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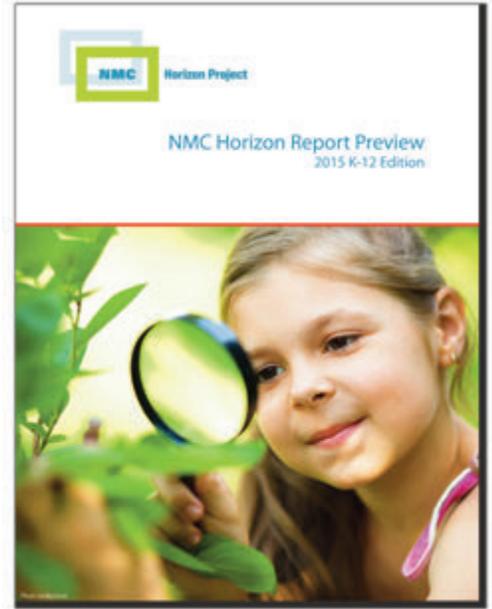
Ed tech's trends to watch

Annual K-12 Horizon Report highlights trends and developments to watch

Stephen Noonoo
Editor, @stephenoonoo

This year, bring your own device programs and makerspaces have their stars on the rise—they could be in 20 percent of classrooms by year's end. And during the next few years, 3D printing, adaptive software, and even wearable technologies in schools could do the same, according to an advanced preview of this year's K-12 Horizon Report, an annual trendsetting look at the current state of technology and learning produced by the New Media Consortium. Each year, the report confers with a panel of education experts and takes

Trends, page 18



Google's free coding clubs

By **Janice Mak**

A few months ago, I was searching for resources to support computer science education for middle school students—girls in particular—when I came across Google CS First. Not really knowing what it was, I went ahead and regis-



Google, page 29

UDL's personal approach

Universal design for learning theory can enable personalized learning

By **David Gordon**

Personalized learning. The term is everywhere these days. And it's tantalizing. It promises to fulfill longstanding ambitions to make education more effective for all. There's nothing new about personalized learning, either as an aspiration or a practice. It's an approach that's as least as old as the one-room school house.

Today, computer-based medical technologies, such as functional magnetic resonance imaging (fMRI), have showed us that learning is far more personal than we ever knew. We now know that even subtle changes in educational contexts, methods, and materials can change how the learning brain performs, for better or worse.

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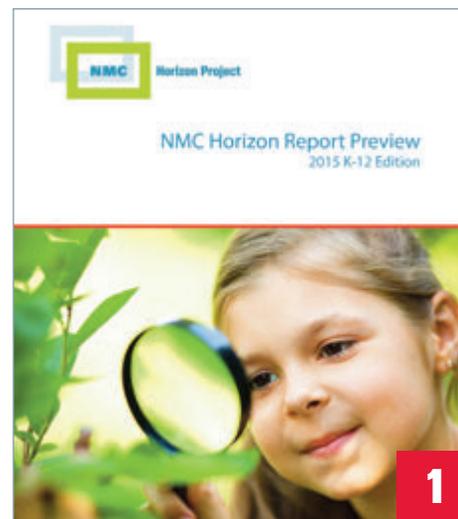
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The 3 trust questions to ask ed-tech vendors

By John Carver

The educational technology procurement market is enormous: \$13 billion is spent annually. Just last year a historic \$2 billion of investment capital was pumped into ed-tech startups. As an educator, how do you know who to trust when it comes to meeting your district's technology needs? Do you trust the established companies fighting ever harder to keep their market share? Can you trust their overpowering marketing machines? Should you trust the new, innovative, and exciting startups? Do they have bandwidth and capacity to keep us online?

These are the questions I ask as superintendent of Howard-Winneshiek Community School District in Iowa. To answer them, I have developed three baseline questions that have been essential in building trust with vendors we work with. They have served my district well through myriad procurement cycles, including a recently launched one-to-one Apple device initiative.

Does the vendor understand our core business?

Our core business in schools is learning. You may be thinking, "Well, that's really obvious John. And next you'll tell me, 'Iowa has corn, too!'" But it's surprising how many educators and vendors forget this. Profits, commissions, and shiny features can be placed squarely ahead of learning. Does this sound harsh? Maybe, but considering it happens more frequently than anyone wants to admit, it is essential this question is asked first and not overlooked.

Whether it is an LMS, professional development provider, hardware or software, we listen to whether vendors truly focus on learning. We establish this early on in our conversations with vendors. "How will this solution positively impact my students and the teachers that support them?" we ask. Trust is built with those that do.

Trust is also built with those that don't toss out a stream of buzzwords



Do vendors get your vision?

hoping something sticks. Does the vendor know and understand things like flipped classrooms, differentiated instruction, STEM, and competence-based education? Lastly, can they articulate how their solution/product enhances/supports these modalities? If you are unable to answer that question about a particular vendor, it might be time to cast a wider net.

Do you have a laser-sharp focus of your district's direction?

We schools need to define our educational direction and priorities first. Then vendors can be engaged. Exclusively relying on vendors to identify our local needs is not productive.

Once defined, trust points are earned with vendors who work laterally to implement change along with us. If you do not know where you are going, valuable resources—money and time—could be wasted relying on a vendor to chart this path for you.

How does this trust look and to whom do we apply it? This trust can be developed from the initial sales call through the final proposal stage from vendors of all stripes and disciplines. From this and our other two questions (core business and pedagogy), we can determine whether we can mesh the vendor's technical solution with our journey of learning transformation.

We are delighted to work with ven-

dors who approach change as a journey, being our technical sherpas when necessary. But as with any journey, creativity can be a necessity to arrive at the destination. We look for this creativity in vendors.

Does the vendor put technology before pedagogy?

Our mantra in Howard-Winn is: Technology should not determine learning; pedagogy should determine learning. After all, pedagogy's Grecian roots mean to "lead a child." Technology is a great delivery vehicle but a terrible leader. Teaching and learning should be driving, while the technology is simply along for the ride.

The vendor's solution must compliment our approach to learning. We don't need to be told-and-sold how we need to change our pedagogy to use their production/solution. That is why having a laser sharp focus is so crucial.

Our focus on pedagogy has made us realize that we can't take a 21st-century tool and place it into a 20th-century structure and expect our students to be Future Ready. We need to have a forward-thinking environment ready, and in place, to best use these tools. Vendors who willingly partner with us on this pedagogy-first journey earn our trust.

Trust runs through our veins in schools. It is something we take seriously. Every day parents and guardians trust us with their children. They want to know their children are safe, nurtured, and that we are doing everything possible to prepare them for the world. This preparation, in part, hinges on the trust we place in vendors. The technical nuances and procurement of hardware, software, cloud services, and data may seem esoteric and far removed. But asking these three questions fosters trust where it really counts—with the students. 

John Carver is superintendent of Howard-Winneshiek Community Schools in Cresco, Iowa.

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Five ways to create a safer digital environment at school

Authors map out blueprint for operating in the information age

By **Bridget McCrea**

In “Securing the Connected Classroom: Technology Planning to Keep Students Safe,” authors Abbie H. Brown, Ph.D., and Tim D. Green, Ph.D., outline a process that education leaders can follow to develop a secure environment for learning with technology. According to Brown and Green, “the book guides educators, administrators, and IT staff through a step-by-step process for creating a district-wide blueprint for keeping students safe while maintaining an appropriate level of security.”

Brown, a professor in the instructional technology program at East Carolina University, and Green, a professor of educational technology and a teacher educator at California State University, Fullerton, both worked in the K-12 environment before moving into higher education. Here, the two authors share tips that school technology administrators can use to make their own jobs easier while supporting their institutions with solid, safe IT practices:

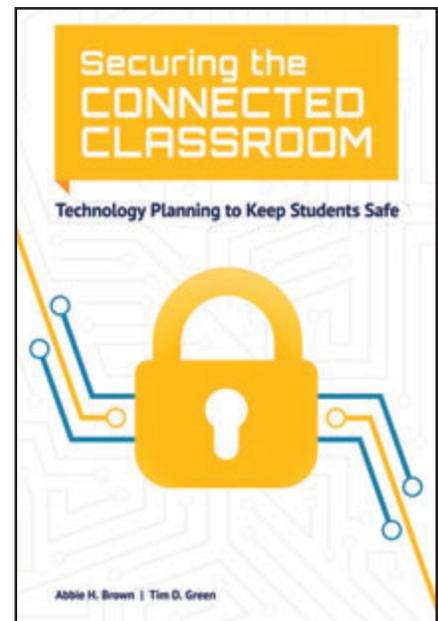
School staff is working toward a common goal, but from differing viewpoints. “When it comes to technology usage and student safety, everyone working with a school comes at the issue from a different angle,” says Brown, who explains that there are administrators, teachers, students, parents, and other constituents to consider when developing good technology usage policies. And while everyone generally has the same common goal of keeping students safe, “everyone also has a different perspective on how that will work—or, what actually poses a threat.”

Understand the link between classroom technology and federal policies. In some cases, individual teachers don’t understand the link between the applications they’re using in the classroom and the various laws meant to keep student data secure. Using ClassDojo as an example, Brown says the application’s ability

to collect data about student progress within a database that’s not controlled by the school is a violation of both the Family Educational Rights and Privacy Act (FERPA) and the Child Online Protection Act (COPA). “As far as we know it’s a benign problem because ClassDojo isn’t intending to do anything with that data,” Brown says. “The software system was just set up to collect the data, and in doing so it’s violating some serious federal policies.” This issue can multiply in environments where budgets are tight and some of the most accessible teaching tools are free apps. “This calls into question exactly how much [freedom] to extend to teachers in making their own decisions about the apps and software that they’re using,” Brown adds.

Vet out applications and tools in a safe setting first. One way IT administrators can help teachers stay compliant with FERPA, COPA, and even the E-Rate funding rule (the latter requires schools to have internet safety policies in place), is by vetting out the tools, applications, and software before handing it over to teachers for classroom use. “I’ve seen a lot of teachers get excited about a particular tool,” says Green, “and then jump right in without reading the user agreement and without talking to other people about their experiences using the technology.” Encourage teachers to talk to your department about that latest, greatest, new application that they read about online, Green advises, and always test out the tool in a safe setting before letting it loose in the classroom. “Try it out for a week and see what happens,” says Green. “If you’re instantly bombarded with advertising, or if the end-user agreement mentions the collection of data, then you could run into problems with it.”

Read through software end-user agreements. This single step helps ensure that teachers and students are working within the confines of FERPA, COPA,



and the various state and local laws governing technology usage in schools. “Read thoroughly into what the product is all about in legal terms,” advises Brown. “Most online software that’s ethical will have a policy statement.” According to Brown, a few years ago Disney was selling software that inadvertently collected data. “They then took it upon themselves to craft a policy statement noting that the data that is collected is not kept and that they’re committed to protecting the students’ privacy,” says Brown. When reviewing end-user agreements, Brown says one of the key points to consider is whether the company has a public policy in place that addresses the maintenance of children’s privacy.

Take a collaborative approach to student safety in the information age. When working with IT administrators, teachers, and parents, Brown and Green like to get everyone together in a room to discuss the problem. They favor the classroom setting for these interactions, and say getting everyone “on one side of the whiteboard” helps the group feel more cohesive. “That sets the tone that we’re all in this together and trying to solve the problem,” says Brown, “versus just having people sitting at a table across from one another.” 

Bridget McCrea is a contributing writer for eSchool News.

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UDL

continued from page 1

At the same time, new technologies have revolutionized how we learn. Portable, personal computers with friendly interfaces, vast computing power, and networked capabilities make it possible to tailor learning to personal interests and needs.

Yet having and using technology in teaching and learning is not enough. Rather, making the most of technology requires a methodical and principled approach, one that turns the aspirations of personalized learning into an effective practice of personalized learning. Universal design for learning (UDL) makes that practice possible. The challenge for educators is to realize this potential in the classroom on Monday morning.

A whole brain approach

Educators and researchers, including my colleagues at the Center for Applied Special Technology (CAST), have rushed to meet the challenge of helping teachers create personalized learning environments by, well, personalizing the learning experience.

CAST's contribution to the field is the development of the UDL framework, which identifies three brain networks related to learning:

- Affective networks that evaluate and set priorities (the “why” of learning);
- Recognition networks that receive and analyze information (the “what” of learning);
- Strategic networks that plan and execute actions (the “how” of learning).

Taking these brain networks into account, UDL recommends the design of flexible, option-rich curriculum that offers learners:

- Multiple means of engagement (affective),
- Multiple representations of content (recognition), and
- Multiple means of action and expression (strategic).

These three principles for personalized learning—a whole brain approach, if you will—recognize that not all individu-

als learn in the same standardized ways.

As any teacher or instructional designer knows, there are four components in designing lessons—goals, assessments, methods, and materials. When designing from a UDL perspective, all of these components are equally important. Any that are poorly designed can thwart personalized learning. Just as the three UDL principles work together to address the brain's learning networks, so too do the curriculum components work together as a system.

Let's look at them more closely and see how Universal Design for Learning can help with embedding personalization in the instructional design process.

Goals

Clear goals tell us what we want to accomplish—in a given lesson, in a unit, in the next year. They are like entering the destination in a GPS system. Where do we want to arrive?

When applying the UDL framework, goals should be decoupled from the means to achieve them so that teachers can effectively plan to provide multiple pathways to success.

How the goal is met should not interfere with achieving the goal of learning that content—just as a GPS doesn't provide only one route to a destination but may offer alternative routes based on variable factors, such as traffic, non-highway options, and so forth.

For example, to teach about the origins of the Civil War, students may be asked to read an article about the Confederate economy and then write an essay about what they've learned. If the goal in this case is not reading and writing per se but rather acquiring and demonstrating knowledge about Civil War's origins, then the goal should not prescribe the means—reading and writing. Rather it should offer learners multiple ways of accessing information and expressing what they know.

K-12 instructional goals are usually tied to standards, which articulate a baseline of knowledge and skills that the community values. But well-designed standards also leave room for educators to shape classroom goals and

to personalize the means for achieving them. Not everyone will arrive at a common goal in the same way. Nor would we want them to. Experts in any field certainly don't all take the same path to success.

Tips for universally designing goals:

- Emphasize the outcomes, not the means and methods of achieving them, when you set instructional goals.
- Create instructional objectives that are concrete, specific, and measurable steps but that are also flexible enough to allow adjustments along the way to accommodate the needs of all learners.

Methods

Once the goal is clear—and does not conflate aims with means—educators can apply the UDL principles to providing appropriate instructional methods.

Blended learning facilitated by new technologies can help break through traditional barriers to engagement and expression. Students who are reluctant to speak up in face-to-face settings or collaborate with peers may become contributors in an online environment.

Offering peer-to-peer support may give learners opportunities to reinforce their knowledge by teaching others, while those who are mentored benefit from individualized coaching. In other instances, educators may exempt some learners from group settings, giving them time to work alone.

In the same way that a GPS device might suggest an alternate route based on traffic, flexible methods in the classroom can provide varied and personalized approaches for achieving common standards.

Tips for universally designing instructional methods:

- Encourage student motivation and persistence by helping learners relate the lesson to their own priorities and concerns. Think about varied and flexible ways to prompt students to relate the lesson to their real-life concerns.
- Choose wrap-up activities that provide students with varied opportunities to summarize what they learned, reinforce new learning, review key concepts, and discuss next steps.

Materials

eSchool News readers know better than most that digital media provide many opportunities for teachers to reach and engage learners. And learners in the post-print age have direct access to materials that previously were dispensed through textbooks or through teachers.

Learners now have access to high-quality audio and video, 3D animations, digital graphic organizers and glossaries, instant links to background information and source material, and just-in-time supports such as text-to-speech.

Teachers and students can now create their own digital books, videos, audio, and other materials easily and cheaply, too. (At CAST, we provide free tools to accomplish much of this. See www.cast.org/learningtools for more details.)

Providing materials that offer multiple means of engagement, action and expression, and representation are all much more possible today. Many off-the-shelf digital materials are loaded with the sort of flexible and customizable features that universal design for learning is known for.

But digital doesn't always mean flexible, accessible, and/or effective. In selecting digital options, educators can use the UDL Guidelines as a means to assess how well designed a product or an online environment really is.

Tips for applying UDL to instructional materials:

- Look for materials that are engaging and that have the flexibility to give learners multiple avenues of access. In digital environments, look for text-to-speech and synchronized highlighting options to enhance text.
- Consider materials that offer embedded glossaries, translation supports, and other just-in-time comprehension aids, which will also improve comprehension for English language learners.

Assessment

The literature on UDL clearly leans toward well-crafted formative assessments, the kind employed during instruc-

tion to gauge a learner's progress. They may be formal (as in quizzes) or informal ("how are you doing?").

Well-designed formative assessments give teachers a concrete, visible means of getting the data they need to inform their instructional decision-making. They might help a teacher adjust instructional methods, choose different materials, coach students in next steps, or identify patterns in learning that are unproductive. Educators who monitor progress this way are rarely surprised by student performance at the end of unit or school year.

Summative assessments—those tests given at the end of a unit or a year—also have value, though they reveal less about student performance than they do about the performance of the curriculum itself.

For both formative and summative assessments, the UDL principles still apply. Assessments should be flexible in how the content is conveyed, in the ways students can take them, and they should encourage student engagement and persistence.

For example, using the same kind of assessment all the time can be misleading, as it might just conflate test-taking ability with genuine and deep knowledge. By giving learners many ways to show what they know—and by building the skills of self-reflection and self-regulation—well-designed assessments can be powerful tools for lifelong and personalized learning. Some tips for applying UDL to assessment:

- Use formative assessments to gauge students' levels of engagement. Adjust methods and materials accordingly. Use results to inform your instruction and give feedback.
- Use flexible summative assessments to get an accurate picture of student skills and understanding as well as the effectiveness of the curriculum. 

David Gordon is an award-winning education journalist and director of publishing and communications at CAST.



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How a collaborative mindset helps teachers reach all learners

Special-ed and general-ed teachers work together at one district to improve outcomes

By Christine Fax-Huckaby

The implementation of the Common Core State Standards has been met with anxiety from administrators and educators at every level, because, like any major change, it can seem scary and overwhelming. General education teachers have had to learn and apply new instructional strategies to address the new standards and the vision that the standards embody, particularly a universal design for learning (UDL). Special education teachers have been required for the first time to become pseudo subject-area experts to help struggling students and those with learning disabilities meet the standards.

students through a framework known as universal design for learning, which provides something of a blueprint for creating learning goals and materials that work for all learners. We accomplish this through carefully-designed cohorts, teacher-led zones, online resources support, and by fostering a collaborative culture.

Paving the way for change

Cultivating the right mindset is of the utmost importance before any change can result in positive outcomes. The type of mindset a district strives to develop is dependent on its goals. At Sweetwater Union, we aim to create a

career readiness goals, we must view them as everyone's responsibility.

Cohorts and Professional Learning Communities are led by teachers, and special-education resource teachers provide ongoing support to all cohorts. This enables teachers to rely on each other for help. When they have this kind of safety net, educators are more willing to try new strategies and tools and share their findings with others. The mindset that I share with our teachers is that it's all—Common Core, UDL—a work in progress. It's new to us all, and we are all learners together.

Zones enable educators to learn together

Our district has established zones in which subject-area teachers and general education teachers work together to develop and evaluate lessons that address multiple modalities. Teachers volunteer to be site leads for schools to develop sample lessons and model UDL approaches. Site leads meet with subject-area experts and special education resource teachers across all schools in zone meetings for each subject. Educators in these zones are able to get their hands dirty, test, and explore best practices before they try them in the classroom. The goal is to give teachers the tools they need to enable students to demonstrate subject-area mastery in various ways.

During zone meetings, the department site leads share what they've learned in their cohorts with the departments in their assigned zones. We have seen a dramatic increase in turnout for these sessions, because the content is more helpful and relevant to the teachers. By tapping into everyone's expertise and sharing it with others in zones, the district is able to leverage the great minds they already have and establish a support network.



Universal design for learning can help foster a supportive environment.

This can be a stressful time for everyone. However, when educators are empowered to share their expertise with one another, and given the time and place they need to collaborate, they surpass expectations and their students soar.

At Sweetwater Union High School District, located near San Diego, we bring general and special education teachers together to meet the needs of

supportive culture in which educators feel comfortable enough with their peers to share their thoughts and insights and to take risks.

When our district brings together general and special-education teachers, we reframe the conversation to focus on “our” students. It’s no longer about your kids or my kids. Every student is impacted by a universal design for learning, and to achieve college and

Continuous growth

In addition to the cohorts and zones, our district pairs general and special education teachers together in collaborative and co-teaching models to support UDL- and Common Core-aligned learning goals.

In our collaborative model, many of our students who need additional supports stay in mainstream classrooms and receive individualized support through lessons designed to address their learning styles and needs. A special education teacher works with several general education teachers in and out of the classroom to ensure all students are progressing. For core subjects of math and English, the district uses a co-teaching model. A special education teacher is paired with one general-education teacher and is in the classroom 100 percent of the time.

To ensure support is provided on an ongoing basis, technology plays a critical role in providing resources that are

At Sweetwater Union, we aim to create a supportive culture in which educators feel comfortable enough with their peers to share their thoughts and insights and to take risks.

available 24/7 and accessible to students with varying abilities and skill levels. The district uses an LMS (Learning Management System) in order to share resources. UDL lessons and resources are curated by teachers and posted in the system for anyone to use. The district also employs a variety of apps and software, such as Gizmos, Achieve 3000, and will be using Math180 to reach students through

auditory, kinesthetic, and visual learning and demonstrate mastery in ways that make sense to them. For example, Learning Upgrade, an online math and reading curriculum, uses catchy songs and fun games with text to address Common Core standards in a relatable way.

The district's collaborative culture and teaching approach further enables educators to adapt to new technologies. We encourage teachers who are reticent to try one thing first, whether it be an instructional strategy or an app, and master it before moving on to the next in order to build their confidence and comfort level. As the district expands its one-to-one program beyond the middle school grades, this mindset will become ever more important. **eSN**

Christine Fax-Huckaby is a special education academic support teacher (SEAST) in the Sweetwater Union High School District in California.

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When students become entrepreneurs, real learning happens

Some students get engaged with cross-curricular, large-scale project-based learning

By Jason Braddock

Here in eastern Ohio, some of our students are embracing their entrepreneurial spirit right at school, engaging in a style of learning that helps make lessons come alive.

The students, spread throughout nine districts, are working with my organization, the Mahoning County Educational Service Center, which provides educational opportunities—including this foray into project-based (PBL)—thousands of regional students.

In one recent project, student teams were assigned a region of the United States, and they were challenged to plan and design a self-sustaining restaurant in that area. Nearly every subject was involved as students researched the demographics of their region to determine what kind of restaurant would make sense for their customer base, and identified the renewable energy sources they could use to cut costs and reduce the carbon footprint of their restaurant. Teachers in almost every subject gave up part of their class time to let students work on their projects. In math, they calculated the optimum prices to charge for dishes. In English class, they had to develop a pitch to investors. And in music, they wrote an advertising jingle to promote it.

Designing authentic, performance-based tasks like this can be challenging. But the teachers in these nine pilot districts are getting help from an online service called Defined STEM, which offers project-based curriculum for students in elementary through high school, based on real-world problems or scenarios within the context of an actual career or industry.

Last spring, our organization received a state grant intended to help schools transition to digital curriculum. We used these funds to purchase subscriptions to Defined STEM for nine of the 20 districts we serve.

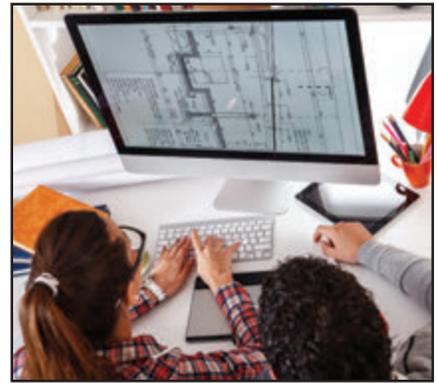
Defined STEM's performance tasks are built from the UBD (understanding by design) framework and are introduced with videos of STEM professionals discussing the projects, which allows students to see the performance tasks through the lens of a real career. Each task results in anywhere from five to eight culminating products or activities, all of which address a different cross-curricular topic.

Each performance task also includes clearly defined rubrics for assessing the various products. The projects are designed so they can be modified easily by teachers using something called a Performance Task Editor—basically a tool that lets teachers edit a task, remove or add products, or upload other relevant information.

In another cross-curricular project, students watch a video about Dubai's Palm Islands, two artificial islands created as resort properties. Working in groups, the students then assume the role of developers planning their own artificial island resort. They must calculate the volume of sand and rock they'll need to build their island, research the potential environmental impact of their project, develop a marketing plan, and so on.

Moving to a project-based model of instruction represents a big change for educators. At first, some teachers were reluctant to give up the control they were used to having and shift this over to their students. But once they started with a project, and they saw how engaged their students were, they quickly realized the value of this approach.

One teacher told me that her students learned more in one project-based unit than from anything else she had taught all year. Students are likely to remember this information longer as well, because they have internalized the knowledge by



Some students learn better with PBL.

applying it within an authentic context.

Using Defined STEM has made it easy for teachers in the nine pilot districts to integrate project-based learning into their curriculum. We're only in the first year of a two-year pilot, so it's too early to make any judgments about the initiative—but we're confident that our student achievement data will show the program has been a success.

In fact, we plan to open a STEM-focused school with a fully project-based curriculum for the 2016-'17 school year. Located on the campus of Youngstown State University, the school will be open to students from all across the state.

I absolutely believe that students retain the information better when they learn through a project-based approach as opposed to direct instruction, because it involves them and gets them engaged. That's what we tend to remember the most from school: those fun projects that made us think—and not necessarily the day-to-day instruction.

What's more, students are learning about a wide range of potential careers before they get to college. This approach expands students' horizons and exposes them to new possibilities, inspiring them to pursue careers they might never have considered before.

eSN

Jason Braddock is the instructional supervisor for secondary mathematics and STEM education for the Mahoning County Educational Service Center in eastern Ohio.



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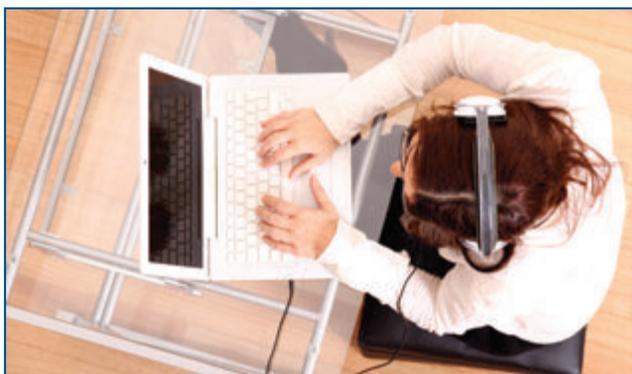
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Michigan Virtual School expands students' access to world language instruction with help from Middlebury Interactive Languages

Online curriculum offers rigorous preparation for Advanced Placement tests

As a growing number of K-12 students explore specialized learning opportunities online, the Michigan Virtual School (MVS) is using a comprehensive online curriculum from Middlebury Interactive Languages to expand students' access to world language instruction—including rigorous Advanced Placement (AP) courses that can result in college credit.

"More than any other curriculum that I've seen online, the Middlebury Interactive courses really seem to be created by people who understand language learning," said



"More than any other curriculum that I've seen online, the Middlebury Interactive courses really seem to be created by people who understand language learning."

—William Springer, Lead World Language Instructor, Michigan Virtual School

William Springer, lead world language instructor with MVS. And that has led to a remarkable pass rate on AP exams, Springer added.

A division of Michigan Virtual University, MVS delivers supplemental online courses to middle and high school students, including American Sign Language, Latin, Japanese, Chinese, French, German, and Spanish. The online school uses Middlebury Interactive to provide the content for the latter three languages, including AP French and Spanish.

The online curriculum from Middlebury Interactive is based on methodology from Middlebury College's renowned Language Schools. The quality of the media in

these courses helps students immerse themselves in language-oriented experiences.

"The Middlebury Interactive courses use a lot of authentic resources, such as video from the target culture," Springer said. He added that the use of native speakers and materials helps students experience cultural nuances.

When students hear native speakers speaking, often at full speed, it "very much prepares them to function in the target culture—more than hearing an American speak that language," he said. "Any world language instructor who is at all researched or learned in the field would appreciate that."

Those cultural nuances are important for AP students who hope to earn college credit by scoring well on AP exams at the end of the school year.

"Listening and writing comprehension is very, very important at the AP level," Springer said. "The Middlebury Interactive AP language courses constantly provide authentic input from websites, podcasts, videos, and TV shows from the French- or Spanish-speaking world that students have to understand."

Springer credits the curriculum's rigor and authenticity for a remarkable pass rate on the AP exams—including a 100-percent success rate for the last two years in AP French.

"That speaks to us that the curriculum and the instruction we're providing are really preparing students well for the AP exams," he said.

Aside from the opportunity to earn college credit, students enroll in online world language courses to access opportunities not offered in their schools, to learn a language spoken by family members, or to manage scheduling conflicts, Springer said.

"Some students are 'heritage learners.' They might have family ties to that language and culture, and they want to be able to speak it," he explained. "We're providing them with an opportunity they might not have at their own school."

The Middlebury Interactive Languages curriculum "tends to be more rigorous than any other curriculum out there," Springer concluded. "The amount of content students are covering is much more advanced and goes much more in-depth in terms of the amount of language learned per year than anything else. For the students who are up for a challenge and are really serious, they tend to thrive and do really well!"

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- Utilize a project-based approach that favors multicultural perspectives.
- Focus on academic English, including reading, writing, listening and speaking skills, as well as vocabulary building.
- Align with Common Core and WIDA standards.



How schools can keep students safe and on Facebook

By Sanjay Ramnath

Today, educators are implementing exciting technological advances in teaching and learning. E-learning and a broadening acceptance of social media, online collaboration, and other forms of technological engagement are shaping how we view education and what it will look like going forward. However, this paradigm shift also opens a Pandora's box of threats that require administrators to rethink IT strategies and solutions.

In addition to complying with regulations such as the Children's Internet Protection Act (CIPA), K-12 administrators have to deal with concerns like cyberbullying, cyberstalking, and students accessing inappropriate video content on a host of devices—a problem made more challenging by the increasing adoption of mobile devices on school networks through one-to-one initiatives and bring your own device (BYOD) policies. K-12 administrators have to consider ways to extend their network security policies to these devices as well.

As K-12 organizations embrace a more mobile environment, security necessarily becomes a top priority in keeping students and networks safe, while providing access to educational tools and resources online.

A comprehensive web security solution combined with a Mobile Device Management (MDM) service can help address some of these concerns.

Allow, but monitor

Social-networking sites have become integral assets for providing a diverse, collaborative e-learning experience, and schools should be able to allow classroom access on their networks, while keeping an eye on activity. Facebook can be a great tool for collaboration amongst students. However, it can also become a place to bully other classmates with rude posts, comments, pictures. Similarly, online videos can be a powerful educa-



JuliusKielaitis / Shutterstock.com

Web filters can help schools regulate Facebook activity.

tional tool in the classroom if regulated properly. YouTube, for example, has its education arm, YouTube for Schools, which can be a great way to provide students with access to content that is educational, without allowing them to search for inappropriate content.

Finding a web filter solution that can provide the ability to regulate YouTube and Facebook, but also tools like Twitter and Skype is crucial. A good web filter can give administrators the ability to set policies allowing students to access Facebook, while blocking Facebook's email, chat, and games. Administrators can even get more granular and set trigger alerts when cyberbullying is detected on, say, Facebook comments—allowing basic access, while restricting nonproductive activities and applications. Safe search enforcement for search engines and restricted access to video sites like YouTube can block inappropriate content. And administrative overhead can be reduced by workflows and delegated controls for teachers to regulate the type of content accessed in the classroom.

These policies should also extend to mobile devices that K-12 administrators are required to manage. A major concern when providing mobile devices to students is what happens outside of the network. An MDM solution can remotely enroll, configure, secure, and monitor mobile devices so they are safe, whether they are on the school network or outside of it.

For example, devices provided by

schools can be configured to prevent installing unauthorized applications. Settings can also be configured to ensure that web traffic is subject to the school's internet usage policies and enforced through a web filter, even when the devices are outside the school network. They can also be remotely locked and wiped in case of loss or theft. Student-owned devices can also be enrolled, monitored, and provided the right level of secure access to wireless networks and other resources on the school network. The MDM solution can be used to automatically install, manage, and remove applications provisioned by the school on these mobile devices. A good MDM solution should provide simple deployment and enrollment, support the latest mobile devices and operating systems on the market, and scale to handle distributed school networks.

Although maintaining student safety in today's ever-changing threat environment sounds like a daunting task, you don't have to go it alone. Together, a web security solution combined with an MDM enables students to benefit from the positive aspects of e-learning, while minimizing risks. It's a powerful, effective strategy for K-12 institutions to successfully control, manage, and stay ahead of online predators and inappropriate activity. 

Sanjay Ramnath is the senior director, security products, at Barracuda Networks.

Five steps to a custom makerspace

Start your makerspace on the right foot with these steps

By Laura Flemming

A couple of years ago, my son won an award in preschool for being “Eager to Learn.” I remember having such mixed emotions on the day he won the award. Of course I was beyond proud of him, but I also could not help but wonder if his schooling would allow him to carry and sustain that innate zeal for learning with him as he came to face the rigors of the Common Core and standardized testing.

It was about this time that I began my job as media specialist at New Milford High School, and my own worries about my son, combined with New Milford’s desire to reinvigorate their school library, made me more passionate than ever about forging schools that work for kids.

I believe that every child has the right to invent, tinker, create, innovate, make, and do. The maker movement has created opportunities for all educators to give students authentic learning opportunities that go beyond the typical classroom experiences and to rethink traditional learning environments to include those that nurture the kinds of creativity and innovation that will benefit our students both in school and beyond. We know children learn by exploring and playing and doing and making and that these kinds of things lead to deeper engagement. The maker movement embodies opportunities for experimentation and innovation to occur across all grade levels and all content areas.

Physical makerspaces have allowed us the opportunity to pull some of this excitement of the maker movement into our schools. Makerspaces can help set the stage for meaningful student learning, as well as help cultivate a culture of innovation within a school. My makerspace inspires innovation, passion, and personal motivation and interests, and has encouraged students to pursue STEM subjects and careers.

When schools talk about the maker movement and creating makerspaces,

they often focus on purchasing the tools and materials first. While a physical room stocked with tools is an important part of the process, even more significant is the process used to plan your space. Paying close attention to how you design and formulate your space within the very specific context of your own school and its community will ensure that the resulting space is authentic and meaningful to the whole school community.

The following approach to planning will help ensure that your makerspace is a vibrant and thriving one.

Step One: Understand your learners.

Start with the learners! Find out what they want to do. In developing my makerspace, I spent a lot of time just talking to my students in order to get a strong understanding of their needs, wants, and interests. Take time to find out what they are doing in their classes, at home, or in afterschool and weekend activities.

Step Two: Assess existing curricula, programs, offerings within your school community.

Makerspaces can be great opportunities both to fill in gaps in what your school offers and to democratize concepts that are too often taught to only select students within school. The aim is to render these concepts accessible to all students, regardless of their proficiency level, social status, or even levels of language development. As an example, my makerspace has extricated a number of mostly STEM-related themes from their usual classroom focus—subjects that only a small segment of our student population would normally experience (such as robotics), and at the same time it has brought in concepts that are new to the school and new to our students (such as computer coding).

Step Three: Consider global trends and best practices.

Through Twitter (via the #tlchat hashtag and others), I feel like I do have a finger on the pulse of education



3D printers have multiple uses.

throughout the world. I am forever paying attention to global technology trends that are shaping our world and look at our makerspace as an opportunity to expose our students to some of those things.

Step Four: Develop themes.

While makerspaces are most often associated with STEM-related concepts and technology-based activities, they don’t have to be. The key is to develop authentic themes, across the curriculum that will have purpose and value for your learners. Some of the themes for my makerspace include robotics, 3D printing, and wearable technology.

Step Five: Order equipment and materials.

Rather than ordering a makerspace-in-a-box type of kit, it is best to order equipment and materials that authentically reflect the themes you have developed for your space. Some of the materials I have ordered include Legos, Arduino boards, and Raspberry Pis.

Makerspaces should be seen as a metaphor for unique learning environments that encourage tinkering, play, and open-ended exploration for all. Purposeful planning will allow your makerspace to insinuate itself into the mindset of students, educators, and families within your school. 

Laura Fleming is a media specialist at New Milford High School in New Jersey. This article was adapted from her new book “Worlds of Making: Best Practices for Establishing a Makerspace for Your School.”

Trends

continued from page 1

a close look at the trends, challenges, and underlying developments driving today's education technology adoption and implementation.

The final product whittles dozens of emerging and established ed-tech topics into just 18, arranged by category—the trends, challenges, and developments referenced above—and time to adoption (or, in the case of challenges, complexity of the problem and how close we are to solving it).

Now trending

The report's list of trends serves as something of a snapshot of the current state of education technology adoption in schools. But it's not all plucking out the hottest buzzwords—there's a methodology behind it, according to Larry Johnson, chief executive officer of NMC. "Our approach looks at when a trend will have its maximum impact in schools, and the degree of that impact," he said. "Will it 'flame out' in a year or two (e.g. Second Life)? Or will it persist (like mobile) for years, and continuously surprise us with its growing utility and capability?"

As far as driving education-technology adoption over the long term, the report singles out two movements: First, the shift to deeper learning approaches, perhaps best typified by the move to putting greater emphasis on project-, inquiry-, and challenge-based learning; and second, the rethinking of how schools work, away from traditional bell schedules and siloed subject instruction. Instead, schools are starting to turn toward multidisciplinary approaches that are, according to the report preview, leading "some teachers and administrators [to] believe that schedules should be more flexible to allow opportunities for authentic learning to take place and ample room for independent study."

During the next three to five years, collaborative learning approaches, affecting the way both teachers and students learn, and a shift from "students as consumers to creators" could be con-

sidered drivers of technology for schools. Of the latter, the report points to "the growth of user-generated videos, maker communities, and crowd-funded projects" increasingly becoming the means for active, hands-on learning.

And in the short term, over the next year or two, the rise of STEAM learning (science, technology, engineering, and mathematics, plus the arts) is impacting technology adoption, especially, according to the report, "as there is more multi- and cross-disciplinary learning taking place at schools, revealing how these seemingly disparate subjects are interconnected." Similarly, blended learning is noted to be "on the rise," even after accounting for the "burnout of massive open online courses (MOOCs)," thanks to "progress in learning analytics; adaptive learning; and a combination of cutting-edge asynchronous and synchronous tools."

In development

The bread and butter of the report, however, is the popular list of "Important Developments," which predict which technologies could reach mainstream status—a place in 20 percent of classrooms. Compared with the report's list of trends, which focus on the conversations and needs of schools that lead to technology purchases, the developments section "is much more influenced by what is happening in the world around schools," Johnson says.

And as ed-tech movements enter the mainstream, or else stagnate, they naturally drop off. This year, the report pegs makerspaces and BYOD as the two most likely to enter mainstream in the next year. The latter is a holdover from last year described as having the potential to save districts money while mirroring the contemporary shift to using personal devices in college and career settings. Makerspaces, a term virtually absent from last year's report, "came on the radar due to grassroots support from a passionate community," according to the preview.

In a similar vein, 3D printing could enter mainstream in just two or three years, buoyed by both falling prices and the rise of makerspaces. Adapted learning

technologies, which "refer to software and online platforms that adjust to individual students' needs as they learn," are given the same prognosis. "In schools," the report notes, "many teachers envision these adaptive platforms as new, patient tutors that can provide personalized instruction on a large scale."

Farther out, badges and microcredit—a movement somewhat linked to gamification—could gain momentum over the next five years, although its adoption to the mainstream has stalled in the past as companies and efforts come and go. Despite the fizzle of Google Glass, the report notes wearable technology—think education-focused uses for Oculus Rift or even the Apple Watch—could see wide adoption in the same time frame as price points, technology advances, and new learning applications put it within reach for more and more schools.

Under the radar

The report isn't necessarily the final word on education development and trends, and the NMC's panelists frequently make tough choices in narrowing down their list. This year, Johnson said, trends such as redesigning learning spaces and an increasing focus on the measurement of learning were in the running up until the final vote. On the development side, cloud computing, learning analytics, and visual data analysis came close to making the cut.

Other efforts, even those that have appeared in past reports, were dropped altogether. Gaming, Johnson said, is a good representative example: "We retired games and gamification this year, as we do not see it entering the mainstream any time soon, despite the broad interest in the topic and the evidence of its efficacy," he said. "It is just out of reach for most people, and the developments most experts thought were coming that might make it easier have not materialized yet. If that changes, it could come back." 



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Seven 3D printers for the classroom

A snapshot of classroom-ready 3D printers available for educators

By **Rebecca Lundberg**

These days, 3D printing is becoming a staple of the modern classroom, from K-12 to college and university campuses as well.

Even as prices dip for some models, educational institutions and districts are also gaining financial support from outside sources for ventures into 3D printing. In fact, government business intelligence company Onvia reports that from 2011 to 2015, more than \$1.8 million in 3D printer and supply contracts was awarded to 44 primary, secondary, and higher education institutions and school districts across the United States.

David D. Thornburg, co-author of “The Invent to Learn Guide to 3D Printing in the Classroom,” said he would not recommend one specific 3D printer for classroom use because the constant advancement in the 3D printing industry can make choosing the best models a “moving target.”

Thornburg said 3D printing is headed in the direction of being “another piece of technology that’s just going to be there,” both in the classroom and even in media such as students’ smartphones (where they might access modelling software, for instance, or queue up printing projects from mobile browsers).

Thornburg said playing a game like Tic-Tac-Toe, which can become mundane after a few minutes, is transformed to a problem-solving tool in 3D form.

“Suddenly, the strategy for winning changes,” Thornburg said, as students can play with stackable pieces instead of a simple flat surface with pencil and paper.

Matt Widaman, a career and technology education instructor for the Kenai Peninsula Borough School District in Kenai, Alaska, uses a Dimension Stratasys 1200 ES to help create CO2 cars in his drafting courses. Widaman said 3D printing the cars, which run 60-65 miles per hour, has been a great addition for the students in teaching them

STEM lessons.

We recently rounded up seven 3D printers on the market, including Widaman’s Stratasys, targeted toward educators and students, from big to small, pricey to affordable.



1. Dimension 1200es

(Retail: \$34,900)

Footprint: 326 pounds,
33 x 29 x 45 inches

This Stratasys printer’s durability and quick removal make it well suited for a classroom environment. The product’s large size allows it to print larger models.

2. NVPro

(Education: \$4,999 annually;

Retail: \$9,999 annually)

Footprint: 70 pounds, 20.8 x 22 x 31 inches

The NVPro is a pioneer of the completely-automated printer. This cloud-based printer from company NVBots can connect to devices via browsers—such as tablets and smartphones. In lieu of the software that typically comes with 3D printers, users can log into a website and print from there. A curriculum library is also available.

3. MarkerBot Replicator Z18

(Retail: \$6,499)

Footprint: 90 pounds, 19.4 x 22.2 x 33.9 inches

The company’s fifth-generation printer, the Replicator Z18, is cloud-enabled and can connect to devices via Wi-Fi, USB, and Ethernet. This product is designed for creating prototypes for class demonstrations.

4. Leapfrog Creatr

(Education: €1,899.00, approximately \$2,053.55; Retail starter: €1,999, approximately \$2,161.69)

Footprint: 70.55 pounds, 23.6 x 19.7 x 23.6 inches

The company claims quick set-up and printing speeds. The desktop printer features laser-cut, all-aluminum parts built to withstand temperature changes.

5. Afinia H480 (Retail: \$1,299)

Footprint: About 11 pounds, 9.64 x 10.23 x 13.78 inches

Known for its simple, “just hit print” capabilities, the Afinia H480 is a lightweight desktop printer that supports classroom visualizations and prototypes. Complimentary lifetime tech support is available.

6. AirWolf A3D HDL

(Retail: \$2,295)

Footprint: 40 pounds, 24 x 18 x 18 inches

As a user’s needs and budget grow, this printer’s modular design allows for upgraded capabilities, such as filaments.

7. Project 260C (Retail: \$39,520)

Footprint: 437 pounds, 29 x 31 x 55 inches

This full-color printer from Aniwaa creates high temperature resistance models suited for a constantly changing classroom environment. Users can print multiple models at the same time in just hours. 

Rebecca Lundberg is an editorial intern for eSchool Media.

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This district lets students choose how to learn

A district offers students six instructional models—which has led to zero dropouts

By Dennis Pierce

To hear Taylor County Schools Assistant Superintendent Charles Higdon tell it, students shouldn't be allowed to drop out of school—at least not without a fight.

“We have implemented a ‘zero dropout’ policy that does not allow students to drop out of our district,” he said. But rather than imprisoning stu-

Association’s annual conference last month, Higdon and Superintendent Roger Cook—whose vision is behind the district’s innovative approach—described how Taylor County gives students a wide choice in how they want to learn.

“Instead of saying, ‘This is how our district is going to be,’ we actually allow multiple approaches,” Higdon said in an

This approach has proven successful for at-risk students in particular.

“The reason many students are ‘at risk’ to begin with is they have a hard time sitting at a desk for six hours a day, 176 days a year,” Higdon said. “They’re just not successful in that setting.”

But in a virtual setting, these at-risk students are able to work at their own pace; they can listen to music if they need to, or take a walk to clear their mind—and “we find that many can actually complete the required work faster,” Higdon said. “They feel like they’re in control of their own education, and they’re able to get out into the workforce quicker, which many of them want to do. This opens up the door for at-risk students in a way that most schools don’t offer.”

Project-based learning. In these classrooms, units are set up based on real-life projects. Students learn the content as they work through these projects.

“We also offer several mentorships and real-life experiences for our students through school-based enterprises,” Higdon said. “For example, in our high school, we have a student-run bank. We have a school gift shop and a culinary arts catering service run by students. We have a business called tBay, which is our version of eBay, where students sell goods online for the public—and they earn a percentage. We have a graphics design and T-shirt printing shop, an aviation course where students can earn their pilot’s license, and a greenhouse run by agricultural students.”

He added: “We teach students the content, but we also develop strategies for them to apply this knowledge within a real-world setting. And if we don’t offer a particular scenario within our district, we let students step outside our doors to find that experience within the community.”

Peer-led classrooms. In these classrooms, the teacher is a facilitator, and the students act as instructors. Students



Peer-led classrooms is one new model at Taylor County Schools.

dents in front-facing classrooms, the rural Kentucky district is instead trying to entice at-risk, and even low-risk, students to enjoy their education through a series of innovative and distinct learning pathways—informally called “spokes.”

Students in Taylor County can actually choose how they want to learn from among six instructional models, including traditional, online, peer-led, and project-based learning. This highly student-centered approach has resulted in a 100-percent graduation rate within the district during the last few years, say administrators.

“We build a team around each child in the district, and we find out what their goals are—and the team helps guide them there,” Higdon said.

During the National School Boards

interview.

One of these is a traditional approach to learning, in which students come to class each day and receive direct instruction from a teacher. “Some students and teachers still prefer this approach,” he explained.

But Taylor County also offers five alternative approaches for students who want something different. These are:

Virtual learning. Students can learn online at their own pace, typically moving through curriculum from online course provider Odysseyware. They can move at a traditional pace or work ahead and graduate early. “We’ve created a Virtual Academy in which students log into their online classes from a computer lab under the guidance of a fully certified instructor who acts as an on-site guide,” Higdon said.

who have mastered the content first help other students learn the content. “Some students learn better from their peers than from a teacher,” Higdon explained.

Taylor County also has a program called STARS, which stands for Students Teaching and Reaching Students. Students can apply to become a STARS mentor, and about 250 students have done this.

“These STARS students are placed with an elementary teacher and act as an instructor under the official certified teacher,” he said. “Approximately 40 per cent are bused to our elementary and middle schools, and some of those have decided they want to become teachers some day—so it’s perfect training for them, but it also gives another set of eyes and hands to the elementary teachers.”

Self-paced classrooms. Here, teachers record their lessons, and students are able to watch these videos either during school or outside of school, as often as they need to learn the material. “The teacher facilitates and works out problems during the class time with students,” Higdon said.

Cardinal Academy. In this program, launched just this year, students develop their own learning plan and schedule under the guidance of an academic adviser. They decide for themselves what subjects they will work on, when, and for how long. They can also learn off campus through internships if they want.

“The students are in control of what they do each day,” Higdon said. “There is a rigorous application process they need to go through to participate, and they have to be considered ‘proficient’ or ‘distinguished’ under the state’s accountability system to apply. The students love this approach, because they feel empowered.”

Enabling Taylor County’s unique approach is a one-to-one computing program in which all students in grades three and up have access to iPads or Lenovo laptops. But giving students a choice in how they will learn poses some logistical challenges for the district.

“We’ve been doing this for six years now,” Higdon said of his personalized

approach. “When we first started in year one, it wasn’t as smooth a system throughout the district as it is now. We had a lot more challenges at the beginning than we do now.”

Taylor County administrators and guidance counselors collaborate with support staff to develop a master schedule.

“We take the students’ needs and preferences into consideration when we build the plan, and then we create a master

schedule around these,” he said. “The process has evolved over the last few years, and everyone now accepts it.” **ESN**

The former editor in chief of eSchool News, Dennis Pierce is now a freelance writer covering education and technology. He has been following the ed-tech space for more than 17 years. Dennis can be reached at denniswpierce@gmail.com.



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How technology can support positive behavior in schools

How technology can help you apply Positive Behavioral Interventions and Supports (PBIS) in your schools

By Karen Gifford

According to the federal Education Department, more than 19,000 U.S. schools are using School-Wide Positive Behavioral Interventions and Supports (PBIS), an evidence-based framework to reduce disciplinary infractions, improve the school climate, and increase student achievement.

Similar to Response to Intervention (RTI), PBIS takes a three-tiered approach to instilling positive behavior in schools. Tier 1 focuses on interventions used on a school-wide basis for all students, such as actively teaching and reinforcing appropriate behaviors. Tier 2 applies more targeted approaches to students who need additional support, while the third tier is for students who have significant behavioral problems and may require an individual behavior plan and perhaps wraparound services.

In Arizona, I've helped create an event called the Behavior, Education, Technology Conference (BET-C), which explores how technology can help with PBIS. We just held the fourth annual BET-C in early March.

Based on the sessions from this year's conference, here are three ways technology can support the implementation of PBIS in schools.

Better data use

PBIS relies on using data to identify the behavioral needs within a school, so you can focus your efforts and resources where they will have the greatest impact. This is one key area where technology can help significantly.

Using a data collection and analysis tool enables you to identify the students who have the highest number of disciplinary incidents, for example, so you can plan more specific Tier 2 or Tier 3 interventions for these students.

Besides looking at individual students, you can use technology to identify areas of the school that might be trouble spots. For instance, if you determine that you have a high number of office referrals from the cafeteria, you might consider adding more staff to monitor lunches.

One of the pre-conference sessions at this year's BET-C focused on the use of PBISApps, a suite of applications developed at the University of Oregon that helps educators make better decisions to support PBIS.

For instance, the School-Wide Information System (SWIS) is a web-based system for collecting and analyzing student behavior data. The reports available within SWIS allow PBIS teams to review school-wide referrals and understand behavior patterns in greater detail. Users have the ability to drill down to specific incidents and then visualize the data with SWIS to share with administrators, counselors, and parents.

Another program, Pearson Review360, helps educators report on student behavior in their classrooms, analyze these observations to identify key trends, develop intervention plans for individual students, and track the progress of these efforts. It also includes universal screening tools to identify students who have special behavioral needs.

Streamlined PD

One of the challenges to sustaining a PBIS initiative is staff turnover; when the teachers and administrators on the original PBIS team leave, are there systems in place to make sure these efforts will continue?

Staff development is critical to sustainability. Review360 includes a library of professional development videos to support PBIS implementation.



Use technology to identify areas of the school that might be trouble spots, like the school cafeteria.

Another professional development service for PBIS comes from KOI Education, which is one of the co-sponsors of BET-C. It's a series of multimedia books available for the iPad through iTunes. These digital manuals, which are also available in print format, help guide teams through the PBIS implementation process.

Deeper student engagement

When students are engaged in learning, they are less likely to act inappropriately in class. Boredom, on the other hand, frequently leads to a disciplinary problem. And when students tune out, it's often because the content is either too challenging or not challenging enough.

Technology can help personalize the learning for students, by adapting the level of instruction to students' needs or allowing them to work at their own pace. And that, in turn, can reduce the number of behavioral issues that teachers see in class.

When implemented with fidelity, PBIS can result in a more positive school climate, with fewer class disruptions—which can lead to improved learning. And technology can play a key role in that success. 

Karen Gifford is director of the Behavior, Education, Technology Conference (BET-C) in Phoenix, Ariz.



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Mastering the Mixed-Device Classroom

Classrooms with a blend of computing devices are becoming more common. Here's how to handle instruction across multiple platforms.

Whether students are bringing their personal devices for use in class, or schools are adding newly purchased devices to their existing technologies, a growing number of classrooms are becoming mixed-platform environments.

This approach can have many benefits. For instance, it allows schools to leverage the devices they already own, or that their students own, to extend computing to more students in a cost-effective way. It also gives educators and students the flexibility to use the best tools for the task at hand, such as tablets or e-readers to view content and laptops or Chromebooks to write essays. And it enables students to gain exposure to a variety of platforms, which can serve them well beyond school.

"There are some intrinsic benefits to exposing students to multiple technology platforms," said Jonathan Wylie, a technology consultant for the Grant Wood Area Education Agency in Iowa. "If students graduate from high school and are only proficient in one device, they are potentially less valuable to an

employer than students who are able to navigate their way through life on a Mac, PC, iPad, or Chromebook."

But mixed-device environments pose several challenges as well, especially when students are collaborating or sharing projects. Here are several strategies for overcoming these challenges and making instruction work seamlessly in your schools.

Challenges of teaching in a mixed-device classroom

"Consumption of information is not usually a problem with a mix of devices," said Kathy Schrock, an online adjunct professor for Wilkes University in Pennsylvania and an independent educational technologist. "The problem shows up when students are asked to create a product."

When students bring their own devices to class, "there is invariably a wide range in the types of items that get brought in," Schrock said. She recommended establishing a minimum standard for devices allowed in a BYOD initiative,

for example, requiring a smartphone or tablet that can use a web browser.

"As in the days of requiring every child to have a graphing calculator, there is always a concern about students who cannot afford (even a) base-level device," she said. "Small tablets and the iPod Touch have come down in price, and having these available for students to borrow is important."

Another solution is to have students complete their work in groups, she said, making sure there is at least one device in each group that is powerful enough to create the final group product.

Another challenge in a mixed-device classroom is enabling the student to share the work with the rest of the class.

"There are both hardware and software solutions available that allow mirroring of devices," Schrock said. "One way to make sure that everyone can mirror their screen is to have a box of VGA or HDMI adapters available that work with iOS devices, Macs, Windows machines, Chromebooks, Microsoft Surfaces, Android tablets, and so on."



It's not easy to collect these items, but fortunately projector manufacturers are coming out with apps that enable students to share their screens wirelessly through the projector. For instance, Epson recently introduced free software called Moderator, which allows teachers to control multiple presentations simultaneously.

Up to 50 students can connect to an Epson projector at the same time from a laptop, iOS, or Android device, using Epson's free iProjection app. With the Moderator software, which runs on a Windows or OS X computer, teachers can display up to four student screens at once.

Cross-platform collaboration

Today's learning environments are places for collaboration, and mixed-device classrooms should allow students to share assets when working together on a project.

There are some collaboration-oriented apps that will work across any platform, said Marie Bjerede, project director for the Consortium for School Networking's Leadership for Mobile Learning initiative. For instance, an app such as Edmodo resides on your device, yet communicates through the cloud. "Those are the easiest ones to use when you want to have students collaborating together and having that same, shared experience," she said.

Another option is to use cloud-based services such as Microsoft Office 365 Education or Google Apps for Education, or anything else you can access through a web browser.

"The browser levels the playing field," Bjerede said. "If you're using a browser-based application, then anyone can access it as long as they have a device with a browser on it."

Shaelynn Farnsworth, a school improvement consultant for Area Education Agency 267 in Iowa, said using cloud-based services "alleviates many of the managerial issues that arise" in mixed-device environments. A Google Certified Educator, Farnsworth has had success using Google Apps because they are supported on any



"Work with your students to identify what apps they can find on their devices for different purposes. It's not necessary for student projects to be identical, and it's not necessary for the tools that they use to be the same, either."

device, require little or no storage space on a student's device, and are accessible from anywhere students have internet access.

"One bonus with Google Apps for Education is the offline functionality, which allows students to continue the learning even in times where Wi-Fi access is not available," she said.

Schrock said she uses a shared Google or Dropbox folder to share files across various platforms. "Attaching the assets to a shared Padlet board is another way, or emailing the assets to each other solves the problem," she added. "For quick sharing, I like an app called Flick. It allows students to share photos, notes, and documents with anyone who has an iOS, Android, Linux, Mac, or Windows device, by simply placing an item on their Flicktop and 'flicking' it to the other device. Everyone needs to be on the same Wi-Fi SSID for this to work, but it works great."

Chromebooks are catching on quickly in education, and last year they even surpassed iPads in sales to U.S. schools. Instead of running software from the machine's hard drive, these devices run

applications within Google's Chrome web browser. To support this very different approach to computing, Google and other software developers have created an ecosystem of apps and extensions designed specifically for the Chrome browser.

Chrome apps are web-based applications that operate within Chrome, with no additional software needed to run them. Chrome extensions are extras installed within the Chrome browser to customize the user's experience. These apps and extensions are available from the Google Chrome Store.

As long as you are logged in to your Google account, you can access your Chrome apps and extensions from within the Chrome web browser, using any device (not just a Chromebook).

"Within the Google environment, students can create essays, presentations, and reports that can be shared with teachers and other students, allowing for rich collaboration," said Tom Daccord, director of EdTechTeacher, a provider of ed-tech professional development. "It makes sense to use a platform that can be

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used any time and cuts across many devices: laptops, Chromebooks, smartphones, iPads, and other tablets.”

Let students choose their own tools

Although there are browser-based apps that students can take advantage of regardless of what device they are using, it’s important to remember that not every student needs to be using the same app or tool, Bjerede said.

“If everybody needs a note-taking app or a video editing app, there’s no reason those all have to be the same,” she noted. “Work with your students to identify what apps they can find on their devices for different purposes. It’s not necessary for student projects to be

identical, and it’s not necessary for the tools that they use to be the same, either.”

It’s the instructional goal that is most important, and not the tool itself, Farnsworth agreed. “Is the goal of your task to have students create an iMovie, or is it for students to communicate their message effectively using multimodal strategies?”

When the focus shifts from a specific tool to the instructional goal, “it allows for student choice in demonstrating their learning,” she said.

Teachers should research and come up with a toolbox of apps and websites that will work for various kinds of devices, based on the type of project that is being assigned, Schrock said—whether it’s an infographic, a blog post, a digital story, a public service announcement, or something else.

“There is no need to reinvent the wheel in order to see what is out there,” she said, noting that she has assembled a list of tools that work for various platforms on her website, <http://schrock-guide.net>. EdTechTeacher has posted a similar list on its own site.

Once you realize there is no reason to be restrictive, “then students will have the same experience that we do as professionals when we collaborate,” Bjerede concluded. “We choose the tool that fits the devices that we have and the goals we’re trying to accomplish.” **eSN**

The former editor in chief of eSchool News, Dennis Pierce is now a freelance writer covering education and technology. He has been following the ed-tech space for more than 17 years. He can be reached at denniswpierce@gmail.com.

Four things to consider when managing a mix of devices

From an administrative point of view, here are four suggestions for making a mixed-device environment work successfully:

Make sure your network can handle the load.

If students will be using cloud-based services instead of software stored on their device, this will take up more bandwidth. Check with your school district’s network team to make sure your network infrastructure can support this additional load.

Pay attention to Wi-Fi compatibility.

“When you’ve got these different devices coming in, they may be on different Wi-Fi standards,” said Marie Bjerede, project director for the Consortium for School Networking’s Leadership for Mobile Learning initiative. “And that can reduce your overall network performance.”

Depending on the type and age of a device, it might use any flavor of Wi-Fi—802.11b, g, n, or ac. Some of these operate on the 2.4 GHz wireless band, while others use the 5 GHz band. Newer wireless routers can support dual-band operation in both ranges simultaneously, but if you don’t own dual-band access points, some students might have trouble getting online.

Consider mobile application management (MAM).

How you acquire apps also could be problematic when using various devices.

“Buying apps from the Apple Store is different from buying them from the Google Play store, which is different from buying apps from the Chrome Store,” Bjerede said. “And if you want to buy something for your Windows devices, there isn’t an option for any kind of bulk purchasing available at all. At least Apple and Google have some bulk purchasing capabilities.”

Because all of these services have different policies regarding app ownership, things can get complicated fairly quickly.

“If you want to really go cross-platform, I would recommend taking advantage of a mobile application management service that comes with a mobile device management program like JAMF or AirWatch,” Bjerede said. These MAM services are limited by the constraints imposed by the app stores for each platform, so “they can’t suddenly make Windows bulk purchasing happen, or support Android license reuse—but once the purchasing is handled, they can make app distribution and management easier.”

Don’t forget about charging and storage.

While Bjerede believes students should be allowed to take their devices home and charge them before returning to school the next morning, schools also should keep mobile carts on hand for storing and charging devices not in use during the day. Many manufacturers make carts that can accommodate a wide range of devices, with various charging needs.



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Moving from Goals to Apps

Seymour Papert begins his landmark book “Mindstorms” with a story about a set of gears he played with as a child. The tangible experience of working with gears accelerated his understanding of physics in a way that would have been much harder with only books and lectures. Because of this, he refers to gears as “objects-to-think-with.”



Tom Daccord

One simple way of understanding our ed-tech pedagogical theory is that we don’t want computing devices to just become replacements for notebooks and textbooks. We want them to be objects to think with. We want students to use them to construct understanding, to demonstrate their learning within their courses of study, and to mess around with.

In workshops and presentations, we frequently get asked: “What can the iPad/Chromebook/Surface actually do?” We encourage folks to use a different language, one that positions people as actors rather than technology. What can a teacher do with an iPad/Chromebook/Surface? Even more importantly, what can our students do? Whenever possible we want people acting with computing devices, rather than technology acting upon people—or out there by itself.

In a blog post, Beth Holland of EdTechTeacher poses the questions, “Why iPads?” and “Why Technology?”

Beth answers these questions this way:

- Because I want my students to communicate in complex and modern ways.
- Because I want my students to make their thinking visible.
- Because I want my students to document their thinking as they work through a process.
- Because I want my students to have multiple ways through which to interact with learning objects.

In a workshop, Beth was approached by an English teacher who wanted to know where to begin with iPads. Beth’s response was to start the workshop with a set of content-specific learning objectives.

For the English and Language Arts classroom, the “because” might look

something like this:

- I want my students to demonstrate their knowledge of the parts of a story.
- I want my students to master the concept of the story arc.
- I want my students to make a personal connection with their text and then communicate that back to their peers.
- I want my students to collaborate in order to better comprehend difficult texts or dramatic works.

Beth then showed the teachers how students could use technology in support of these learning objectives. She proceeded to outline a learning objective and then construct a project to help students reach the objective, such as: I want my students to demonstrate their knowledge of the parts of a story.

Learning Objectives: In addition to learning the story elements, students learn:

- to write a constructive review.
- to assess the credibility of an author or source.
- to create a sense of visual hierarchy for their information.
- to document their sources.

Learning goals then lead to a learning activity: “Project: Book Posters—Students create a movie-style poster to advertise their book. Poster elements must include the title, author, a representative image, a ‘hook’ to get others to want to read the book, a quotation of a credible review, and a student review.”

Beth then chose apps for students to use that support these objectives: “While this could be created on paper or using a computer, with an iPad and apps

such as Skitch, Visualize, or Text Here, students can quickly create, publish, and share their work. By integrating with the Camera Roll, these posters could eventually include audio narration with Fotobabble, be included in a book with Scribble Press or Book Creator, or added to a video project with iMovie or Animoto.”

Beth’s priority was not to find cool apps or tools selected primarily for their engagement factor. Apps were selected because they supported and aligned with a vision. Apps played a purposeful role in the support of student learning.

Toward that end, we have created a collection of annotated apps for teaching and learning on our website. Unlike other lists that promote so-called “cool tools,” or lists of content apps by academic disciplines, our list is driven by specific learning goals that promote critical-thinking, creativity, collaboration, and community-mindedness. In a nutshell, our focus is on what kids can do and not so much on what teachers can teach.

As we remind teachers, the fundamental challenge of integrating technology is not in learning how to use apps. The challenge is in imagining the innovative ways in which the tool can be used to enhance student learning. Ultimately, it’s to conceive of ways in which the iPad/Chromebook/Surface is a pathway to new challenges, new creativity, new collaborations, new connections, and ultimately new opportunities for students to demonstrate and share their understanding. More than anything else, we get excited at the possibilities for students to create performances of understanding and use apps as a tool to think with.



Tom Daccord is executive director of EdTechTeacher (www.edtechteacher.com), a professional learning organization. This article includes excerpts from “iPads in the Classroom: From Consumption and Curation to Creation” by Tom Daccord and Justin Reich.

Google

continued from page 1

tered my school, and then myself—as a teacher host, advocate, volunteer, and guru all at the same time. I might not have known what I was getting into, but I knew that I would do anything to inspire my students to grow and learn in all areas of STEM, but in particular, computer science.

Today my school is a Google CS First site, meaning we host CS First clubs that take place before or after school as an enrichment experience for students in grades 4-8, where they learn about computer science and coding in a hands-on way—learning by doing. As part of the process, I made my classroom available for local volunteers, or gurus, to come in to help and connect with students, opening up my school to the community. Our gurus receive detailed information about where to go, when to show up, and even how to locate my classroom. Most importantly, a background in computer science is not a requirement.

The support from Google CS First is tremendous. Upon request, they sent a loaner set of 30 headphones and peripheral materials for the students that included passports, sticker-badges for each day's modules, detailed scripts, certificates of completion, and directions for exercises. All materials are also available for free download from the club site, with coding done in Scratch, a programming language that uses building blocks to form commands. All of these supporting materials make it seamless for anyone, be it a volunteer guru, teacher, or parent to come in and help out. A suggested script, as well as breakdown of time for each activity, is also included.

Google CS First's modules are engaging and cover a variety of themes such as "Sound and Music," "Game Design," and "Storytelling," with more on their way. They include informative screencast tutorials that make it easy for both students and volunteers to follow along. The agenda that comes with the program includes a timer to help keep the club on track, and breaks down ses-

sions into segments with a countdown visible to the facilitators.

The modules are run in eight-day sessions, with the first day used as a basic introduction to the club and the Scratch platform. Students are encouraged to explore and build something "surprising" using the blocks in Scratch on this first day. The screencasts also make reference to how computer science



Tasks in the CS First curriculum support collaboration and exploration.

tists help people do things by writing code and in so doing, solve a multitude of problems in a variety of fields, from medicine to robotics. After that first day, students are led through a series of structured tutorials to help them build a portfolio of their very own projects.

At the same time, they are encouraged to spend time outside of the official club times to customize their creations and add their own touches to their projects. In building these projects, the students are sequentially introduced to various "blocks" that perform key functions, such as the repeat loop and if-then commands. These help build the foundation in computational thinking so that they gradually gain the confidence and ability to tweak and create their own versions of these initial projects. At the end of each session, students have the opportunity to celebrate their coding projects through a scheduled showcase time. Collaboration through sharing ideas and helping one another is encour-

aged, and learning takes place almost unconsciously in a supportive environment through engaging tasks.

Simply signing in with a Google account under the "Get Started" section of the CS First website will start the ball rolling, and there are training resources to help teachers and volunteers to get a feel for what a typical CS First session will look like (support staff also respond to

concerns almost immediately). For students who may be ready for more computer science after this initial taste, there are additional resources on the site where students can even learn to program using HTML, Javascript, and more.

At my middle school, I have opened my computer lab for a girls' lunchtime coding club where we go through the day's activities and share projects with one another. It has been a great time and I have gotten to know all about the girls and their interests. Most importantly, they have had their interest in computer science ignited, and even possibly their career trajectory altered. Informal experiences with computer science such as these are full of impact. Truly there is nothing more powerful than learning by doing—and learning that you can do anything, including computer science. 

Janice Mak is a teacher and instructional coach at the Paradise Valley Unified School District in Arizona.

A digital media lab that costs next to nothing

A green screen and a Mac turn a storage space into a hi-tech playground

By Donna DeLuca

Back when I was in school, class projects were limited to written reports, dioramas, and posters—things we could create with pencils, paper, Popsicle sticks, and glue. To say our students today have many more options available to them would be the understatement of the 21st century.

With the advent of lightning-quick computers and gorgeous digital media tools, students are now dreaming up PowerPoint presentations, Prezis, websites, wikis, photo stories, and more—things limited only by their imaginations. Creating these types of digital projects has become second nature to them, and they have no concept of a time when these technologies were not available. In fact, creating digital media has become a very personal matter. Just look on Facebook, YouTube, Vine, Vimeo, Instagram, and Twitter and you will see that our students are creating and sharing digital content on a daily basis.

As educators, it behooves us to find ways to provide opportunities that allow our students to engage in learning activities relevant to their lives. As a library media specialist, I know there's no better place to provide them with these opportunities than a school's own library media center.

With all of this in mind, I recently decided to renovate an old storage room in our school library into a cutting-edge digital media lab. My plan was to provide a space where students and staff could explore their creativity using digital media, and my hope was that they would use these tools to create authentic, curriculum-related projects.

I'm happy to say, that's exactly what happened. Our students are now creating weekly newscasts, commercials, book trailers, weather reports, and much more. They have become roving reporters, interviewers, editors, directors, commentators, producers, and

musicians. They have become creators of content and not just consumers. And, amazingly, I was able to do it all without breaking the bank.

If you think you would like to create a digital media lab in your school, here are some tips to get started.

Find a space: You don't need a large



Buy a green screen for as little as \$20.

space, especially if you are using a green screen. Our newscasts appear to be set inside a spacious studio, but they are actually recorded in our 12-foot by 12-foot storage room. Even if you don't have a separate room, you can easily set something up in a corner of your classroom or library.

Purchase equipment: Believe it or not, you don't need a suite of pricey computers and peripherals to get started. Right now, the extent of our equipment is a Mac. We use the built-in camera for recording and we began with iMovie for editing the video and for green screen keying (recently, we upgraded to Final Cut Pro). If a Mac is out of your budget, don't fret: There are some great iPad apps that will do the trick.

You will need a green screen, which I was able to purchase for less than \$20. You can also paint a wall green. We actually painted our entire digital media

lab green and threw in some green foam flooring for the total package. Some photography lighting is helpful, but not necessary if you have sufficient lighting in your space.

Recruit some students: Once you have everything in place, find a couple of tech-savvy students who are willing to experiment. The first few months, I had some students come in during their free periods to play with the equipment and software. We learned a lot and I can honestly say, I learned more from them than they did from me.

Create some sample projects: In order to pique teachers' interest in assigning projects using the digital media lab, the students and I created some samples, including a cloud project for a science class and a book talk video for English. We also began creating newscasts incorporating the school's daily announcements. Our newscasts have since become a weekly production that our students really look forward to, and these days our lab is regularly used for student projects.

So what are you waiting for? Keep in mind you don't have to be a technology expert to start a digital media lab. While not all of us are tech savvy, many of our students are. All we need to do is provide them with the tools and the opportunity, and I believe they will do the rest.

The next time you assign a project, think about allowing the students to create a piece of music, a newscast, a movie, a podcast, or some other digital project. Let them express themselves in a way that is most comfortable for them. I think you'll be as pleasantly surprised as I was. 

Donna DeLuca is a library media specialist at Accomsett Middle School in Smithtown, N.Y. To see some of the projects created by students in the digital media lab, check out her website at www.amsdmc.com.

Teaching handwriting using technology

By Peter West

Teaching handwriting to an entire class of students at the same time has always been a compromise. A teacher has always had to stand at a white board to show a class how to form letters, words, and sentences. Usually a whiteboard marker is used; modern technology has sometimes replaced a whiteboard marker with a digital pen that uses an interactive white board (IWB) or, more recently, an interactive projector.

But that's far from ideal. When standing at a board, there are usually students who cannot see what is being written. Teaching writing also involves teaching how to hold a pen. However, holding a pen to write on a vertical white board is different to holding a pen normally to write on paper on a desk. Thus, it is difficult for the teacher to model the correct grip. *The entire process is a compromise.* But these problems can be eliminated by the use of the appropriate technology.

Recently, my school has provided teachers with new tools that help simplify the process, including:

- A MiraCast device connected to classroom projectors. This allows the teacher to demonstrate effective handwriting from any location in the room as it projects the computer screen wirelessly to the projector. Every student in the room has a clear view of the board as the teacher does not have to stand up front.
- A pen-based computer/tablet—a Microsoft Surface Pro 3. This is compact and light enough to carry around the classroom.
 - The pen also produces fine lines suitable for writing. The tablet is also pressure sensitive, allowing thicker lines by pressing harder. All of the subtleties of traditional handwriting can be modelled.
 - The pen also looks and feels like a real pen, and thus is held in the same way a real pen is held. This allows the teaching of the correct grip.

- The infinitely adjustable kick stand on the Surface Pro 3 allows the tablet to be flat on the desk or slightly raised for a better writing position, and it can be positioned optimally for left- and right-handed students. The teacher can model the differences for each student from a student's desk while still demonstrating to the entire class.

- The Surface Pro 3 is the size of an A4 piece of paper, thus matching the traditional medium and keeping the student and teacher in a relatively familiar environment.

The teacher can sit beside any student to demonstrate effective letter for-

can easily move from desk to desk, allowing for one-on-one instruction where necessary. This has been invaluable, as some students take a lot longer than others to understand a concept and some students have special needs. It is easier to maintain the children's concentration and attention as my back is not to them. I sit with them or next to them. When you have your back turned, the children tend to start writing because they can't really see what you are doing, as you are standing in the way! I can honestly say that after teaching handwriting for 15 years, this is the best method I have ever used to deliver a handwriting lesson. The big clincher—



The pen also produces fine lines suitable for writing.

The tablet is also pressure sensitive, allowing thicker lines by pressing harder. All of the subtleties of traditional handwriting can be modelled.

mation while demonstrating to the entire class. The teacher can also have a student demonstrate to the class while remaining in his/her seat while holding a real pen in a real way.

Year 3 (third-grade) teacher Nikki Georgiadis has been using this combination of technology to teach handwriting to the whole class from any location in the classroom.

“Using this type of technology has allowed me to model body position, pencil grip, paper position, and the formation of letters and numbers,” she said.

“Being able to sit down and be ‘one of the kids’ shows them how to write. I

you are not in the way and the entire class is able to see what you are doing!”

In this case, technology has allowed a “learning sweet spot.” The combination of an appropriate pen-based computer, a MiraCast device, and an effective projector or screen finally allows handwriting to be taught to a class of students while also teaching the correct handwriting procedures. **eSN**

Peter West is director of eLearning at Saint Stephen's College in Australia. He has more than 15 years' experience leading K12 schools in technology-enhanced education, particularly blended learning using online learning environments.

Waterford Early Learning helps prepare Mobile County students for kindergarten

Alabama's largest school system is using this interactive program in its pre-K classrooms to give young children a strong foundation for success

Connecting families with high-quality early learning programs is among President Obama's top priorities. It's also important to Alabama's Mobile County Public Schools (MCPS), and the district is using research-based software from the nonprofit Waterford Institute to prepare young children for success in kindergarten and beyond.

In 2010, MCPS implemented Waterford Early Learning to help ensure that 4-year-olds were on track for kindergarten success. Since then, 73 preschools in Mobile County have used the software, and in that time, kindergarten readiness has improved dramatically, said Paula Reese, manager of school, home, and community programs for the district.



"Eighty-five to 90 percent of our pre-kindergarten students come in with very low pre-reading skills," said Reese, who oversees all of the county's public preschool programs. By the middle of the school year, she said, more than half of these children have progressed from the most basic level and are ready for more advanced instruction.

Between 1,300 and 1,400 qualifying pre-kindergarten students, including special-education students and students living in Title I attendance zones, use Waterford software in their classrooms. The county follows Alabama's Early Learning Guidelines for pre-kindergarten students, and teachers use Waterford as an intervention program to support those guidelines.

After completing a baseline assessment to gauge their abilities, students receive reading and math content that is

targeted to their specific needs and skill levels. "Waterford's baseline test puts the students exactly where they need to be, so they can learn exactly what they need to learn," Reese said.

Preschool students use the Waterford software at one of several learning centers they circulate among during the school day. Each student receives 30 to 45 minutes of instruction per day on the software, and they can use the program during quiet time as well, if they are not able to nap.

The early learning system is designed so that students don't slip through the cracks or progress without developing important skills.

"Waterford is giving each child that extra personalized dip for what they need," Reese said. "If they're not progressing with a skill, Waterford is going to re-teach it to them. Waterford provides that re-teaching mechanism that is so often needed for our students."

The software sends progress reports to teachers, so they know which students need extra time on math or reading tasks. These reports also let teachers know which students have excelled and are ready to move to another learning level. In essence, the reports show teachers exactly what they need to focus on for each child.

Student reaction has been nothing short of enthusiastic.

"The students love it," Reese said. "They lose sight that they're in a classroom. You hear them singing and commenting out loud. You see the excitement on their faces—Waterford allows them to be successful, and that success carries over into their school day."

Besides learning math and reading skills, the students also learn "how to use the computer for something other than playing games," Reese said. And by working independently, the children learn self-regulation and how to follow directions.

Use of Waterford Early Learning has been so successful at the preschool level that three MCPS elementary schools are piloting the program in grades K-2 this year as well.

"Waterford provides the intervention needed so students stay on track," Reese concluded. "It is developmentally appropriate, it's geared toward those skills students need to be successful in kindergarten, it lets students move at their own pace, and it gives teachers the information they need to work with each child."

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Four key digital learning developments

Annual survey finds that students say digital learning supports self-directed learning and collaboration

Laura Devaney
Director of News, @eSN_Laura

Fifty-eight percent of high school students in a national survey said they use their own mobile devices for learning in school, and 47 percent of teachers in the survey reported that their students have regular access to mobile devices in their classrooms.

The information comes from Project Tomorrow's annual Speak Up survey, which polls students, parents, administrators, and educators about their technology use in and out of school.

"We definitely have seen an increased sense of urgency around how to effectively use digital tools and content to be able to impact student learning," said Julie Evans, CEO of Project Tomorrow, during a congressional briefing to discuss the data.

"There isn't one recipe for implementing digital learning, particularly personalized learning. ... As part of that, we're seeing more and more use of digital content," she said.

The 2014 survey focuses on key areas that drive digital learning and innovation in classrooms.

Mobile learning and digital equity

"The issue of digital equity and access, particularly in terms of out-of-school access to the internet, is top of mind for many education leaders today," according to the report.

Forty-seven percent of surveyed school and district technology leaders said digital equity and students' out-of-school internet access are among their most challenging issues this year.

Regular access to technology continues to be a main focus, too. Thirteen percent of surveyed high school students and 21 percent of surveyed middle school students said they have

no regular access to technology in schools.

"Today, as many as 7 in 10 teachers assign homework that requires access to the internet and broadband," said Jessica Rosenworcel, the commissioner for the Federal Communications Commission, at the briefing. As many as one-in-three households in this country do not subscribe to broadband. Where they overlap is what I call the 'homework gap.' Nearly half of all educational technology leaders are concerned about student access to the internet outside of school. Their concern is spot-on."

According to Pew Research Center statistics released in April, 2015, Rosenworcel said, "the homework gap is real. There are 5 million households of the 29 million households in this country with school-aged children that are falling into this gap and do not have access to broadband at home."

Though many reports cite data indicating that low-income students report access to smartphones, more must be done, she said, especially because of the growing number of jobs that require digital skill.

"A phone is just now how you want to further your education. We can do better than this. After all, we need to," she said. "School-aged kids without broadband at home are not only unable to complete their homework—they enter the workforce with a serious skills gap."

Blended learning

Forty-five percent of surveyed district administrators said district blended-learning programs are showing positive results.

While only 25 percent of surveyed students said they are currently involved in a blended-learning environment (25 percent of surveyed students in grades 6-



Digital equity is a priority for schools.

8 and 23 percent of surveyed students in grades 9-12), those students indicated that blended learning:

- Helps them learn at their own pace (64 percent)
- Helps them develop creativity skills (63 percent)
- Increases their collaboration with peers (61 percent)

Twenty-one percent of surveyed students in grades 3-5 said they regularly watch teacher-developed videos outside of their classroom.

Online learning

Online learning remains in the majority, with survey results indicating that only 27 percent of participating high school principals do not offer any online courses for students.

Surveyed principals said they offer online learning options to their students in order to:

- Keep students engaged (69 percent)
- Offer academic remediation (62 percent)
- Provide advanced coursework (47 percent)
- Find a solution for hard-to-staff subjects (44 percent)

While only 8 percent of 2013 surveyed high school students said they were interested in fully online learning, 24 percent of this year's participating students said they would like to take all of their classes online.

This growing interest is reflected at

the middle school level, with 44 percent of surveyed students reporting a desire to take math classes online.

The survey also shows that 28 percent of surveyed students in fully online learning environments create and post digital content, compared with 18 percent of traditional students in the survey.

STEM learning experiences

This year's survey compared student data from three different STEM environments (after-school computer programming/coding clubs, STEM academies, and school-sponsored tech support teams) against students who did not participate in those environments.

Data showed that early STEM engagement is key to sustaining girls' interest in STEM subjects.

Middle school girls in the survey are 38 percent less likely than male peers to express interest in a STEM career, and 32 percent of surveyed high school girls reported the same.

Sixty-four percent of surveyed ele-

mentary school girls in grades 3-5 said they were interested in programming and coding.

In addition to defined classroom technology-supported learning, self-directed learning is growing in leaps

The issue of digital equity and access, particularly in terms of out of school access to the internet, is top of mind for many education leaders today.

and bounds, and surveyed students provided anecdotal evidence that they pursue learning outside of structured classroom time.

One possible reason for this growth could be students' increased access to digital tools, resources,

and the internet at home.

"Two big questions emerge from this year's report: Are we ready to support a new kind of educational ecosystem that acknowledges learning as a 24/7 enterprise, and what do we need to do today to enable and empower these kinds of student-centric digital learning experiences for all students?" asked Evans. 

In fall 2014, Project Tomorrow surveyed 431,231 K-12 students, 35,337 parents, 41,805 teachers, 2,485 librarians, 680 district administrators, 3,207 school administrators, 442 technology leaders and 6,653 members of the community representing 8,216 public and private schools from 2,676 districts. Schools from urban (30 percent), suburban (30 percent), and rural (40 percent) communities were represented. A little more than one-half of the schools that participated in Speak Up 2014 were Title I eligible schools. The Speak Up 2014 surveys were available online for input between October 6 and December 19, 2014.

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How IT can help shape their district's vision

CTO Pete Just helps give students the digital toolsets and support that they need to succeed now and in the future

By Bridget McCrea

When he thinks back to 2010-2011, Pete Just, chief technology officer at the Metropolitan School District of Wayne Township in Indiana, remembers how hard K-12 schools were pushing to integrate iPads into their classrooms. The race was on to put the devices into the hands of every student, regardless of the fact that the tablets were largely untested in the K-12 environment. "They said iPads were going to transform education," recalls Just, "and I just didn't think that was going to happen."

A former teacher who taught high school science and media for 13 years, Just compares the iPad to the film projector—an innovation that at one point was touted as revolutionary for the classroom. In reality, he says the projector didn't change or transform anything. "All it did was let students sit and watch something," said Just. "It was a great tool to add to the classroom, but it didn't do any transforming at all."

Handing out iPads

Flash to 2015 and Just says uncertainty about the role that mobile devices and other tech tools actually play in the learning experience largely remains unknown. "We basically backed up a truck to the school, unloaded a bunch of skids, and handed out devices to students; but the devices themselves didn't do anything," said Just. "Along the way, we found out that successfully embedding digital learning is really about the instruction itself and it centers on the teacher."

Just also recalled his transition from teacher to CTO in 2009. It was an eye-opener for Just, who was handed the keys to closets that were literally "crammed with technology and equipment" that teachers refused to use. "They didn't want anything to do with it, because it wasn't helping them do their jobs," he said. "It didn't help instruct students."

As tech coordinator, Just says he was charged with inventorying those and other technology tools and making sure they were put to good use. Today, he sits on the superintendent's cabinet and informs the board, the superintendent, and principals about relevant digital trends and how those trends impact education. "It's a whole different job than it was just five or six years ago," Just said. "We talk about how we can adjust our approaches to help student learn more easily, and give them new opportunities for success."

Unfortunately, there's no single class or educational track that an aspiring K-12 CTO can take to learn how to fill that evolving role. "The job has morphed dramatically in the last 10 years," he explained, "to where the leader of a digital integration really needs to be someone who can make partnerships and who can watch the trends and pull in the important pieces of new technology opportunities and see directly how they can fit into a classroom. That's a very different definition of what we do."

And with the proliferation of new educational and consumer technology tools not letting up anytime soon, Just expects the K-12 IT department's role to change even more over the coming years. "We're at a pivotal point right now as many schools are midway into or just beginning the digital leap."

Taking tech out of the equation

When those skids of iPads were being doled out to students in hopes that the devices would individually enable learning years ago, Just quickly picked up on the fact that the technology itself should not be the focal point of such implementations. Instead, he says, CTOs and their technology teams must know how to leverage educational tech and tools into learning opportunities for



Pete Just

students (and, equally as important, into something that teachers can actually leverage and use effectively).

The good news, Just said, is that there are strategies that K-12 IT departments can use to make that happen. In most cases, it starts at the grassroots teacher level. "We have the tendency to start talking about IT implementations with our peers, principals, and district-level leaders," said Just, "when in reality those discussions need to start with the teachers." The Wayne Township district, for example, has a group of 40 instructors who meet regularly to review new ideas and discuss opportunities with the district's IT department.

Enlisting "early adopter" teachers to serve as role models for other instructors is another good strategy that Just's district uses. Calling these early adopters "fertile soil," he says those teachers have a knack for knowing what will and won't work in the classroom setting. "Before we buy anything we show it to these early adopters," he said, "knowing that they'll give us candid feedback on whether the tools will work, whether they will enable greater interaction among students, and other valuable feedback." 

Bridget McCrea is a contributing writer for eSchool News.

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15 iOS apps for teaching and learning

A green screen and a Mac turn a storage space into a hi-tech playground

By Alex Cornacchini
and Stephen Noonoo

Each month, *eSchool News* rounds up a list of helpful apps for iPhone and iPad users arranged by theme, in partnership with the website APPitic.com, an app resource site with more than 6,000 apps in more than 300 subcategories. Here, we've gathered a handful of those apps. You can access more on the APPitic site, which arranges its apps by category, subject, and more.

eSchool News has selected these apps—originally curated by Apple Distinguished Educators via APPitic—that may help you meet your instructional needs.

Ten free apps to build logic skills

1. NumberOne Brain

Game that challenges players to find a given number in a different color as quickly as they can, with time bonuses and losses for correct/incorrect answers. According to the developers, the number/color contrast stimulates both sides of the brain.

2. Tangram XL

Simple version of the popular Tangram puzzles designed with kids in mind. It is designed to avoid unnecessary decoration to keep kids' attention on geometric concepts.

3. Animal Sudoku

This twist on the classic Sudoku puzzles assigns an animal to each number, ramping up the concentration required to solve each puzzle.

4. Chess With Friends

Multiplayer chess game lets users play against each other or find random opponents. However, it requires a Facebook or Games With Friends login.

5. FairPairHD

Matching game that challenges players to find the associative link (such as rain and an umbrella), and then remember those links going forward as they solve boards with increasing complexity.

6. Finger Physics

Fit together different and moving shapes to solve puzzles. The free version features around 100 levels with various objectives and difficulty levels.

7. Flow Free

Connect matching colors with pipe to create a flow. Pair all colors, and cover the entire board to solve each puzzle.



8. Genius Brain

Using clues, players must identify in which column a given icon is located on a large board in this version of Einstein's puzzle. It is aimed at improving your visual memory, ordering your thinking, helping form cause-effect relations, and more.

9. Monorail

Draw lines to connect "stations" and create a working monorail system in this game that challenges visual/spacial/geometric skills. According to the developers, kindergartners can solve the beginner levels. Mathematicians have struggled to solve the most difficult ones.

10. iDetective

Players help solve real detective cases using gathered clues, their own logic skills, and a list of suspects. The free version features four different solvable cases.

Five useful apps for students with autism

1. ABA Flash Cards, Free

Designed for young children with autism and other learning disabilities, Kindergarten.com has created flash

card apps to stimulate learning and provide tools and strategies for creative, effective language building. Different apps include the alphabet, animals, sports, actions, emotions, earth science, famous places, and many more.

2. iPrompts, \$40

Developed by the parents of a child with autism, iPrompts provides several useful visual prompting tools to help impaired individuals transition from one activity to the next, understand upcoming events, make choices, and focus on the task at hand.

3. Speech with Milo: Interactive Storybook, \$2

Developed by a licensed speech-language pathologist, Speech with Milo is a series of apps that help teach children with learning disabilities about verbs, nouns, parts of speech, and now with this app, interactive stories. An original story, this will keep any child interested in this book with interactive features on every page and the ability to record their own story. This app helps build storytelling, boost confidence, and develop narrative skill.

4. Choiceworks, \$7

Choiceworks is an essential learning tool for helping children complete daily routines, understand and control their feelings, and improve their waiting skills. This app is designed for caregivers to provide clear and consistent support to foster a child's independence, positive behavior, and emotional regulation. Key features include the schedule board, waiting board, feelings board, and image library.

5. NLConcepts Autism: Sort & Categorize, Free

Natural Learning Concepts is a website that is known for producing products for autism, speech and language, and special education. They created this app to help children with learning disabilities differentiate between items, understand their function, and sort items into broader categories. 



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Why you should stop testing and start assessing

One educator issues a challenge to all: Skip the Scantron and discover what students really know

By Torrey Trust

Ed. note: *This column was adapted from Innovation In Action, a new monthly column from the International Society of Technology in Education focused on exemplary practices in education, appearing the third Monday of each month on eschoolnews.com.*

During the first day of the semester, one of my students commented: “Your class is the easiest class I have this semester. You don’t have any tests.” I laughed, but the student was serious.

I teach graduate-level courses about educational technology, such as Online Tools for Teaching and Learning. The thought of asking students to take tests to show their knowledge had never crossed my mind. My goal has always been to design courses that capture the interest of the students and inspire them to take charge of their learning. I just don’t think that tests can capture my students’ true learning experiences.

Don’t get me wrong, I still assess learning. I just do it in a way in which students often don’t realize that they are being assessed. For ongoing, formative assessment, I ask my students to design, discuss, build, create, present, reflect, and share. My students create videos, interactive timelines, 3D models, animations, tutorials, websites, wikis, blogs, interactive images, digital stories, podcasts, screencasts, presentations, mindmaps, and collaborative essays, to name a few examples.

These creative products, as I call them, allow my students to demonstrate their mastery in a variety of ways and provide me with a way to assess what my students are learning during class and make adjustments to my instruction.

Both the ISTE Standards for Teachers (2008) and CAST’s Universal

Design for Learning principles recommend allowing students to express their ideas and knowledge in a variety of ways. Yet, too often, students are asked to sit at a desk for hours on end to take the exact same multiple choice, short answer, or essay test to demonstrate what they learned. In the TED Talk “The Myth of the Average,” Todd Rose made an invaluable point: “Even though we have one of the most diverse countries in the history of the world, and even though it’s the 21st century, we still design our learning environments like textbooks for the average student.” According to Todd, when you design for the average (e.g., one-size-fits-all tests), you design for no one.

With widespread access to the internet and thousands of free online tools, students can express their knowledge and demonstrate their skills in a variety of ways. In February, 2015, I was an observer-participant in the SOOC4 Learning, a small open online course about universal design for learning. The entire course exemplified the principles of designing equitable learning opportunities, activities, and assessments. Each week, course participants were asked to complete one task from a list of six options and post it in the Google+ Community. It was amazing to see how many ways there were to demonstrate competency. If you take a look at the Week 1 course products at www.sooc4learning.com, you will see that every single assignment is different.

It is time for teachers of all levels to start thinking about assessment in a different way. Assessment does not have to mean: test. So, I’d like to challenge all teachers to start thinking outside the Scantron bubble and design more effective and equitable assessment tools. One-size-fits-all multiple choice exams may



Testing is but one form of assessment.

save you time during grading, but can students really demonstrate the depth of their understanding by filling in a bubble? Essay exams allow students to show their depth of knowledge, but does every student have to respond to the same prompt in the same way? That’s like assessing a monkey, penguin, and elephant by asking them to climb the same tree (Google “standardized testing” if you’re not familiar with this reference).

Before you design your next assessment, think about how you could create multiple options for students to show what they have learned (see the SOOC4 Learning Tasks pages for examples). The ISTE Standards for Teachers (2008) recommend using new technologies and digital tools to design varied assessments, and fortunately, there are hundreds of free digital tools that students can use to demonstrate their knowledge.

It is important to note that providing students with more options for expressing their ideas does not equate with making exams (or classes) easier. You can still ask challenging, thought-provoking questions, but instead of requiring your students to sit in a classroom and demonstrate expertise in the skill of recalling information, allow them to choose their own way to express their knowledge. You may be pleasantly surprised with the results. 

Torrey Trust, Ph.D., is an assistant professor of learning technology at the University of Massachusetts Amherst.

Creating PLCs teachers want to use

By Michelle Eaton

At my district, the Metropolitan School District of Wayne Township in Indianapolis, we have found that changing the way we think about teacher training not only benefits staff developers and administrators, but schools, the district as a whole, teachers, and ultimately students. A critical part of our revitalized professional development plan has been the use of professional learning communities (PLCs), which are essentially groups of educators who work collaboratively and share ideas, often in an online format.

From our experience, here are seven suggestions for PLCs that work.

1. Create an online environment

Our PLCs use the same learning management system that we use with students. This provides two key benefits. First, it is an easy way to model good online and blended learning. Our teachers have shared on several occasions that participating in an online community helps them better understand how they could create similar environments for their students. Second, many LMSs provide tools that make communication, sharing, and collaboration successful for groups of learners.

2. Use it for informal learning

After creating the online space, your online community can be used for lots of different types of professional development. It is a wonderful place for informal learning to happen. Teachers can share ideas, post questions, and collaborate through this online environment in many of the same ways that they might share through social networks.

3. Try structured opportunities, too

Structuring opportunities for peer support in an online format has been successful in our district. For example, at one of our high schools, teachers self-select to



PLCs offer educators a chance to use flipped learning, too.

participate in blended professional development courses called “Innovation Centers” led by their peers. While they have scheduled face-to-face learning time, the teachers leading each course create a space for online work and learning as well. Additionally, our lead technology teachers in all of our buildings collaborate in a PLC with study groups on self-selected topics of interest.

4. Flip the model

PLCs also provide a space and opportunities for professional developers to “flip” their PD. In the same way that you might flip your class, staff developers and administrators can provide the direct instruction they are planning in a digital format beforehand and save the limited face-to-face time for true collaboration and planning.

5. Let teachers go at their own pace

At our virtual high school, Achieve Virtual Education Academy, many of the professional development meetings are led completely online in the form of learning modules. Teachers will work at their own pace throughout a given time frame on collaborative and engaging online activities. These learning modules are then available at any time should a teacher need to reference them later. Our teachers have responded

positively to this, because it gives them the freedom to learn at a speed comfortable for them while also modeling quality online learning techniques.

6. Build in time for learning

It is important to build in time for this type of learning. This should not be simply added on top of everything else on a teacher’s busy schedule. PLCs are much more likely to be successful if the time is given to truly participate.

7. Go slow; it’s not a race

Keep in mind that an environment and culture of sharing and collaboration is not developed overnight. I remember months of encouraging teachers to share ideas and questions publicly after they would ask me a question or share a resource with me. After several months of modeling and guiding these activities, the sharing began to happen more frequently and organically. Now, I help facilitate several groups that are truly active, collaborative learning spaces. 

Michele Eaton is the virtual education specialist for the MSD of Wayne Township in Indianapolis, Ind.

This piece is adapted from a new monthly column from the International Society of Technology in Education appearing the third Monday of each month on eSchoolNews.com.

How to build fearless PLNs

Try these best practices for finding and collaborating with fellow educators

**By Randy Hansen
and Nicole Zumpano**

Research indicates that nearly 50 percent of educators will leave the field within the first five years of entering a classroom. This is an astounding number that costs the U.S. more than \$2 billion annually. Why the high burnout rate? Many cite isolation and lack of support as reasons for exiting the field. Sometimes new teachers are nervous to admit they may be struggling. By helping educators build strong connections



Collaboration is important for PLNs.

to others, both within their buildings and around the world, we can begin to create more stability in the profession and refresh our passion for education.

Teachers are natural collaborators. From the school hallways to what could be called today's water cooler—social media—teachers love to share and discuss what's working, what isn't, and the finer points of why or why not.

Collaboration is very much a process. It's about ideas and problem-solving and some trial and error, with reflection playing a critical role. To support this process, we will unravel the process of building a Professional

Learning Network of fellow educators, and how it can remove isolation and improve your professional practice.

1. Identify a mentor

Every teacher was once a new teacher and experienced the emotions of learning about their students, school, pedagogy, and all that paperwork. Remember that any trepidation you may have about your practice has most likely come from questions posed by another educator in your building. Identifying a mentor or key collaborator within your immediate environment should be your first step. Find someone you can work with, bounce ideas off, and say, "No, that won't work." This doesn't have to be a formal process, but instead should develop as more of an ongoing conversation, an opportunity to reach out and just ask questions.

2. Build a PLN outside of your building

As important as it is to have a go-to in the building it is equally important to have other points of view and opinions. Extend your PLN from your local mentor to the entire globe. PLNs allow you to use technology to pull ideas and resources to you as well as push out your thoughts and ideas. There are a multitude of resources available to begin building a professional learning network. Here are some of our favorites:

- **Twitter.** If you have not participated in Twitter chats, these are fantastic ways to connect at a deep level. There are hundreds of Twitter chats taking place at scheduled times. If you are new to chats, you can start by passively reading them without getting involved. Follow people in chats specific to your interests and look to see who they follow for additional ideas.
- **Teachability** is a social network developed by Pearson. Find communities to follow where you can ask questions,

share breakthroughs, and respond to others. There is a community specifically for new teachers.

- **Edmodo.** While many educators use Edmodo as a learning management system for their students, Edmodo offers much more. There are communities for educators to share and ask questions, and communities for topics including Common Core, professional development, and careers and tech.
- **Google+** not only has communities available for you to join, but gives you the ability to create your own.
- **Pinterest** is a place to connect with others, learn from others, and share your own content in a visually appealing format.

3. Grow in stages

As we stated earlier, developing a PLN is a process. There are several stages that you will experience as you develop your very own personalized learning network. Jeff Urtecht wrote a great post on his blog, "The Thinking Stick," on his interpretation of the stages: immersion, evaluation, know-it-all, perspective, and balance. Finally, share your ideas. Ideas spread around the globe like wildfire, and it is a confidence boost when someone else benefits from your ideas (or in turn hears how you benefited from theirs).

4. Approach PLNs with curiosity

Look at your PLN as a source of inspiration to connect ideas. Life is not linear; we move side to side, one step back for two steps forward. Some of the biggest leaps forward can come from a setback (consider the pacemaker and Post Its). As you stay informed and build your PLN, remember that inspiration and ideas do not emanate from education-related networks alone. Inspiration comes from many different places. For example, we like looking at Kickstarter projects or Kiva for real-

world activities to incorporate into our classrooms. It's about being inquisitive.

5. Share

Take time to share and ask others to work with you and to innovate, reflect, and share together. This seems to be the most difficult step for some. Reach out and ask someone if they'd like to work on a project. Equally important is giving back to your PLN and your community. Consider presenting at local, state, and national conferences. ISTE's annual conference is a wonderful opportunity, but so are state affiliate conferences. ISTE affiliates are in all 50 states, and around the world, and provide wonderful opportunities to connect and collaborate.

6. Collaborating means failing sometimes

Our penultimate thought is about failure. Too many times people are afraid to fail. Collaborating on new ideas, projects, or strategies will involve some amount of failure. Reflecting on failures and successes only improves your practice. Failure is not the end of a project, but a learning opportunity. Your PLN is not only a place for inspiration and making connections, but sharing what you've learned. You might be surprised how much support and feedback you get!

7. Stick with it

Collaboration can be complex. The process can be time consuming, and it takes effort to establish and build connections, but the rewards of new relationships and professional growth are well worth the effort. Collaboration is a 21st-century skill we're developing in our students. It's important for them and it's important for us. We need to be their role model and mentor and to continue to model a positive digital presence for them. Coincidentally, the collaboration

for this article stemmed out of a casual long-distance conversation between two friends and colleagues. See how easily that can happen? 

Randy Hansen is program chair, instructional technology, at University of Maryland University College and president, Teacher Education Network, International Society for Technology in Education.

Nicole Zumpano is a technology coach in Chicago Public Schools and an adjunct professor at Dominican University. Connect with the authors on Twitter @RandHansen and @nmzumpano.

This piece is adapted from a new monthly column from the International Society of Technology in Education, appearing the third Monday of each month on eSchoolNews.com.

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Librarians can lead the digital transformation

By Mary Reiman

Recently, as I was serving on a panel at the Texas Library Association's 2015 Annual Conference, one attendee explained to us how she is trying to keep up with the new technologies coming into her school. How, she asked, could she implement them successfully while continuing to provide the same services for which her library is known?

It's not an easy question to tackle, but it's one that the panel—part of Follett's Project Connect, which is aimed at shedding light on how librari-

Second, and this is the big question to keep in mind, what's best for the kids? We need to keep this at the forefront of our thinking. What do our students really need to help them become informationally and digitally literate? What will be most helpful for students to know and be able to do to be successful consumers and creators of information? How will we empower teachers to best serve our students?

In my district, our information-rich environment is now getting even stronger with our CLASS (Connected

the portal to the wealth of information available to our families, with links our online catalog and purchased digital content. However, the best way we are addressing the needs of our students and staff is by providing curated packages of the resources aligned to the curriculum—by unit and by lesson.

Curating resources may take a great deal of our time, but we realize the importance of analyzing the curriculum and determining where essential questions and inquiry lessons with deep, guiding questions are woven into the content areas. It's also essential to locate the most developmentally appropriate resources, both print and digital, and to put those resources into a framework for ease of access. This is how we build bridges and form partnerships with classroom teachers and curriculum specialists.

Just as we pored over our professional review sources to choose the best print resources for the students, our librarians are now selecting the best online resources and guiding students to that content through our Library Media Services online presence. Whether curating your resources using LibGuides or LiveBinders, or purchasing a product such as Follett Shelf Classroom Connections and WebPath Express, your students will be choosing their resources from the most appropriate content available.

Today, whenever we are asked why the digital conversion is so important, we have a solid response: We have the opportunity to open the world of learning, questioning, and thinking to our students in ways we have never had the capacity to do before.

It is exciting. It is challenging. It is transformative. Every child must succeed, and they will if we continue to determine the resources most important to that task, and if we continually ask ourselves: What's best for the kids? 

Mary Reiman is the director of library media services for Lincoln Public Schools in Lincoln, Neb.



At one district, librarians have taken the lead in curating digital resources.

ans can be a solution to the many challenges that arise from a digital transformation—was well-poised to answer. Based on my experiences as director of library media services for Nebraska's Lincoln Public Schools, I was able to come up with two suggestions.

First, pace yourself and determine what is coming off your plate. We need to continually re-think why we are doing what we are doing. Yes, we feel we need superhuman powers because our jobs are getting busier, but in order to sustain ourselves, school librarians really do need to determine which pieces of our work can no longer be priorities, and then let them go.

Learning for the Achievement of Students and Staff) Plan, which puts devices into the hands of each of our students, grades three through 12, and in classroom learning centers in K-2. Our librarians have taken the lead in aligning our digital and print resources. While we have had digital resources, such as online periodicals, , and databases for many years, these rich resources will now be accessible to all of our students on a daily basis.

We've also looked at how we share our resources. We have worked very hard to establish an online presence throughout the district. Each of our 56 schools has a school library web page,

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A school without a library is like...

Libraries and media centers are central to a healthy learning environment. School librarians are emerging as leaders as they help teachers learn valuable technology integration skills and help students become 21st century digital citizens. And yet, school library funding is increasingly vulnerable during budget time. According to the American Library Association, the total number of school librarians has "steadily decreased" since 2006-2007, which is not surprising since more than 9,000 schools in the U.S. have no library, according to Agile Education Marketing. Carl Harvey II, former president of the ALA's American Association of School Librarians (AASL), wrote in the Huffington Post, "Cuts to school librarian positions betray an ignorance of the key role school librarians play in a child's education, especially in this era of Google, when today's students are flooded with an unprecedented volume of information. . . . The value of school librarians has been measured in countless studies demonstrating that strong school library programs help students learn more and score higher on standardized achievement tests."



Source: Agile Education Marketing



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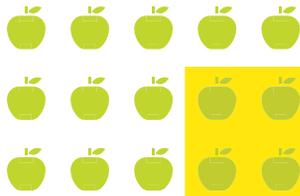
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