activity for the study of human systems and how they all work together to allow the body to function properly. Each student chooses a system and homeostatic mechanism and blogs about why they are important. They read their peers’ blog posts and comment on each other’s examples to explore how they are related.

In the VHS course Genes and Disease, students examine genetics and the law. Students review the legal aspects of genetic testing and the rights to a person’s genetic information. In response, students have blogged about genetic testing as part of the application process for health insurance, employment, and obtaining parental consent for newborn screening.

Wikis. These sites promote collaboration skills and creativity by enabling groups to work together to create and publish a work online. For example, students can co-create an online study guide to prepare for an end-of-course exam. Contributing to a crowdsourced resource, such as Wikipedia, also gives students experience with researching, authoring, and publishing to an authentic audience.

Social bookmarking tools. Sites such as Diigo, Delicious, StumbleUpon, digg, and reddit promote research and information fluency. You can use these free tools to analyze, critique, and evaluate websites, subject-specific resources, or news stories.
When students find good resources, they can use social bookmarking to share their research and analysis with their teachers and peers. Users can form groups to share information, collaborate, and discuss. When students create short descriptions and tags for each item they bookmark, they have to think critically about each site and measure its value. As they accumulate bookmarks, they begin to articulate the comparative value of the different sites against others they encounter.

Diigo, for instance, allows students to highlight content at the bookmarked site and add comments using “sticky notes.” Diigo then provides a unique URL to the annotated version of the article. In addition to comments left by the bookmarker, the reader can comment and ask questions.

Creative expression tools. Students can hone their digital communication and publishing skills while expressing their creativity using a number of free online tools. Here are just a few:

- **Glogster** is a social networking tool that allows students to create interactive posters with text, graphics, music, and videos.
- **VoiceThread** allows students to make collaborative, multimedia slideshows with images, documents, and videos that visitors can comment on by voice, text, audio file, or video.
- **Popplet** combines the features of a virtual bulletin board with mind-mapping, bookmarking, presentation, and collaboration tools. It can incorporate web links, video, or Google maps into a mind map. It is a creative-thinking work space for essay planning or storyboarding and a great environment for group work.
- **Prezi** is a presentation tool that is similar to Powerpoint except that it uses a web-based 3D canvas rather than a sequential slideshow. Students can incorporate not only text and images, but also videos, mind maps, and other digital resources.
- **Photovisi** is a free and easy way to use an online tool to create photo collages. It allows you to choose one of many templates, throw your images together, and gather them into a digital collage.
- **My Fake Wall** is a tool for creating a fake Facebook wall for fictitious or historical characters. How would your students build a wall for Einstein or President Obama?
- **Fotobabble** allows students to upload images from lab experiments or field trips and then talk about them. Have students define vocabulary words and offer images to go along with them, or describe an image of a piece of art.

Examples from Real Classrooms

The Virtual High School Global Consortium has partnered with several school districts that are creating blended teaching models. Here are some examples from recent collaborative efforts that demonstrate strategies, tools, and resources that have received positive response from both students and teachers:

**Digital storytelling.** In Jeanie Keyes-Plante’s seventh grade literacy lab, she asks students from the Westfield (Massachusetts, USA) School District to write a story and create a story-board. Each student then constructs a digital story of the narrative event that incorporates text, graphics, musical accompaniment, and voice narration. Digital storytelling transforms students’ work into visual showcases and is a powerful medium for representing their understanding in a form other than traditional writing.

The students use Photo Story 3 to create their digital stories. They begin by importing images from their computers. The software offers several functions, such as adding effects, adjusting color, customizing motion, or rotating images. They can add text to images and choose fonts, then they use a microphone to add voice narration. Finally, they add music by choosing from the software’s free selection or uploading their own audio files.

**Comic strips.** In Irene Sweigard’s seventh grade language arts classroom at Westfield, students use comic strips to create story lines and poetry and to define language arts terms. They publish their products using ToonDoo, a free online comic strip maker.

Comic generators allow students to visually represent their knowledge and understanding. Because they are so short, they present only the most essential information, so students can focus on and remember key concepts. Comic strips also promote reading in reluctant readers and help teach writing and punctuation.
ToonDoo allows students to select a layout from a menu of templates and upload images or select them from the site’s gallery. They can add text and then publish their comics on the site to share and discuss them with their peers.

Brainstorming. Beth O’Connor’s eighth grade language arts students at Westfield use an online tool called scrumblr to brainstorm the character traits that best represent the main character in a story. They use scrumblr to create a two-column chart that shows the traits and how they affect the story’s conflict and resolution.

Next, using a blank ToonDoo comic strip template, pairs of students draft a new scene or ending to the story that shows how the character’s traits contribute to the conflict and resolution. Each team shares its scenes and identifies the trait students chose and how it contributed to the conflict and resolution. They give each other feedback on the plot and clarity of the scenes and publish them on ToonDoo.

Digital information organization. Kristen Biancuzzo has built a LiveBinder for her Westfield High School sophomore language arts course to help her students complete a mini-research project on the books The Bean Trees by Barbara Kingsolver and A Yellow Raft in Blue Water by Michael Dorris. A LiveBinder is a virtual three-ring binder where a teacher can post information for students to access during and after school for homework, research projects, or studying.

Educators can upload resources to a LiveBinder as PDFs, images, presentations, videos, podcasts, documents, links, and more, which could support both the flipped classroom and blended teaching models.

Students can also use LiveBinders to create products such as digital textbooks. You can give students curriculum standards and instruct them to find websites that fulfill the standards. They can also search for and share websites that engage them and enrich their learning. Such activities encourage self-directed, self-motivated learning experiences; engage students with subject-specific content; and provide an opportunity to practice information and research skills, which means the learning takes place at all levels of Bloom’s Taxonomy.

Social networking. Joanne Hentnick, the technology facilitator for the Westfield School District, supports students in responsible technology use with a tool that is very familiar to them—a social networking site. Edmodo is a private, teacher-moderated social network where students can share ideas, publish their work, and learn how to communicate effectively online. It’s an ideal place to build digital age skills, host a blended learning environment, or post content for a flipped classroom.

In Edmodo, teachers and students can share notes, links, and files. Teachers can send alerts, events, and assignments to students and post any item to a public audience. They can even use the platform to poll or quiz students and host discussions. Students can also turn in assignments on Edmodo.

Edmodo integrates with other web 2.0 tools, and students can share and publish products they have created using ToonDoo or LiveBinders to the class Edmodo site. But the tool’s best feature is the ability to build an online community, where students can ask questions about assignments or have discussions after school and get responses within a few minutes.

Digital games and simulations. Roberta Roffo, a computer teacher at Tilton Elementary School in Haverhill, Massachusetts, quickly saw the value of using open educational resources to teach mathematics. In one lesson, Roffo used the National Library of Virtual Manipulatives site to introduce concepts and devise a series of differentiated lessons to help her second grade students master the mathematical concept of regrouping. She then created student-centered activities using two of her favorite open math game sites for kids, Dositey and IXL. Students loved having the opportunity to work at their own pace and test their knowledge through digital games and simulations. Students who grasped the material more quickly helped coach their peers through the content. Using open educational resources to personalize math instruction was a hit with students and teachers alike, and third grade teachers were soon asking Roffo to adapt her lesson plans for their students.

Virtual learning environments. Karen Bernier, an eighth grade math
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Resources

- Diigo: www.diigo.com
- Dositey: www.dositey.com
- Edmodo: http://edmodo.com
- Khan Academy: www.khanacademy.org
- LiveBinders: http://livebinders.com
- Moodle: http://moodle.org
- National Library of Virtual Manipulatives: http://nlvm.usu.edu
- ToonDoo: www.toondoo.com/cartoon/3340814
- ToonDoo tutorial: http://tinyurl.com/79as5lw
- Prezi: http://prezi.com
- Scrumblr: http://scrumblr.ca
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- Scrumblr screencast: www.youtube.com/watch?v=tLrrGHPnWxQ
- Scrumblr example: http://wps.edmodo.com/public/grade-7-cyberbullying/group_id/287398
- Scrumblr tutorials: http://help.edmodo.com/userguide
- Photovisi: www.photovisi.com
- Photovisi tutorial: http://tinyurl.com/7x2qn5h
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- Photo Story 3 student project example: www.youtube.com/watch?v=lTrGHPlN7WQ
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- Popplet example: http://wps.edmodo.com/public/grade-7-cyberbullying/group_id/287398
- Popplet tutorials: http://help.edmodo.com/userguide
- Prezi: http://prezi.com
- Scrumblr: http://scrumblr.ca
- Scrumblr tutorial: http://tinyurl.com/7x2qn5h
- Scrumblr screencast: www.youtube.com/watch?v=tLrrGHPnWxQ
- Scrumblr example: http://wps.edmodo.com/public/grade-7-cyberbullying/group_id/287398
- Scrumblr tutorials: http://help.edmodo.com/userguide
- Photovisi: www.photovisi.com
- Photovisi tutorial: http://tinyurl.com/7x2qn5h
- Photovisi screencast: www.youtube.com/watch?v=8oMfzn1I72s
- Photo Story 3 student project example: www.youtube.com/watch?v=lTrGHPlN7WQ
- Photo Story 3 tutorial: http://tinyurl.com/7x2qn5h
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- Photostory example: http://wps.edmodo.com/public/grade-7-cyberbullying/group_id/287398
- Photostory tutorials: http://help.edmodo.com/userguide
- VoiceThread: http://voicethread.com
- VoiceThread tutorial: http://tinyurl.com/7x2qn5h
- VoiceThread screencast: www.youtube.com/watch?v=8oMfzn1I72s
- VoiceThread example: http://wps.edmodo.com/public/grade-7-cyberbullying/group_id/287398
- VoiceThread tutorials: http://help.edmodo.com/userguide

Liz Pape is the president and CEO of the Virtual High School Global Consortium, which is based in Maynard, Massachusetts, USA.

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Colleen Worrell is manager of professional development for the Virtual High School Global Consortium.

teacher at Ashland Middle School in Massachusetts, used what she learned through Project ABLE (Achieving Blended Learning Environments) to transform her teaching and her classroom. Bernier was a self-proclaimed “newbie” to blended learning, but the success she had making information, digital resources, and pre-assessments available to her students 24/7 through her school’s Moodle site made her eager to learn more.

When the Project ABLE training introduced her to the flipped classroom, Bernier decided to give it a try. She first relied on the video resources of Khan Academy but slowly integrated her own vodcasts and other free resources as well. She created a whatever/whenever/wherever online learning environment and blended it into her student-centered, project-based face-to-face classroom.

She was amazed at the impact this shift in approach had on her students. They were engaged and excited about learning math, sometimes even bringing parents to their online classroom to show off what they were learning. Bernier saw students who had struggled with math move to a higher level of competency by the year’s end. She is not only giving her students a rigorous mathematics education and raising proficiency rates, she’s also giving them the opportunity to master a host of digital age literacies.

The rationale for using these technology-enhanced lessons is clear. They help students write more effectively when they plan, revise, edit, and rewrite. They develop visual and multimedia literacy. They encourage self-directed, self-motivated learning experiences. They engage students with subject-specific content, and the learning takes place at all levels of Bloom’s Taxonomy. Best of all, students can apply the digital age competencies they gain to all subject areas and grade levels, ultimately preparing them for success in our technology-driven world.
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My experience teaching nearly 1,500 elementary school students in public schools has shown me that one possible answer lies in teaching digital art or digital design (vector graphics, 3D design, and computer programming). During the past two years, the Los Altos School District (LASD) in California, USA, has provided each fourth through sixth grader in its seven elementary schools a 12-week digital design program that focuses on using computers for creativity. Digital design is neither learning technology nor learning with technology, but learning creativity and innovation through technology.

If you walked into one of these classes, you might find a fourth grader editing bitmap images using Seashore or setting RGB values in an open source vector graphic program called Inkscape. This fourth grader will tell you why RGB 255, 0, 0 is red and how she would have to change the alpha value to create a transparent object for a symmetrical pattern. A fifth grader might be designing a model of a futuristic room with multiple levels and underground tunnels using the 3D modeling tool Google SketchUp. A sixth grader might be working on adding an enemy to a video game designed in Scratch, a programming language designed by the Lifelong Kindergarten group at the Massachusetts Institute of Technology.

Many of these concepts may seem a little too advanced for elementary school, but these kids are soaking it in. They are challenged but definitely thriving in the world of digital art. They are also getting an opportunity to express their creativity and understand the STEM material in a real-world setting.

Experimentation Leads to Creativity and Innovation

Art inspires creativity, and in today’s world, the computer is the tool for design and creativity. Digital art is particularly well suited for trying out new ideas, and this easy experimentation allows the freedom to create and innovate.

In my digital art classes, I have seen children visibly relax once they find that the undo button works as expected. They are no longer worried about making mistakes, because they can always correct them or just start over again. Unlike in a traditional art class, there is no cost of adding the wrong paint or making a line that cannot be erased.
The students love the idea that they have unlimited “paper” and the opportunity to make not just one project but many versions of the same project. Because some students are eager to conform or afraid to fail if they try something different, they start tentatively making a project similar to the one demonstrated in class. With some encouragement, they make another version, and they try to push the limits and make something a little different. While everyone starts to make a bear that looks like the one I make in the demonstration, they quickly shout out their own unique interpretation: “Mine is going to be rainbow colors,” “Mine will wear a top hat,” or “Mine is a Cyclops.” Like every famous artist, they are experimenting and trying new ways of representing the same subject so that they can express their uniqueness. Even under more controlled situations, such as the video game project where their programming skills are limited, students find ways to be different. They can show their creativity in the story idea, the choice of characters, and the game rules, and they can change these during each class and experiment to make the game their own. The students know this is ultimately an art class and that they can relax and try anything.

Many of my students love to copy a completed project and modify it. Without any encouragement, my fourth grade students create a clone or a “twin” of their character illustration and then tweak its parameters. My fifth grade students turn their finished 3D model of a house into a neighborhood with buildings of similar yet different styles. These students are using
Digital Design Reinforces STEM
Digital design is a blend of art and technology. It is built on a foundation of mathematics, science, and engineering. For example, vector graphics is the manipulation of lines and shapes that are defined by mathematical equations. A student editing nodes in a line in Inkscape is experiencing in a very tangible sense the abstract concept that lines change as points are moved, or that a graph gets smoother as they delete points.

“We did that in math!” is something I often hear when my digital design students use angles and polygons to create graphics or use random numbers and variables in a computer programming project. Creating artwork using vector graphics, making a geometric pattern by computer programming, and designing a building in a 3D coordinate system are intuitive ways to learn the STEM subjects.

Digital Design on a Limited Budget
At a time of historic budget cuts, how is this program possible in a public school district? First, all software used in our program is free—open source whenever possible and freeware (free versions or starter versions of software that is not open source) otherwise. Because the software is free, students install it at home and can continue to work beyond the classroom.

Second, curriculum development comes at no cost to the school and is now available under a Creative Commons attribution license. Last, our parents pay for teaching costs by generous donations to the Los Altos Educational Foundation. Most schools already have invested in computer lab setups, including both hardware and maintenance. This program leverages this existing infrastructure. It gives schools a way of using the computers they already have for more than just delivering class content.

Reactions from Students and Parents
As hundreds of surveys, online comments, and handwritten notes attest, students love the digital design class. The enthusiasm in class is palpable. The students rush in excited, and it often takes time to get some of them to leave. The excitement continues after class. Some even come in during recess or lunch, during the school computer lab’s open hours. As many have access to the free software on their home computers, they often use it at home. A fifth grade girl told me that she and her friends downloaded Scratch during a sleepover and spent the evening making a video game based on the one she had done in class. She excitedly waved her flash drive when she came into class, saying, "Can I show you what we made?" Not a typical girls’ sleepover!

It has been interesting to see how many students use the word creative or creating when they comment about using Inkscape to make graphics. Here is just one that echoes the feelings of many:

I like making different, cool things on it. It’s like being a scientist in a lab, creating creatures and characters. —Shannon

Parents are amazed at what their children teach them at home and are happy to see them designing and creating on weekends instead of just playing video games. Here is a comment from one happy parent:

Thank you for giving our kids the opportunity to explore the world of digital art. My son, Ryan, is very excited about the class and has already asked me if I could load the program you are using on our computer. It’s great to have him come home raving about what is going on at school!

—Andrea

Looking Ahead
At a time when many are expressing concern about the lack of AP Computer Science classes in our high schools or the need to encourage middle school girls in STEM subjects, it is easy to ignore technology curriculum in elementary schools. However, to ensure that our students opt for those high school AP science courses or choose STEM majors in college, we must catch them young and get them excited about technology in elementary school. We must challenge these students with real technology classes and not just teach drag-and-drop, template-driven presentation tools. A digital design program in elementary school shows students that learning technology is both relevant and exciting. It inspires and sets the stage for future exploration of technology. A digital design program shows kids what is out there and gets them asking for more. Most important, it gives them a safe place to experiment and learn to create and innovate.

Resources
Computers for Creativity: www.computersforcreativity.com
Digital Art for All: www.digitalartforall.com
Google SketchUp: http://sketchup.google.com
Inkscape: www.inkscape.org
Samples of student work: www.digitalartforall.com/lasd/digital-gallery
Scratch: http://scratch.mit.edu
Seashore: http://seashore.sourceforge.net

Sheena Vaidyanathan has taught visual arts and digital art in the Los Altos School District in California, USA, for five years. Prior to her teaching career, she worked as a computer scientist and technology executive.
In a darkened control room, the director confirms signal feeds for satellite transmission across the United States. The technical director programs a 10-bank switcher to ingest several pretaped video packages and animated effects. As the studio guest, 13-year-old Nancy Yi Fan takes her seat while engineers test sound levels and camera angles. The producer has just received word that third graders from Rural Hall, North Carolina, USA, will be calling in, and a Canadian school wants to participate via Skype the following month.

Welcome to Meet the Author (MTA), a televised series about the writing process produced by Fairfax County Public Schools (FCPS) in Virginia, USA. The production provides live access to authors using distance learning technology to reach thousands of K–12 students across the United States.

More than 200 schools within Fairfax County have access to MTA. The grant-funded program is also available for free to multiple broadcast systems outside the district that are registered through the Fairfax Network, the school system’s vehicle for distance learning education.

Meet the Author began as a way to support a change in writing instruction in the FCPS district in the early 1990s, before most children’s authors had websites. It was a unique resource for teachers back then, and to this day, it helps students keep up with new books.

Initially, programs were carried via copper cable, and every element of production happened in one small room. Today, the series is carried via optic signal to a satellite uplink facility for C-band satellite transmission as well as over the internet.

Pat Fege, coordinator of language arts instruction for FCPS, says the goal of the program is to get kids excited about reading. “Teachers and students are ever changing, but the need to reinforce the writing process, introduce new authors and books, and stimulate interest in reading and writing remains a primary goal of the program, and one that serves students and teachers,” she says.

Linking Students with Authors
As the program unfolds, students discover that accomplished authors use the same process they do: planning, drafting, revising, and editing. The strategies may differ from author to author, but as they share their know-how, accomplished writers help model essential concepts.

“We have a call,” says host Della Kidd. “Go ahead, caller, we’re glad you’re here!”

Jordan, a fifth grader from St. Lucie, Florida, USA, is patched through to the studio. “How were you able to publish a book at such a young age?” Jordan asks Fan, who is the youngest top-selling author ever featured on MTA.

“I went online,” Fan says. “I got a chance out of a million.” She explains that it all started when she emailed the CEO of a major New York publishing house.

The studio audience of middle school students is captivated by the author’s description of her fantasy novel about birds at war. She says Swordbird was inspired by a dream and influenced by the terrorist attacks...
of September 11, 2011, in the United States; her classroom study of the U.S. Revolutionary War; and an unusual enthusiasm for feathered creatures.

The control room’s director prompts an email from Tornado, West Virginia, USA. The Hays Middle School student wants to know if Fan uses a mind map to organize her thoughts. “Do you use a web or a diagram?” the student asks.

Fan replies, “I use those when I write essays [at school], but for writing a story, I don’t. I just get my ideas down.”

Every author has a different approach to writing, says Kidd, an assistant principal at an FCPS elementary school. “Engaging students in reading and writing is not a one-size-fits-all proposition. What will engage one student will not necessarily be a motivator for another.”

Students Question Writers
An informal advisory group suggests fiction and nonfiction writers to complement K–12 instruction, but final decisions and logistics are left to media specialists assigned to the program. They also give teachers information about how to prepare for each author’s televised/online visit, including logistical information about time, interactivity, channel, lesson plans, and etiquette of participation. Teachers let students know in advance which authors will appear, so they can read their books and prepare questions.

“Is a writer’s life boring?” a student asks Richard Peck, author of *A Year Down Yonder*, a Newbery Medal winner. “No, scary,” he replies. “There are those white pages that have to be filled up with voices. … It’s scary when your characters don’t talk to you, and it’s exciting when they do.”

From Big Stone Gap, Virginia, USA, a student asks Powell Valley native Adriana Trigiani how growing up in a big Italian family in a small Southern town shaped the writer she became. She responds: “It shaped everything I am today.”

A student named Justin from Maryland, USA, asks author Christopher Paul Curtis why there aren’t “more stories for black kids” and what instruments he plays. Curtis, who wrote *The Watsons Go To Birmingham 1963*, says he plays the saxophone, but not very well. Then Curtis challenges the student caller to “write down your stories,” adding, “No one looks at the world as Justin does.”

Justin may never look at his own writing the same way again.

Alexandra, a high school senior from Minnetonka, Minnesota, USA, remembers the program from elementary school. One show featured Daniel Handler, the creator of *Lemony Snicket: A Series of Unfortunate Events*. Alexandra recalled how “awesome” it was that her “questions were being answered by the author.” She went on to read all 13 books in the series and became “really interested in writing.”

Student viewers also learn the value of perseverance and possibly connect with life experiences rarely mentioned in the classroom.

Carmen Agra Deedy, a storyteller, poet, and children’s author, grew up as a Cuban refugee in Decatur, Georgia, USA. “You become the ambassador,” she says. “You represent your family to the American world, and you represent America to your family.”

Authors also have personal stories—beyond their own books—that...
unexpectedly percolate. Deedy said she grew up with dyslexia and probably undiagnosed attention deficit disorder. Myron Uhlberg translated for his deaf parents starting in kindergarten. Dan Gutman had dozens of rejections before he snagged his first publishing contract. Sharon Draper said her daughter told friends never to have conversations within earshot of her mother because the dialogue might end up in a book. And many authors reveal how they never thought they would become writers because as kids, they hated to read, and writing was too hard.

Typical questions from students go something like this: “Where do you get your ideas?” “What do you do when you get writer’s block?” “How do you develop your characters?” “Do you use a rhyming dictionary?” “What kind of research did you do for your book?”

Unexpected questions take a different turn: A student asks Shelley Gill, who writes about the Iditarod, the famous sled dog race in Alaska, USA, “Is it too cold to write in Alaska?”

Alphabet book writer Jerry Pallotta responds to: “What happens when you can’t find anything for the letter X?”

Orson Scott Card, a science fiction writer, takes a question from the studio audience: “How much of Ender is Orson Scott Card?”

And a student asks James I. Robertson, a civil war historian, “Why did Stonewall Jackson always have one arm raised when he rode his horse?” Answer: Jackson was an early “health nut” and thought it provided better blood flow.

Kidd says each writer approaches storytelling in a unique way, but what they all have in common is “persistence, always remembering their audience, having a plan, and having a method to record all their ideas for use now or perhaps in the future.” Authors also have the ability to handle constructive criticism, Kidd adds, “and use that to improve their own writing no matter how many times it may take.”

Constructive criticism is a form of evaluation. Meet the Author, like all programming offered through the school system’s Fairfax Network, uses an evaluation process to assess if programs are applicable and appropriate for classroom instruction. Producers send surveys to registered participants, an advisory panel, and informal focus groups to track who uses the program and stay attuned to the needs of classroom teachers.

Program Attracts Leading Writers

Meet the Author has won numerous Telly Awards, and in 2010, the series received a local Emmy nomination for best series in educational children’s television for the Washington, D.C., USA, metropolitan area by featuring local, relatively unknown author and illustrator Susan Stockdale.

The lead producer of the program, Robin Noonan-Price, believes all the elements came together in that episode. She incorporated phone calls, emails, and pre-taped video of Stockdale at home writing and drawing in addition to showing students using Stockdale’s books in the classroom.

“The show is a real team effort,” Stockdale says.

With continued support from Cox Communications and the instructional technology division of FCPS, MTA will celebrate its 20th anniversary in a few years. The series has built an archive of interviews of leading U.S. children’s writers, including Paula Danziger, author of the Amber Brown book series, and David Wisniewski, who won the Caldecott Medal for his book Golem. What remains constant about the series is that it gives teachers and students access to new content—stories for children rich in fact and fiction. Technology may change the format and reading habits of children, but authors will still have lots to offer students in terms of modeling the writing process.

Another 30-minute episode of MTA is about to come to an end. The school system usually produces six programs a year, depending on available resources. The director looks at the clock and knows the program signal will be cut from the satellite in seconds.

“Tell Della to wrap things up after this student caller,” the director says.

The producer communicates through the earpiece, and Della nods. The author is just sharing a few bits of advice. Shortly, the host of Meet the Author signs off with a familiar tagline: “Keep reading, keep writing, and keep dreaming!”

Resources
Fairfax Network: www.fcps.edu/fairfaxnetwork
Fairfax Network registration: www.fcps.edu/fairfaxnetwork/register/registration.html
Meet the Author: www.fcps.edu/fairfaxnetwork/mta

—Sandra Brennan is an award-winning producer of educational media for the Department of Information Technology for Fairfax County Public Schools in Virginia, USA.
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Ten Surefire Ways to Destroy Your Twitter Cred

Perhaps you are new to Twitter, or maybe you have been around for a while. If your presence on this social network has not taken off as you had hoped, then it might be time to take a look at how you are actually using it.

I have been on Twitter for more than three years, and during that time, I have gotten a handle on what works and what doesn’t typically go over so well. While there are no hard-and-fast rules, there are social norms that the community adheres to. We follow these norms to remain in the good graces of our peers and to set a positive example of how educators can use Twitter to develop a strong and meaningful personal learning network (PLN). Most people understand we are human and are willing to forgive a slip every now and then. But paying attention to these 10 no-no’s will help you get a handle on your Twitter cred.

1. **No profile picture or description.** Unless you have a very good reason for not using a clear picture of your face, people are probably not going to follow you. Why? Most educators use Twitter to connect to people who are willing to share and be transparent. The same goes for your profile. You have 160 characters to “sell” yourself in your description. Neglecting to fill out that vital piece of information can be costly. At the very least, you should indicate yourself in your description. Neglecting to fill out that vital piece of information can be costly. At the very least, you should indicate yourself in your description. Neglecting to fill out that vital piece of information can be costly. At the very least, you should indicate yourself in your description.

2. **Constant retweets.** Retweets, or RTs, are a great way to share information that you find useful, interesting, or entertaining. But if that is all you ever tweet, you are doing it wrong. Twitter is about interacting with people and sharing what you are learning. Try engaging someone in a conversation.

3. **Tweeting about all of your interests from one Twitter account.** This norm is tricky because it is all about balance. Everyone has her own limits for the number of noneducation tweets she can tolerate from one person. Near everyone I know on Twitter tweets about things other than education on a regular basis, which is wonderful. We are forming relationships when we share family pictures or engage in lively exchanges about who is going to win the World Series. There is no magic formula to figure out if you are tweeting too much about things not related to education. If you are not sure, look back at your last few dozen tweets. What do they say about you? If you are truly passionate about another topic, consider setting up an account specific to that interest.

4. **Posting inappropriate images and videos.** Nothing can destroy your Twitter cred (or professional reputation) faster than sharing images that should be kept off the public timeline. Maybe you find a humorous picture that you want to share, so you post it for everyone to see. Chances are, a few people will reply, but many more will be shaming their heads, wondering what you were thinking. Posting images of yourself or other educators engaging in activities that might be frowned upon is not wise either. Imagine one of your students or a parent finding a picture of you sitting at a table full of empty beer bottles. There are still some districts where that would not go over well.

5. **Using foul language.** Educators typically frown upon bad language in the Twitter community. However, there are exceptions. If you have a solid reputation on Twitter, then you can probably get away with an occasional tweet in which you swear. If you are still trying to establish your reputation and credibility, it is probably wise to refrain from cursing.

6. **Using slang and text lingo.** One of the Twitter etiquette guidelines I learned three years ago was to use standard English when tweeting. Since more people have been using their phones to send tweets, this seems to have fallen out of style, and it is mostly a personal pet peeve. It annoys me when people send very short messages yet feel the need to abbreviate everything. There seems to be an acceptable set of abbreviations for Twitter, but when I see tweets that look like a text message a 14-year-old would send, I can’t stand it! When you send someone a tweet that says something along the lines of, “Thanks, u r gr8!” you are telling them they are not worth the few extra seconds it would take to spell out the words. None of us is that crunched for time!

7. **Excessive blog promotion.** Twitter seems to be replacing the RSS reader. I will confess I have not checked my reader in many months. Educators are great about tweeting out links to their posts as well as sharing blogs written by others. The problem with this is when someone tweets out the link to his new post over and over and over. I typically send out a link so it hits the East Coast early in the morning, then again late in the afternoon. Others might have a different strategy. If it is a decent post, I know I can count on others to circulate it by tweeting out the
Retweeting a post you haven’t read. As the purpose of a retweet is to share information, it only makes sense to use it to share relevant information. There is no way to know if what you are sharing is any good unless you read it first. It is not good practice to retweet something, even from a trusted and respected source, without taking the time to check it out first.

Snarkiness. We all have bad days. At times it seems like people take out their anger on Twitter. I have seen Twitter users call people out for a tweet that may have been taken out of context. Composing a tweet that captures a complete thought in 140 characters is not always easy. Sometimes we are in a hurry and don’t have time to wordsmith our tweets. It seems like some are just waiting to pounce all over these tweets. They live to argue with people over word usage, and heaven forbid you make a simple spelling error! Some use their voice on Twitter to diminish others’ efforts to help provide opportunities to learn, connect, and collaborate. There is no need for this. Providing legitimate pushback is one thing, but starting a spat just for the sake of engaging someone in an argument is petty.

Playing the drama or sympathy card too frequently. Everyone craves attention and needs sympathy from time to time, but there are reasonable limits. It is great that we are comfortable enough with our PLNs to reach out to them for support, but sometimes this might be best accomplished through direct messages to one or two people. We all have bad hair days, spill things, and feel like there are times when we can’t do anything right. Reading a play by play each time something goes wrong during someone’s day can be exasperating.

It isn’t necessary to fret over every tweet. But it’s important to be aware of the pitfalls to avoid. If you have been on Twitter for any length of time, you’ve likely violated one or two of these norms. We are human, and from time to time we are all guilty of engaging in behaviors that might offend others. The Twitter community tends to give people many chances before we boot them out of our PLNs. The key to building Twitter cred is to follow these norms on a regular basis. If someone chooses to unfollow you because you send questionable tweets every once in a while, then they are probably not someone you want in your network anyway.

―Beth Still teaches social studies for Educational Service Unit #13 in Scottsbluff, Nebraska, USA. When she is not teaching, she enjoys learning with her colleagues on Twitter. She also writes the Nebraska Change Agent blog at http://bethstill.edublogs.org.
Web Adventures: Explore Science One Game at a Time

With the widespread use of computers and mobile devices, students are accustomed to being plugged in. The Rice University Center for Technology in Teaching & Learning has developed games, called Web Adventures, that demonstrate the educational outcomes that are possible when students use online games for science. Both students and teachers tell us that Web Adventures generate enthusiasm for learning.

Web Adventures Explore Science
Web Adventures are thematic interactive games and simulations driven by specific learning objectives (http://webadventures.rice.edu). The idea was to create a free online environment that allows students to explore science concepts, conduct virtual laboratory investigations, and role-play science careers. To play Web Adventures, all you need is a computer with internet access and Adobe Flash Player.

We have developed five themed Web Adventures:

- MedMyst covers infectious diseases.
- N-Squad addresses the impact of alcohol on three body systems.
- Reconstructors uses a neuroscience approach to explain the impact of substance abuse.
- CSI illustrates basic forensic techniques to solve a crime.
- Cool Science Careers applies a virtual apprenticeship approach to explore science careers.

How to Use Web Adventures
We wanted to make it easy for educators to find the best match for their specific science curriculum, so we developed a searchable teacher version that spells out the learning objectives, describes the science concepts, and offers complementary materials. Internet scavenger hunts, quizzes, and hands-on activities reinforce concepts that the games teach; vocabulary lists cover new terms; and links take students to related age-appropriate sites.

Teachers can select games and activities to create a formal embedded lesson or a standalone unit—whatever best suits their needs.

Very neat! I like the way it’s set up. Students can be successful at different levels of ability, and there are some video game-type things in there to keep it interesting! Nice job!! —Teacher

By Kristi Bowling and Leslie Miller
We wanted to design Web Adventures in a way that would not only appeal to students but would also support teachers in reinforcing standards. Web Adventures aligns to many of the National Science Education Standards and several of the National Health Education Standards.

Because Web Adventures is a digital tool for learning, it also meets ISTE’s NETS for Students in the areas of using models and simulations to explore complex systems and issues and exhibiting a positive attitude toward using technology that supports learning. This online tool also meets the NETS for Teachers for facilitating and inspiring student learning and creativity, designing and developing digital age learning experiences and assessments, modeling digital age work and learning, and engaging in professional growth and leadership.

Web Adventures provides a way for science and health teachers to plug in to an online digital environment that is grounded in learning theory. A growing body of evidence supports the efficacy of Web Adventures for teaching science and inspiring science, technology, engineering, and math careers. In addition, teachers report that students develop a better understanding of science concepts and of the procedures used in laboratories after playing Web Adventures because the games provide a visualization of what they read and allow students to conduct experiments not possible in a school science lab. Check them out at http://webadventures.rice.edu. You might find your students praising your assignment selection!

—Kristi Bowling, PhD, is a science education specialist at the Center for Technology in Teaching & Learning at Rice University in Houston, Texas, USA.

—Leslie Miller, PhD, is the executive director of the Center for Technology in Teaching & Learning.

Educators have reported many ways they have adapted Web Adventures for their own classrooms. Some use a specific Web Adventure at the beginning of a unit to engage students in the topic, others use them at the end of a unit as a culminating activity, and some use them as end-of-year reviews.

Can’t get access to the computer lab for the 30–40 minutes it takes to play one segment? Connect your classroom computer to a projection system. What do you do about students who complete the games at different times? At the end of each game, a list of vetted links allow students to continue learning online. Not enough time during class to play Web Adventures? Give the games as an extra credit assignment.

Meet Education Standards

Cool Science Careers

This was an assignment for school, and it was fun, so I came home and started doing the cases!

—Student

This website is the most attractive school assignment to get—keep up the good work!!!

—Student

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It’s 9 a.m. on a cold, gray Saturday in December, and most students are at home sleeping. But at the St. Johnsbury Middle School, in St. Johnsbury, Vermont, USA, 24 fifth through eighth graders rush into the computer lab, log on to computers, and start playing video games. It is not the mindless endeavor that one might envision when kids are gaming. These kids are participating in a grant-funded project called Saturday School. Directed by Leslie Ercole, a St. J middle school mathematics teacher, Saturday School teaches students academic content through project-based learning. It’s funded by a grant from the Vermont Department for Children and Families Youth Justice Unit, and the five video gaming sessions align with President Obama’s initiative to promote science, technology, engineering, and math (STEM) education.

“My mom made me come!” Alex, an eighth grader, admitted. But she would soon find her own reason for wanting to join Ercole’s Saturday School.

Ercole is an experienced mathematics teacher but is the first to admit that she knows little about video game design. Fortunately, project-based learning doesn’t require the teacher to know everything.

For this game-design project, Ercole and I used Gamestar Mechanic, a game and community that teaches kids the principles of game design and systems thinking in a highly engaging environment. We joined students in learning through play. While we struggled to advance through the levels, students immediately took to the Gamestar Mechanic platform, and as Alex explained, students learned to make a game by playing a game. “You play it, and then you get to make your own games during the video game.”

Although there are many engaging free web-based creative programs out there, Gamestar Mechanic is worth purchasing. It is an online gaming site with both free and premium educational packages geared toward grades 4–9. We used the premium classroom package, which was $85 per classroom for one year, which includes one teacher account and 40 student accounts. The difference between the free and paid versions seems to be the ability to wall your classroom, a few game-design niceties, and direct support.

Ercole and I began by creating our own free accounts to see what the students would be seeing. After finding that it offered more than enough for this project, we upgraded to the premium classroom package. One of the best features is the teacher resources and personal support. Any problems we had with logins or our system crashing were taken care of with a call to tech support. The teacher lesson guides are comprehensive, easy to access, and grounded in good project-based learning pedagogy.

By Elizabeth McCarthy
Creative Thinking and Problem Solving
According to the Gamestar Mechanic guide, users engage in “system-based thinking, creative problem solving, collaboration, art and aesthetics, writing and storytelling, interactive design, and digital media literacy. The game designer must also be a socio-technical engineer, thinking about how people will interact with the game and how the game will shape both competitive and collaborative social interaction.” All of these activities include digital skills that students will need to become successful in almost any future profession.

We observed evidence of these skills as students created their own games. Fifth grader Christian explains the premise of his game, which he hopes to enter into the STEM Video Game Challenge, a national youth video game competition. He designed a multilevel game called Coral Reef, in which players must maneuver past the ocean junk that lines the colorful reef to earn points by cleaning up oil and other pollution. Nichole and Courtney worked together to design a game that follows a Greek mythology storyline. First they researched which Greek characters would be worthy of their game.

Although the goal of Saturday School was not to produce polished games for the competition, we encouraged students to give it a shot. Most students merely enjoyed creating games and having fun with like-minded students.

Students learned that games require a story line as well as engaging characters and themes. But they also learned how to design dynamic systems and seek and provide critical feedback that’s essential for their games to improve.

Gamestar’s focus is geared toward the essential elements of game design and does not include actual programming to make things work. It is a pathway to programming-focused applications, such as Scratch or GameMaker.

Rave Reviews for Saturday School
We invited parents to attend the final Saturday School session to view the games that students had designed and listen as their children explained how they created them. The consensus from both students and parents about this program was overwhelmingly positive. One parent said, “I think it’s a great opportunity for the kids to learn things and have fun.”

Another remarked, “It is excellent. My kids were excited to come and enjoyed what they were doing.”

To see a video of the kids talking about their game designs, go to http://tinyurl.com/7hhye6a.

Beyond Saturdays
Since the first Saturday School ended, Ercole has added project-based learning to her classroom, including a data and statistics unit where students become forensic investigators to solve murder mysteries. She is always looking for opportunities to bring project-based learning ideas to members of her middle school team.

As students shut down their computers and said their goodbyes, Alex was asked if she would do this again. She replied, “Yes, definitely, only next time maybe it could start a little later in the day so I can sleep in some.”

—Elizabeth R. McCarthy is a technology integration specialist for the Washington Central Supervisory Union in Vermont, USA. She is an aspiring poet and lives in an old farmhouse with her husband, cat, and young adult children.

Drag and Drop Your Way to an Appealing Presentation
Problem: Your students need a free alternative to PowerPoint to share their work online.

Here’s a solution: Simplebooklet.com is a free online tool for constructing interactive, media-rich booklets of any size imaginable. After signing up for a new account, click to start a creation and drag the bottom right-hand corner to adjust the size of the booklet. The user-friendly interface allows teachers and students to focus on content while developing an eye-catching presentation. On each page, drag and drop images, videos, audio files, text, and other customizable elements. Choose a background from a library of funky and fresh themes. Turn pages by clicking on the top right-hand corner. With Plus accounts (free for teachers, $10 a year for all others), students can also collaborate on their web booklets by adding editing permissions. You can easily share and embed web booklets on class websites.

Hannah Walden is a high school English teacher at Calvary Christian Academy in Philadelphia, Pennsylvania, USA. In addition to teaching, Walden helps her coworkers integrate technology into their various disciplines. Explore her class projects at http://techielit.com and follow her on Twitter @techielit.
## Literacy iPad Apps for Teachers

### APPS FOR ELEMENTARY GRADES

<table>
<thead>
<tr>
<th>App Name</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build a Story</strong></td>
<td>$3.99</td>
<td>This app is easy for young children to use. It comes with a variety of default settings and ready-to-use characters and props. Students create the illustrations and type their stories, making this app ideal for reinforcing fictional story elements, such as character, setting, and plot. A main drawback is that editing the story is not easy, so I would suggest that students prewrite their stories using a storyboard and use this app as a publishing mechanism.</td>
</tr>
<tr>
<td><strong>LAZ leveled reading libraries</strong></td>
<td>Free +</td>
<td>(Paid libraries at each level cost $3–$6.) Teachers familiar with the Reading A–Z website (<a href="http://www.readinga-z.com">www.readinga-z.com</a>) will appreciate this app, where they can find leveled books in e-reader format. I especially like this app because parents could also use it to find books that their beginning and early readers can read on their electronic devices.</td>
</tr>
<tr>
<td><strong>Mad Libs</strong></td>
<td>Free</td>
<td>My own two children (ages 9 and 13) have actually been known to play together without fighting when I allow them to use my iPad to play Mad Libs. They said, “This is way better than the regular [paper] kind because you don’t know what the story will be until the end!” I like it because it is fantastic for broadening their vocabulary. Can’t think of an adjective? No problem! Click on “hint” and an ongoing scroll of words they probably wouldn’t have thought of rolls across the screen with gems such as zany, ecstatic, and starving.</td>
</tr>
<tr>
<td><strong>Sadun’s Whiteboard</strong></td>
<td>$2.99</td>
<td>Since this app’s original development, its creators have added some cool features, such as different colors of markers, a typewriter tool, and a hidden message option. And what could be better than a whiteboard with markers that never run out of ink? Kids can write with their fingers or use the typing tool.</td>
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<tr>
<td><strong>iBooks</strong></td>
<td>Free +</td>
<td>(Full-color picture books run $3.99–$12.99; chapter books cost $3.99 to $12.99, depending on how recently the book was published.) This is Apple’s answer to e-books, and it rocks! The app comes with a complimentary copy of A. A. Milne’s classic, Winnie the Pooh, and a library with lots of empty shelves that just beg to have more books added to them! Many other classic titles are free as well, such as Alice in Wonderland, The Ugly Duckling, and The Velveteen Rabbit. What makes this app stand out from other e-readers are the full-color pictures and page-turning features.</td>
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By Jennifer Shettel

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If you’re just getting started using apps in the classroom, you’ll discover that there are so many that it can be daunting to choose which are right for you. So I’ve compiled a list of my favorite free or low-cost reading and writing apps for elementary students and for middle and high school students.

The one problem I’ve found with apps is that once you buy one, you can’t return it if it turns out to be a dud. Good thing so many excellent free ones are out there to get you started! Happy shopping!

**Frosty Welcome** Free

Letters that look like they are on a whiteboard move easily with your finger. Students can use them like magnetic letters to spell words, practice the alphabet, or sort letters into categories. This free app contains only lowercase letters, so that could be a drawback. This app contains an email feature so students can send home their “fridge messages.”

**Puppet Pals HD** Free +

(Contains one free sample pack; other packs available for 99 cents each, or buy the director’s pack for $2.99.) The theater lover in me adores this app! Imagine your students’ theater presentations coming to life! Students select characters from different theme packs, choose a backdrop, and go to town recording and watching their shows. This app comes with the Wild West pack for you to play with, but I recommend purchasing the Director’s Pass for only $2.99, so you can have access to all the theme sets including Fairy Tales, Politicians, and Zombies, to name just a few.

**USA Today** Free

Can’t afford to subscribe to the newspaper for your classroom? No problem! USA Today is a free app that looks just like the paper copy—full color, with plenty of news, maps, charts, and graphics. All the features teachers love about this newspaper are the same on the app. Students can read it like a traditional newspaper or jump to different sections by touching the screen.

**Shake-n-Spell** Free

I love word games for building fluency and flexibility in spelling, phonics, and vocabulary. This is a fun game that reminds me of the board game Boggle. You even shake the mobile device to start the game! I also like how you can select a time of one, two, or three minutes—built-in differentiation for various levels of learners! This one is a big hit with my own children. Technically, this is an iPhone app, but it works just fine on the iPad.

**Wild about Books!** $4.99

More and more interactive e-picture books are coming to the app market. I love this story because it’s about reading. There are many interactive places for kids to “play” in the story. The words light up when the reading is happening, and the voice sounds natural—not robotic at all. Turn off the sound so students can practice fluency by saying the words as they light up!
APPS FOR MIDDLE AND HIGH SCHOOL GRADES

**Constitution and Declaration for iPad**  **Free**
Actually, these are two separate apps. Each is a no-frills app that allows students to read one of these historical documents on the iPad. In the Declaration app, students can view and read an image of the original parchment Declaration of Independence and find out more information about each of the signers. In the Constitution app, readers can search by article or amendment number, read the full text, and read notes relevant to each section. Keep in mind that both of these seminal texts are included in the new Common Core State Standards for English language arts. And you can have these primary-source documents literally at your fingertips!

**Marvel Comics**  **Free +**
(Paid issues are $2.) I am a big fan of using comics and graphic novels in the classroom. These texts appeal to striving readers and are popular choices for boys, although many girls like comics too. The full-color pages with high-quality graphics and easy-to-read text really make this app pop! While you can download a few comic books for free, you will need to sign up for a username and password to download other titles.

**SAT Vocab Cards**  **Free**
Paid SAT apps abound, but this one is free. It’s not as flashy as some of the others, but it offers a quick and easy way to build vocabulary without slogging through hundreds of workbook pages. There are two components: flash cards and quizzes. The app has nearly 1,000 flash cards, and it is possible to master the entire load. You can control the quiz feature to include all the cards or narrow it down by selecting options, such as “never quizzed” or “answered poorly.”

**Poem Flow**  **Free**
You get 20 poems for free and can pay to add more. A library of 100 poems costs 99 cents. This app features both contemporary and classic poets as well as the “poem of the day.” I love how the poems literally flow across the screen for a unique reading experience with this oft-neglected genre. Hook your iPad up to a projector or lay it on a document camera to have a poem flowing across the screen or interactive whiteboard as students enter the classroom.

**Newspapers for iPad**  **$2.99**
If you want a free newspaper for your classroom, I highly recommend USA Today. It is a high-quality, full-color app that looks just like the paper version (see Elementary Grades for details). If you want something more, I suggest Newspapers for iPad. For only $2.99, you can catch up on the news from all over the world! This awesome resource provides you with a quick and easy way to select a location and then click for the link to the newspaper’s website. You will need to be online for this app to work, but you can email articles or save them to the Instapaper feature to read later offline.

**iTranslate**  **Free +**
(The basic version of this great translation software is free; upgrade to a more deluxe version for about $4.) This is a very sophisticated app. You can translate written English into more than 50 other languages, or you can flip it and translate into English. Some languages (not all) come with a text-to-speech button as well, so you can hear how to say it and see how it’s written. This is a great app for English language learners and foreign language classes.

**Free Books**  **Free**
You get 23,469 free books and/or documents from the public domain. Many of these same titles are available through other e-readers (iBooks, Nook, Kindle), but I love how this app’s library comes already pre-organized into categories such as Banned Books, Classic Psychology, Epic Epics, and more. You need an internet connection to download the titles you want, but once you’ve done that, you can read the books even when offline.

**Shakespeare**  **Free +**
(Upgrade to Shakespeare Pro for $9.99.) This is a fantastic resource for any English teacher. The free version features the complete works of Shakespeare plus a searchable concordance. Want to find all references to poison? No problem! Type it into the concordance, and every line in any play, poem, or sonnet with the word poison immediately appears. The “pro” version contains some added features, such as a glossary and a portrait gallery, but the free version is probably enough if your goal is to have multiple copies of each play.

**Goodreads**  **Free**
This is a social networking site for readers. Have your students rate books, get suggestions, and even form book groups online. It is a great way to use social networking, but with a literacy angle. Get the teachers in your school to start using Goodreads and form your own student/teacher groups. Students must be 13 to set up an account.

**iFound Poetry**  **$1.99**
This is one of my favorite “magnetic” poetry apps. The manipulative words and word parts look just like the real game, but this app comes with lots of options. You can change the words by choosing a different theme, and you can create your own words to use in the poem. You can change the background image and the fonts of the magnets. Best of all, students can share their poems through email, Facebook, and Twitter, or they can save them to a photo library. This app brings the idea of “found poetry” to life and would be a great addition to a unit on the genre of poetry.

—Jennifer Shettel is an assistant professor at Millersville University of Pennsylvania, USA, where she teaches courses in literacy education. She presents on how to use apps in literacy classrooms.
Summative online assessments may be coming to your state beginning with the 2014–15 academic year. In 2010, the U.S. Department of Education awarded funds to two multistate consortia under the Race to the Top Assessment Program to develop summative state online assessments “that are valid, support and inform instruction, provide accurate information about what students know and can do, and measure student achievement against standards designed to ensure that all students gain the knowledge and skills needed to succeed in college and the workplace.” These assessments will be tied to the Common Core State Standards for mathematics and language arts/literacy.

The two consortia that received grants are the SMARTER Balanced Assessment Consortium (SBAC, www.k12.wa.us/SMARTER), which comprises 28 states, and the Partnership for Assessment of Readiness for College and Careers (PARCC, www.parcconline.org), which has 24 member states.

As required by the Department of Education, the assessments are “intended to play a critical role in educational systems; [and] provide administrators, educators, parents, and students with the data and information needed to continuously improve teaching and learning....”

The consortia are working with the K–12 and higher education communities to develop the assessments and other supporting tools. In addition to the end-of-year assessments, both consortia will provide states with interim assessments that they can voluntarily implement during the school year. Students can take both on computing devices, and SBAC assessments will be computer adaptive.

Developing these assessments is ambitious and will change the way states assess students. Effective implementation in schools will be equally challenging. ISTE members know all too well that network capability and lack of computing devices can be a significant hindrance. Additionally, schools need personnel in place to handle technical problems when students take the assessments, and states and districts will need to furnish assessment proc- tors to provide training in basic troubleshooting and navigation before students sit for them.

Of course, students will need digital literacy skills and have classroom learning experiences that will enable them to demonstrate proficiency on these new digital age assessments. For example, the PARCC assessment will test students’ “ability to read complex text, complete research projects, excel at classroom speaking and listening assignments, and work with digital media.” Facing this kind of assessment without complementary classroom learning experiences will only result in student failure.

Do you think your school or district will be ready to implement these assessments in academic year 2014–15? If not, I encourage you to educate your district and state leaders about what schools need “on the ground” for successful implementation. In addition, contact local and state policymakers to discuss funding and personnel allocations to ensure students are prepared to succeed on the new assessments.
How can we ensure our school’s technology resources have a meaningful impact on student learning? What professional development and tech support will most benefit our teachers?

My name is Guy and I’ll be looking to answer these and many other important questions at ISTE’s leadership conference.

Attend ISTE’s leadership conference to...

• Engage with content centered around the NETS, essential conditions, and digital age teaching and learning
• Participate in focused sessions and collaborative activities
• Be empowered to make real and positive change with actionable plans
• Learn to articulate the need for educational transformation
• Acquire the information, tools, resources, and networks to support immediate action

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ISTE has two books coming out soon. **Nets for Students: Curriculum Planning Tool** provides examples of what the NETS-S look like in practice and discusses the measurable skills students are expected to achieve at various age levels. It includes content-related examples of activities and tools that build proficiency and will be available in March. **Intelligence Quest: Project-Based Learning and Multiple Intelligences** by Walter McKenzie brings together ideas from multiple intelligences and project-based learning to develop a new instructional model, the Intelligence Quest (IQuest). This flexible, self-directed learning-journey approach provides educators with a clear structure and specific goals for a technology-infused classroom. It will be available in April.

**MORE INFO:** [iste.org/store](http://iste.org/store)

Scholastic has launched **Teaching with Brian Selznick**, a new website that focuses on a virtual field trip. Visitors can tour the American Museum of Natural History, which is the setting of Selznick’s bestselling children’s book, *Wonderstruck*. The virtual field trip includes activities for each stop on the tour to help students and teachers explore the subject matter through science, language arts, social studies, and art.

**MORE INFO:** [www.scholastic.com/teachers/collection/virtual-field-trip-teaching-resources](http://www.scholastic.com/teachers/collection/virtual-field-trip-teaching-resources)

The Association for Supervision and Curriculum (ASCD) is offering **two free professional development opportunities** among a series of preconference institutes leading up to the 2012 Annual Conference and Exhibit Show in Philadelphia, Pennsylvania, USA, March 24–26. The two preconference institutes on March 23 are Leadership Matters: Accomplished Principals Bring Results, led by education consultant Joan Auchter, and Developing Teacher Leaders for Increased Student Learning, led by education consultant Wil Parker. In addition, ASCD will offer a variety of one-, two-, and three-day institutes March 21–23. These professional development events, led by national experts, including ASCD authors and staff, education consultants, and more, will cover topics such as differentiated instruction, upgrading curricula for 21st century learners, and implementing the Whole Child Initiative in schools.

**MORE INFO:** [www.ascd.org](http://www.ascd.org)

ICivics, an organization founded by retired U.S. Supreme Court Justice Sandra Day O’Connor, is marking the 2012 U.S. presidential election with the launch of a free online video game, **Win the White House**. In the game, students take on the role of a presidential candidate from primary season through Election Day, learning the ins and outs of the electoral process. Students have to make tough choices about their party; platform; vice presidential selection; and how to raise funds, conduct polls, and spend valuable campaign dollars on appearances and advertisements. News coverage recaps their successes and failures as they campaign for their 270 electoral votes.

**MORE INFO:** [www.icivics.org/games/win-white-house](http://www.icivics.org/games/win-white-house)
Educreations has released an app for the iPad that turns your tablet into a recordable whiteboard. The Educreations Interactive Whiteboard app allows educators to create video tutorials by touching, tapping, and talking. You can easily explain a math formula, create an animated lesson, add commentary to photos, diagram a sports play, and more. When you’re done, you can email the files, share them on social media sites, or post them on the web.


Discovery Education and the Outdoor Power Equipment Institute have expanded the TurfMutt program to include content for students in grades K–2. Designed to get students outside investigating the benefits of landscaping and recycling, TurfMutt online lessons and resources help students understand the importance of yards, flowers, bushes, and trees.

**MORE INFO:** [http://turfmutt.discoveryeducation.com/homepage.cfm](http://turfmutt.discoveryeducation.com/homepage.cfm)

The Azend Group has released the **ZIPPY BT-500**, a compact wireless keyboard that supports most Bluetooth-enabled devices, including Apple’s iPad 1 and 2, the iPod touch, and the latest releases of iOS5 and iPhone 4S. The ZIPPY BT-500 connects to six Bluetooth devices simultaneously and features one-touch fast-switch technology between all six devices in a matter of seconds. The Media Function keys allow the user to change the volume, scroll through sound tracks, launch the web browser, and much more with one touch. In addition, this compact wireless keyboard has a transmission range up to 33 feet and is compatible with smartphone devices, PDAs, and tablet PCs equipped with Bluetooth technology.


**Bring Back the Boys**
Alarming statistics indicate that boys are tuning out of learning because school culture is out of sync with boy culture. Alison Carr-Chellman, a professor at Pennsylvania State University, USA, suggests that using video games in the classroom is one of many ways to re-engage boys in their education.

**AlMing for Digital Equity**
How do we ensure that instructional materials are universally designed to be flexible, accessible, and usable for all students? Authors Gayl Bowser and Joy Zabala address the importance of accessible instructional materials (AIM) for students with and without identified learning disabilities.

**Get Results with Formative Assessment**
Cate Sommervold and Melissa Goodwin describe how teachers in their South Dakota school district improved learning outcomes by participating in a one-year professional development program on integrating digital age skills into the classroom and using formative assessments to improve their teaching.

**COMING NEXT ISSUE**

**Should corporations run publicly funded online schools?**

Debate this and other controversial issues at [www.iste-community.org/group/LandL](http://www.iste-community.org/group/LandL)
Houghton Mifflin Harcourt’s HMH Fuse: Algebra 1 app for iPad redefines our notion of the textbook and challenges us to consider how digital textbooks might shape instruction in the modern mathematics classroom.

I must admit, as I launched this app for the first time, I thought, oh no, this is just a digital version of the paperback. It looks just like the pages of the textbook, and the iPad acts just like a Kindle. Was I ever wrong! I identified significant differences between the paperbound version and the digital version that actually caused me to rethink what a textbook is and how it is used for teaching Algebra I.

The app has chapters with typical algebra titles, such as equations, inequalities, and linear functions, just like the hard copy. However, the iPad version is multidimensional. The content appears to be the same, but the iPad presents it in dynamic ways that address multiple learning styles, including visual, verbal, auditory, and tactile. Throughout the app, students proceed by actively swiping the pad to move to the next step in a solution or an example. This active process has the capability of focusing their attention on the ideas and the problem-solving processes they are exploring. Active engagement with problem solving clearly aligns with the Standards for Mathematical Practice in the Common Core State Standards for Mathematics (CCSS-M, 2010), which requires students to “make sense of problems and persevere in solving them.” Multiple features in the digital textbook support this engagement.

Lesson Tutorials offer videos for each chapter with an actual person teaching the lesson. The videos allow students to review ideas from the class instruction, progress at their own speed, and pause and rerun the videos until they understand the ideas. The videos provide access for absent students and even parents who need refreshers. When the teacher is absent and the substitute is not a math teacher, she can use the videos to introduce concepts and processes.

The Practice and Problem Solving pieces contain links to check answers and get extra practice and help. The Homework Help button gives hints for specific problems and directs students through the steps of solving a problem.

Math Motion is a feature that allows students to investigate a problem/solution, one step at a time with individual swipes of the screen. They are able to proceed at their own pace, progressing their way systematically to comprehension of a solution, rather than seeing the entire answer presented in a single step.

The Notes tool at the top of each page links to a space for students to either record their ideas with a keyboard or by audio recording. The Tools link helps students address CCSS-M standards, particularly the standard for learning to “use appropriate tools strategically.” Throughout the textbook, students must select the appropriate tools for each mathematics problem in ways that help them “explore and deepen their understanding of concepts.”
Algebra Tiles explores concepts like squaring binomial expressions using virtual expressions, such as a visual representation of $(x - 3)^2$ to examine why the solution is $x^2 - 6x + 9$ and not $x^2 + 9$.

The Linear Explorer tool allows students to explore the slope and $y$-intercepts of linear functions actively, using sliders to make changes in the values and seeing the immediate implication of those changes in the graphical representation. A Quadratic Explorer tool is available for students to explore quadratics in much the same way. The Graphs and Table tabs are available to support students in making connections among different mathematical representations—graph, table, and symbolic. All of these tools support the CCSS-M standard that challenges proficient students to use multiple representations to model the mathematics and to draw conclusions such as the graphical meaning of the slope $m$ and the $y$-intercept $b$.

The textbook app includes homework problems and quizzes for each chapter. Students can use the Scratchpad to solve problems and check solutions before submitting the results to the teacher through iPad’s internet capabilities. The program supports teachers by providing an online resource to track student progress. Teachers see the results for tests and quizzes within the iPad app. They can also view students’ homework problems, quizzes, and tests in one place.

Kristen McKee, who taught at Philomath Middle School in Oregon, helped me review this digital textbook. Her views were helpful in changing my initial views of this app. Here is how she summed it up:

It’s like having a mathematics lab in the textbook that also includes a graphing calculator. Now students need only their iPad instead of their textbooks, calculator, and notebooks!

The app is clearly a dynamic tool with potential for improving how students learn algebra. But teachers are still the key, and they will need to experiment with different instructional strategies when guiding student learning with this tool.

HMH Fuse: Algebra 1 (version 1.4) is compatible with iOS 5 or later and requires 553 MB of storage space. It is available for download from iTunes.

Houghton Mifflin Harcourt
$59.99 www.hmheducation.com

Margaret “Maggie” L. Niess is professor emeritus of mathematics education at Oregon State University, USA. Her teaching and research has focused on TPACK and developing teacher knowledge for teaching with technologies in mathematics and science.
Bringing the NETS to the Middle East and Beyond

Mahmud Shihab was like a kid in a candy store in 2003 when he attended his first ISTE conference. He had just been named head of educational technology at International College in Beirut, Lebanon, and was sent to the Seattle conference to explore technology tools, software applications, professional development opportunities, and integration techniques to share with teachers at his school.

“It was an amazing experience,” he recalls. Not only did he bring great ideas back to the teachers at International College, he says, but over the years he has shared resources, ideas, professional development, and other information gleaned from ISTE with educators around the world.

Shihab is in his second year as an ISTE Ambassador, a program designed to connect international members to each other and to the resources in their country or region.

Shihab, who represents the Middle East, has been a perfect fit for the program, says Jessica Medaille, ISTE’s senior director for membership development. “He’s a highly respected ICT thought leader, conference presenter, and champion of the NETS, and he’s been a longtime volunteer contributor for ISTE,” she says.

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Shihab is grateful for the opportunity. “The ISTE Ambassador Program has helped me reach more educators in my local and international communities,” he says.

In addition to his home country of Lebanon, Shihab has attended—often as a presenter—education conferences in Greece, Thailand, Egypt, Qatar, United Arab Emirates, the United Kingdom, Oman, France, Austria, and the United States. When it comes to his success at integrating technology—or advising others about it—Shihab says he has many tools, but only one is indispensable: the NETS.

“In my capacity as educational technology program administrator, educational technology lecturer, and teacher trainer, I have used ISTE’s NETS at the core of my workshops and presentations,” he says. “ISTE has always been at the heart of discussions relating to ed tech integration, planning, and professional development.”

When Shihab realized the NETS weren’t accessible to everyone he presented to because they were published only in English, he saw an opportunity. “I realized that we needed to translate the NETS into French and Arabic, and I was happy when ISTE encouraged me to do so,” he says.

The task of translating the NETS actually gave him a keener understanding of the standards. “It pushed me to go deeply into the meanings of every word in the standards and look up equivalents in professional references in the three languages,” he says.

Now all the teachers at International College use the translated NETS (iste.org/standards/global-reach.aspx), and Shihab hopes other French and Arabic speakers will find them useful as well.

Shihab has always been a technology buff. Even before his brother brought home the family’s first computer in 1991, he collected computer magazines and pictures of computers.

He began working as a computer teacher while finishing up his teaching diploma at American University of Beirut. Ever since his first day on the job, he’s been integrating technology, and he wouldn’t teach any other way, he says.

“Educators fail when students fail,” he says. “In the 21st century, technology is at the heart of education, and technology is dear in the hearts of today’s students. Therefore, we succeed as educators when we bridge the gap by using technology in ways that are meaningful to our students.”

—Diana Fingal is senior editor of L&L
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What do teacher evaluations, a high school orientation program, and digital portfolios highlighting NETS for Administrators have in common? These and dozens of other resources and initiatives were all developed in partnership with ISTE by graduate students in the online Johns Hopkins University (JHU) Graduate Certificate Program in School Administration and Supervision.

The ISTE and JHU partnership offers a 15-month online graduate program that challenges students to think like school leaders as they prepare for the School Leaders Licensure Assessment, an examination for an Administrator II credential. The program not only prepares aspiring educators for school leadership and administrative positions, but also helps current school leaders and administrators learn how to effectively use and achieve NETS•A.

Now in its sixth year, the program provides graduate students opportunities to immerse themselves in learning about, understanding, and mastering NETS•A and the Educational Leadership Constituency Council (ELCC) standards. This is the only resource and partnership to achieve ISTE’s mastery-level Seal of Alignment for NETS•A.

Throughout the year, students work on leadership activities and assignments in six courses, gaining practical, hands-on experience with NETS•A and ELCC standards. As a final requirement of the program, students create a digital portfolio that summarizes their accomplishments and includes artifacts they develop to illustrate how they demonstrate competency in each of the NETS•A. Several students from last year’s cohort developed short videos that showcase NETS•A in action (see Resources for two that Karen Bryer and Mike DiSalvo developed).

At ISTE’s annual conference and exposition, students present a poster session highlighting a NETS•A resource or initiative they developed. Often, these resources come out of a student’s work in the internship course or one of the other five core courses in the program.

For instance, in the Supervision and Professional Development course, students learn about the full clinical cycle of supervision. Students use a variety of observation formats for a series of teacher observations. Seeing an opportunity to move beyond paper observations, former student John Binnert explored how to use iPads and other handheld devices for observations. In his iEvaluation poster session, Binnert showcased how he set up Google and PDF forms to collect observation data. Coming out of the ISTE/JHU program, Binnert armed himself with several practical tools he and other school administrators could use for teacher evaluations.

Jenn Perino and Susie Ciccarelli from Peoria Notre Dame High School took a different approach to developing a practical resource for their school. Recognizing the lack of resources to assist new and current students about to enter high school, they created a time-managed, socially networked orientation resource to help students transition to their new learning environment.

The ISTE/JHU online program connects educators from across the globe to share, learn, inspire, and lead. Applications for the 2012–13 cohort are due April 1.

Resources
iEvaluation: http://ipadteacherevaluation.blogspot.com
JHU program: iste.org/jhu
Karen Bryer’s digital story: www.youtube.com/watch?v=6OQplIZcTKA
Mike DiSalvo’s digital story: www.youtube.com/watch?v=muU1limsYVc
Onboarding Transition Program: https://sites.google.com/a/pndhs.org/pnd-ijourney
When the bandwidth of the computer system at the Riverside County Library System was overloaded with users, Charter Business Fiber Solutions put a rock-solid connection in place.

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—Nicholas Provenzano, English teacher, Michigan, USA

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Catch the excitement of ISTE 2012 via the conference Ning: iste2012.org; Twitter: #iste12; and ISTEConnects.org.