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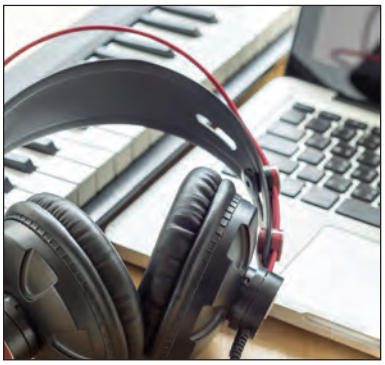

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eSchool News

Technology News & Innovation in K-12 Education

Vol. 19, No. 3 | eSchoolNews.com | August/September 2016

Flexible furniture—and learning

The way classrooms are designed can have a big impact on how students learn

Research shows environment can affect learning outcomes.

By Dennis Pierce

For generations, most high schools have been designed with a cookie-cutter approach "that can be reproduced easily," said Ashley Smith, who works with the architectural firm Smith Design Group. But that's certainly not true of the new THINC College & Career Academy in LaGrange, Ga., which Smith helped design.

Housed in a building on the campus of West Georgia Technical College, THINC looks nothing like a traditional high school. Instead, it has the look and feel of a Google office building,

Flexible, page 20

Making the most of carts

By Bridget McCrea

They're used to charge, secure, store, and distribute tablets, laptops, and mobile devices—and in schools that aren't using one-to-one take-home initiatives, they've become a mainstay.

Carts, those waist-high metal cabinets on wheels, often hold dozens of devices, perfect for classrooms that need technology on the go. The elementary English teacher who is using a blended learning approach in her

Carts, page 24

A makerspace for less than an iPad

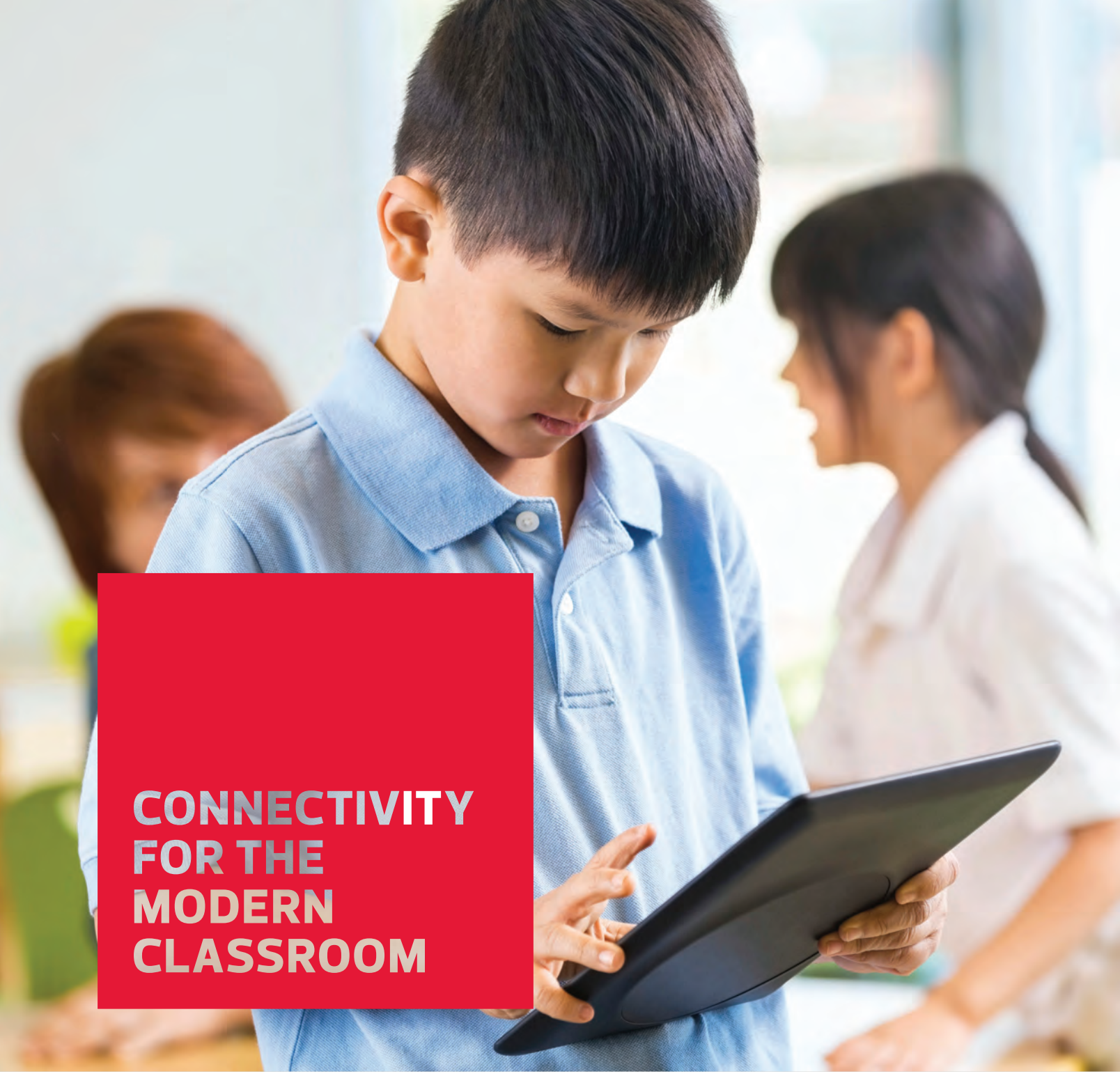
By Kristina Holzweiss

Where others see trash, I see treasure. Reusing, repurposing, and recycling items that can be found in the kitchen garbage can, on the curb, or collected by friends and families help educators save money while protecting the environment.

Today, our library makerspace has developed into a 21st-century learning laboratory, with funding from grants and through the generosity of individuals and organizations that support our DonorsChoose projects. But it wasn't always this way.

In 2013, I began creating a makerspace in our library with only recyclables such as yogurt containers, bottle caps, and toilet paper tubes that I had been saving over the summer. I scoured the library storage cabinets to find office supplies including markers,

Makerspace, page 12



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5 ways to gamify writing in the classroom

Believe it or not, writing is a natural fit for gamification

By Joan Selby

You've surely noticed how your class gets engaged as soon as you introduce a game into the teaching process. The students get competitive, but that's a healthy competition you want to nurture.

Have you ever thought about teaching writing through games? It's a great strategy that helps students overcome the lack of motivation they have regarding writing assignments. Robert Monroe, a writer for the website EduGeeksClub and a father of a 10-year-old, explains how he made writing attractive for his son: "I realized he was bored whenever he had to write something for school. I know how fun writing can be, so I found a way to turn it into a game. I set up a private online diary and gave him brief prompts every day. He received points for each 'level' he passed and a prize for every big achievement. I noticed great improvements in his grammar and style in a really short period of time."

Needless to say, you'll need an effective strategy that will help you introduce writing games in the classroom. Read on; we have the tips you need.

Understand the problem

Before you can make your students like writing, you need to understand why they don't. One of the biggest problems with the assignments is the fact that they are boring. Plus, teachers tend to make them more challenging than necessary, so the students lose motivation even before they start working on them.

The entire process of research, outlining, writing, and editing takes a lot of commitment. When you turn it into a game, you need to make it less challenging and more flexible. For example, you can create teams and allow your students to work together on the research stage for a day. Then, they can all focus on storytelling according to the principles you provide, and you can publish all stories on a blog.

Give them a competitive edge to motivate them to achieve better results, and try to create some graphics to accompany each story. That will be your reward for them.

Set precise goals

Every game needs a goal. If, for example, the point of the game is to write a story, you need to make it very specific. You may ask your students to show how the main character overcomes a personal flaw, such as shyness or laziness.

Once you set the main goal, break it up in stages. You know that each game has levels, don't you? For example, the team can write a paragraph to pass the first level. Each member should contribute with their own sentence for the paragraph, and the content has to be coherent. Once they pass level one, they can continue to a higher level, and you ask them to add another element to the story (such as a new character or a challenge).

Set some rules

A game has to be founded on rules; otherwise it would quickly get out of hand. Just as you have a grading system for their papers, you should have a point system for the games. If, for example, you create blogging quests, your students should know exactly how many points they need to get onto the next level, and how they can earn those points.

You can start with a maximum of 30 points and reduce 2 points for every mistake in grammar and spelling, and 5 points for each mistake in logic. Make these guidelines clear before the games begin.

Games come with immediate results

You know how students have to wait for days before they get a grade on their papers? That's stress they would all like to avoid. Games give immediate feedback, so they keep the enthusiasm levels high. Draw a chart on the whiteboard, so everyone can understand the point system.

Games remove boredom from writing.

When your students realize that they can do something right now to beat the other team, they will get more engaged to achieve better results.

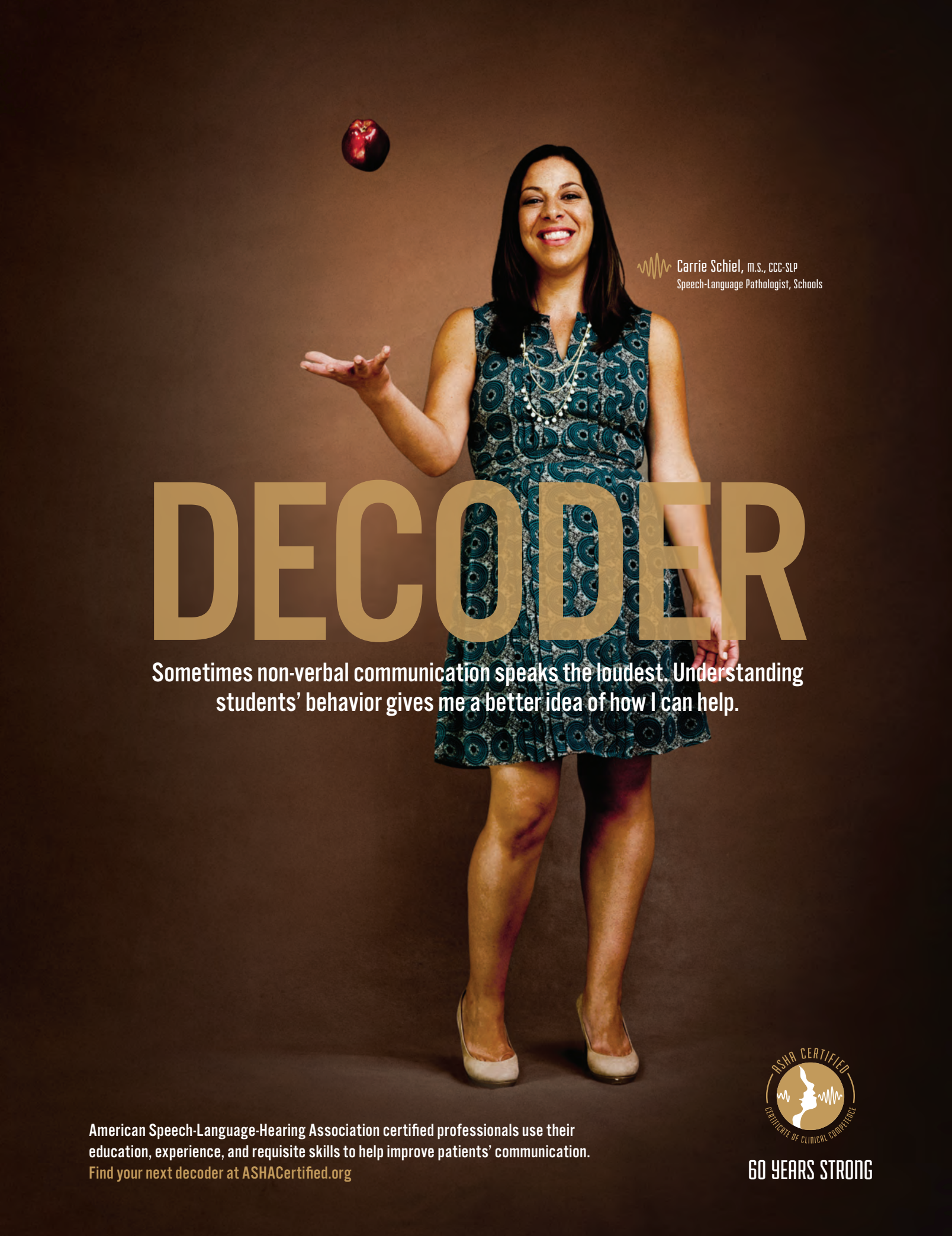
Rely on the right tools

Technology can make the gamification of the writing process much easier. There are different tools you can use, so don't stop exploring what the internet has to offer. You can start with these tools:

- **Rezzly**–it enables you to design fun quests, which your students can access through their smartphones or tablets.
- **ClassBadges**–a tool that helps you develop a reward system in the form of badges.
- **Edublogs**–a safe blogging environment that you can use for publishing the challenges and results.

Educative games are a great addition to the teaching process because they make the classroom more dynamic while enabling the students to develop new skills. Even the most complex skills can be practiced through gamification. You can develop different games that will make writing attractive for you students, so don't waste time and start experimenting. Your students will love the new approach. eSN

Joan Selby is an ESL teacher and a blogger at www.medium.com/@joanselby.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Let students show what they know with these gorgeous slideshows

Shadow Puppet EDU lets students demonstrate understanding in creative ways


Tom Daccord

Powerful Evergreen Apps strike a great balance between flexibility and ease, and can be used in many different situations for a variety of purposes. Take Book Creator, for example.

Book Creator facilitates the easy creation of multimedia books, reports, stories, and many other variations of written, visual, and audio communication. Yet, there are creative limitations to the app that can only be overcome by app smashing other app content directly into its pages. As I discussed last time, Tellagami enables students to create speaking avatars, and these can be inserted directly into Book Creator pages. App smashing Tellagami into Book Creator is one useful strategy to enhance the creative possibilities of a single Evergreen App and enable students to express what they know in different ways.

Another intuitive and versatile app to app smash with Book Creator (and other apps) is **Shadow Puppet Edu**, a free iOS app that will play on both an iPhone and iPad. With Shadow Puppet, students and teachers can easily create a video slideshow consisting of text, images, narration, animation, and music. With these multimedia possibilities, it's easy for a student or teacher to create a video presentation, a video tutorial, a digital story, or a portfolio on any number of topics.

Creating with Shadow Puppet Edu is easy and intuitive. Tap **Create New** and you can easily add content from various resources. Shadow Puppet Edu has built-in student-friendly resources to make content insertion easy and safe. For instance, the Education Search option includes copyright-free images from the Library of Congress, the Metropolitan Museum of Art, the British Library, and NASA. All a student needs to do is to enter a keyword to discover a series of free images around that topic.

There's also an Image Search to locate images via Flickr and Media Commons. Other helpful resources include a Map Search, for a city or location, and a Famous Landmarks section, which includes a series of historically and culturally significant places including the Great Wall of China, the Great Pyramids, the Roman Colosseum, Stonehenge, and more.

> *It's not a stretch for young learners in kindergarten, first-, or second-grade to create their own presentations.*

Simply tap on an image or video taken from either your device's Camera Roll or one of the aforementioned image partners and then tap **Reorder** to arrange these items in the order you prefer for your slideshow. (You insert up to 100 images in any single Shadow Puppet EDU video slideshow and any video can be up to 30 seconds in duration.) Once you have all the images or video you wish to use, hit the **Next** button and start adding various elements to your presentation. For instance, tap **T** for text and add a title, then add animation, such as a title spin, a title zoom, or a title fade-in and fade-out. You can adjust the font size and color as well.

You can add music, too. Shadow Puppet Edu provides eight songs that you can choose from to use on a select slide or as background music for the entire presentation. You can add your own voice and narrate as well. Simply hit **Start** and talk through the slides. So, a slide could contain an image, text, background music, and your voice. If you make a mistake, you can simply undo it and come back and edit what you have created.

When the slides are complete to your satisfaction, tap **Save** and your video slideshow is saved not only in the Shadow Puppet Edu app, but also in the iPad or iPhone Camera Roll. From this point, open Book Creator and insert your Shadow Puppet video onto a page.

Since it's so simple to create a Shadow Puppet Edu presentation, it's not a stretch for young learners in kindergarten, first-, or second-grade to create their own presentations. And if students stay within the Education Search section, images are filtered so that adult content is excluded.

Students can create all sorts of stories, tutorials, portfolios, math explanations, and more in Shadow Puppet Edu to complement and support what they may have already created in a Book Creator report. Need more activities? Just visit the Ideas section in the app for Common Core-aligned activities organized by Family Heritage Map, Historical Landmark, City Math, Symbolism in Art, Weather Report, and Guess Who?.

In all, there are a bevy of ways students can use Shadow Puppet EDU to show what they know about a curriculum topic. eSN

Tom Daccord is director of EdTechTeacher, a professional learning organization.

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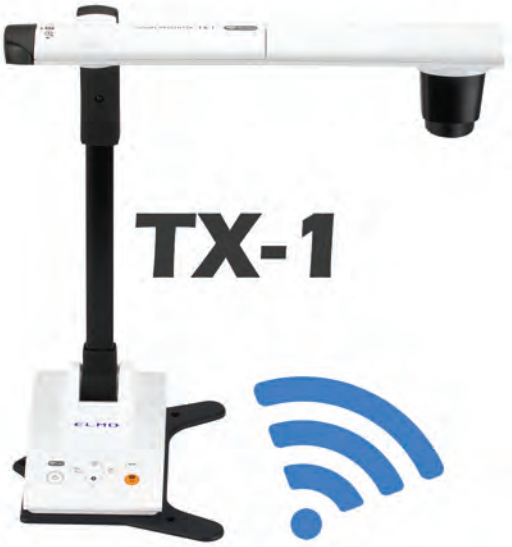

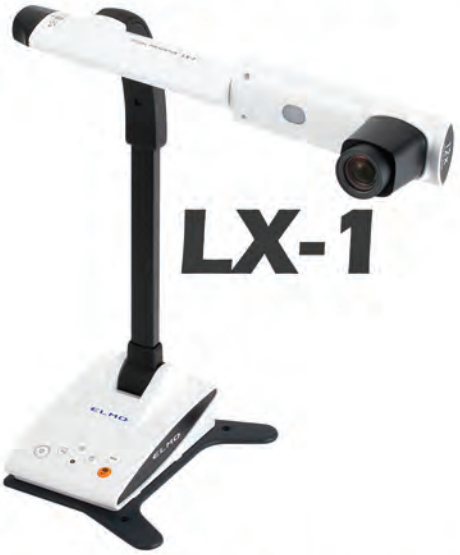

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Engage parents using the tech they love

Get more parents involved using phone-friendly video and social media

By Kelly Wade

Teachers have become pretty adept at doing more with less, but in our efforts to offset funding cuts, we often overlook a very important and inexpensive resource: parents. In fact, parents can make such a big impact that researchers have found that schools would need to increase per-pupil spending by more than $1,000 in order to achieve the same results gained by parental involvement.

Let students help with outreach.

The National Association for the Education of Young Children's research on Family Engagement and Early Childhood Education notes that:

"When children's progress can be tied to classroom activities and home activities, development and learning are strongly reinforced and further family involvement is inspired. Discussing changes in a child's readiness skills can open a dialogue about the child's strengths and any areas of potential concern for families or teachers. Then families and teachers can work in partnership to ensure that children continue to receive appropriate instruction and related experiences to further their development."

I am fortunate to have very involved parents in my classroom this year, but for many teachers, that isn't the case. This is not a shaming of parents. For working parents, reading a weekly newsletter and reviewing homework is just one more thing in an already jam-packed schedule—multiplied by each child in the family. I get it. It's exhausting.

Even if parents can and want to be involved, there are other barriers, like the fact that classrooms and teaching may no longer resemble what parents remember. Experiential learning, flipped classrooms, and new standards have turned the familiar into foreign, and this can be intimidating. So how can we bring them back and get them engaged with their kids' learning? The same way we engage their kids—with technology!

Today, more than 90 percent of families own mobile devices, and nine in 10 families have some kind of internet access, even among families below the poverty level. And we know that regular updates on children's growth can encourage families to engage in more learning-related activities at home. Leveraging the technology they are already using can be a powerful strategy to re-ignite parental involvement.

Social media

Three-quarters of online parents use Facebook, so creating a Facebook Group can be a good way to communicate with parents and share information, post student work, and add classroom photos and videos. However, because there have been privacy and legal concerns with teachers posting to the popular social media platform in the past, some districts and schools prefer that their teachers shy away from using Facebook. A great alternative is Shutterfly—the Share Sites offer a great way to quickly share compelling classroom visuals with parents, but in a way that is much more private. Students love sharing these visuals with their parents, pointing out friends and interesting classroom elements that paint a better picture of what the students' daily experience looks like, so the conversations happening between parent and child are often much richer than what follows "What did you do at school today?"

Digital portfolios

We use SeeSaw, but there are plenty of other options in this space. It's a digital portfolio platform that allows me to post student work and other learning artifacts, so that parents can see exactly what their students are doing in the classroom. And students and parents can upload content from home through the app, which is often more efficient than signing off on a form that they reviewed their student's homework.

Other media

Blogging: Parents are spending nearly 3 hours a day scanning the internet—in line at the grocery store, waiting for soccer practice to end, etc. Make it easier by providing updates digitally by creating a blog. Think keeping up a regular posting calendar seems daunting? Give students some ownership and let them take turns creating posts about what's happening in the classroom.

Stories: Most content created for young learners isn't meant for parents, so (shockingly!) they aren't always pumped to watch and learn alongside their kids. There are exceptions, though. My students and parents love StoryBots, which are short, funny educational videos and interactive learning games (bonus: it's free!).

Language tools: Working with ESL parents can be challenging. And because young children can, at times, be unreliable narrators, it is best not to use them as translators. Services such as Google Translate and TalkingPoints allow teachers to communicate in the parents' native tongue, which is critical when articulating challenges and opportunities for growth. eSN

Kelly Wade is a kindergarten teacher at Collins Elementary in Grand Rapids, Michigan.

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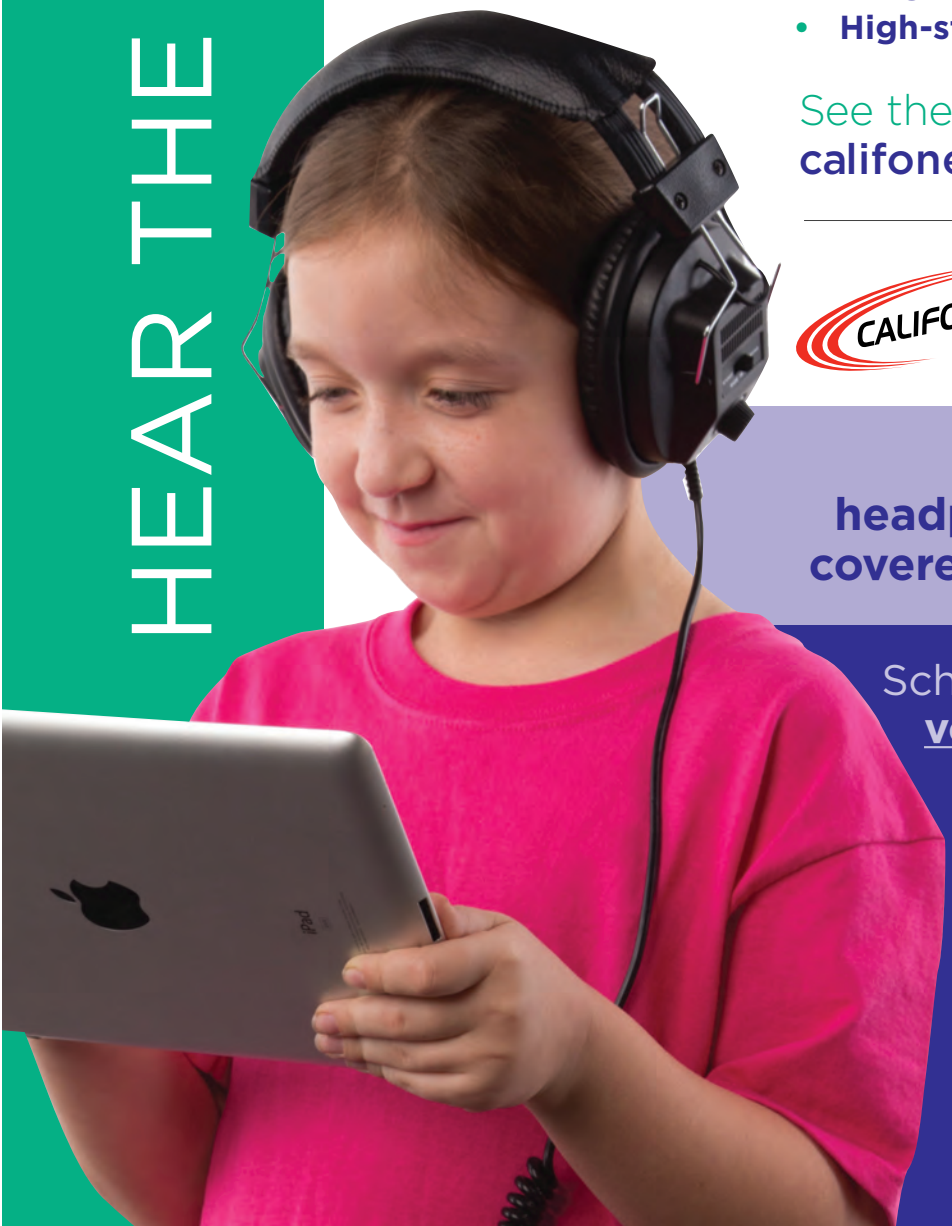

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Stop asking whether laptops improve learning

By Peter West

It's a question we hear all too often—from parents, technology critics, and, of course, the news media: Do those pricey laptops schools buy actually improve academic results?


Peter West

On the surface, it seems logical. Schools make big investments in technology and stakeholders want to see a return on that investment—by way of better school ratings or big jumps in test scores. But really, the question is superficial and shows a limited understanding of what is needed to enhance teaching and learning using technology.

Laptops by themselves change little. They are simply one component of a range of things that need to change in order to leverage technology to enhance education. Introducing laptops while not changing the teaching and learning paradigm is of little use, and may even produce negative academic outcomes.

Tools alone are not the answer

The tools alone are not enough. Ever meet someone who decided to get fit, bought all of the best gym equipment, and never did much with it (and didn't get fit either)? Know anybody who took up a new hobby, such as photography, and then bought a lot of expensive equipment such as cameras, lenses, and software, but did little with it? A few months later the equipment was probably stored in a cupboard collecting dust. These cases are not uncommon, and we are usually not surprised as we realize that it takes more than just buying expensive equipment to become fit or an accomplished photographer.

Why do we change these expectations with education? Is it simply because laptops are a visible component and thus are easy to measure? However, a simple measure can produce simple and incorrect conclusions.

Instead of counting the number of laptops in an organization, we would be better off walking around a school noting the number of classrooms in which teaching and learning have changed—and I mean really changed, not just replacing paper and chalkboards with a brand-name laptop.

Degree of change in the classroom

Simply having students using laptops for learning is not enough. It is the type of activities being performed and the depth of learning that are important. The laptop is simply a window to the learning. If the "view" is poor, the results will be poor. If the view is rich and meaningful, the results will be rich and meaningful.

Is there success?

When a change begins in society, there are usually a number of lone innovators who take the change and apply it successfully. They look beyond the device, use it as just one of the tools available, and modify their teaching and learning—and they get positive results.

The concept spreads and eventually becomes mainstream. Malcolm Gladwell explains this in his book *The Tipping Point*.

There are many examples of lone innovators who are achieving success. One example is Stacey Roshan, an Australian educator who has used flipped learning with AP Calculus classes to improve learning. She has qualitative and quantitative data showing her success.

Rob Boriskin has had success flipping the classroom in the very practical area of ceramics. He has had increased enrollments, increased student satisfaction, and increased levels of skill development with students. The computer and technology are simply one part of their changed teaching and learning paradigm. Note that it is a teaching and learning paradigm that has changed; the technology is simply an enabler of this change.

There are also examples of teachers who don't really embrace the change and "have a go at this laptop thing." They don't get improvements and thus find disadvantages. This doesn't prove the technology doesn't work. It is no different than the friend who joins a gym to get fit, but complains a lot and doesn't take the time to learn how to use the equipment properly, doesn't follow through with the advice of his trainer, and eventually gives up because it hurts and is inconvenient. Yet nobody would imply that gyms aren't effective for body building and fitness.

Six main components

During the past year, I've identified six main areas that need to change in order for organization wide success to occur. These are: infrastructure; organizational leadership; mindset; staffing; professional development; and flexible learning spaces.

Laptops are one sixth of the first component—infrastructure; one of more than 30 key aspects in all. Yet some would expect that it is the definitive measure for success.

Looking at laptops and infrastructure alone as drivers of academic change is simplistic. It shows a lack of understanding of the big picture and the changes that must occur in the entire learning ecosystem for academic results to improve.

It is about time we, as educators, looked deeper and had more sophisticated conversations about technology in education. This is the biggest shift in education in more than 100 years. It deserves more-considered attention. Failure to do this would leave education as the only industry that does not need to evolve to harness the benefits of technology. Do we really believe that this is likely? eSN

Peter West is director of eLearning at Saint Stephen's College in Australia. Reach him at PeterWest@ssc.qld.edu.au.

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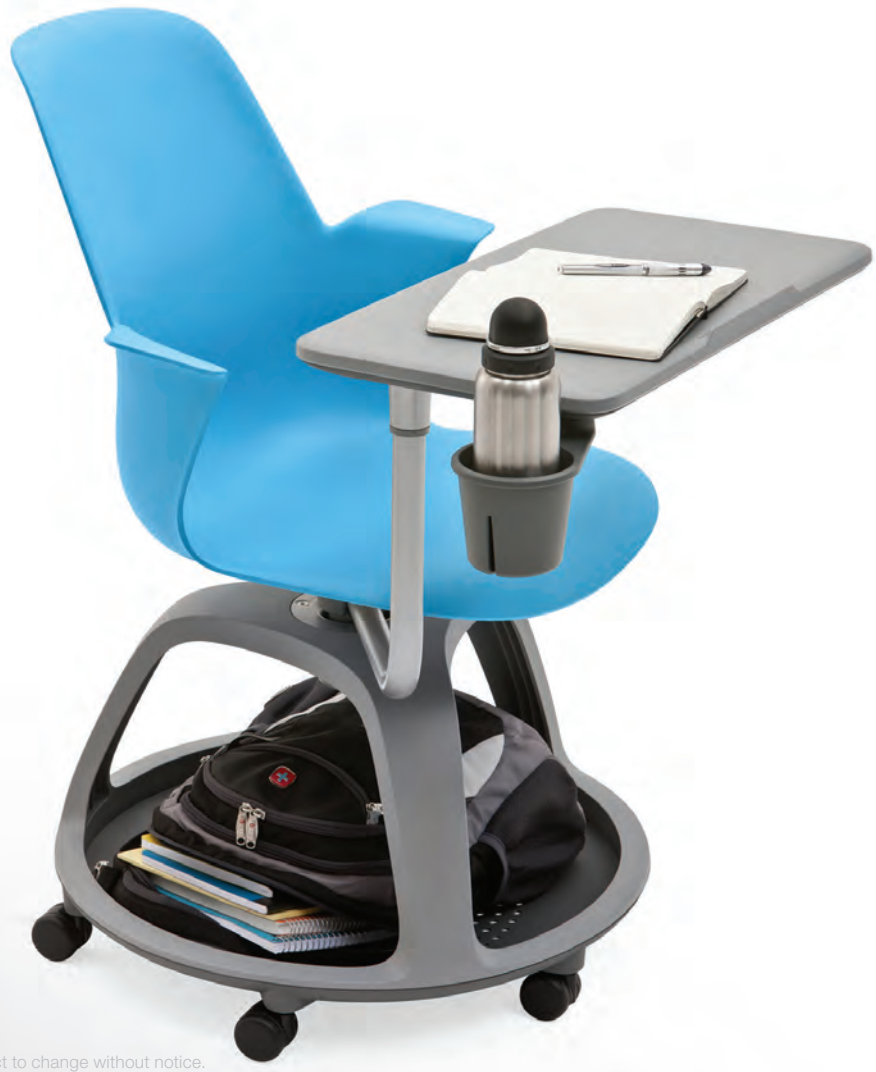


Makerspace

continued from page 1

Crayons, paper clips, rubber bands, glue, and scissors. Then I began raiding my own craft supplies. There was a physical space, and students were making things. I had a makerspace.

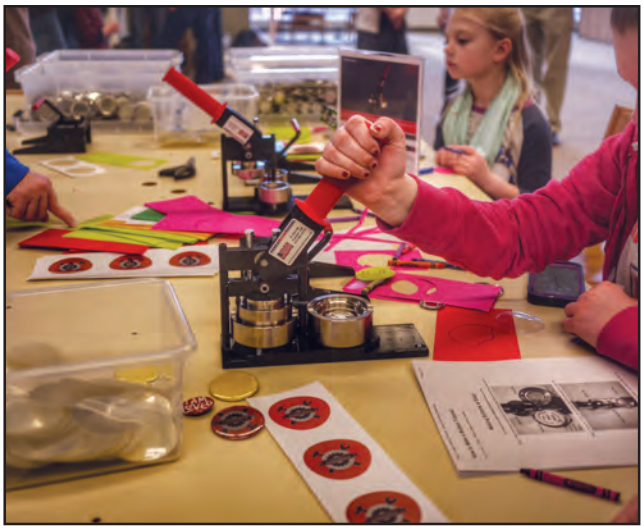
By now you have probably heard about makerspaces, and you might even want to create one in your library or classroom (or even in your own home). At first, just knowing where to start can seem overwhelming. You'll likely read many blogs and books, follow maker educators through social media, and attend webinars and workshops. You will either become energized at the thought of embarking on this journey or else paralyzed with fear that your makerspace will never be good enough. Here are some simple tips to help you along.

You can make with anything

The first fire was made by rubbing sticks with flint. With paper, your students can make origami cranes. With wrapping paper tubes, they can make roller coasters. And with unmatched socks, they can make water bottle cozies. Rather than focusing on expensive technology you don't have, find ways that you can recycle, reuse, and repurpose. When iPad time is over at home, and my children are bored playing with toys, they almost always find themselves digging through the "Invention Box" in our living room to create a Statue of Liberty torch with duct tape and two water bottles. If you don't already, start checking out the craft aisle of your local dollar store. Keep your eyes open for sales, coupons, and clearance stickers. Join the Freecycle Network at and check the free items postings on Craigslist. You'll never know what you might find.

You can make anywhere

Gary Stager, co-author of *Invent to Learn*, once said "The best makerspace is between your ears." If you don't have a space, make it. The average book in my library was published some time in the mid-1980s, so it was very easy for me to weed out titles such as *How to Train Pigeons* and *What the Astronauts Will Do on the Moon* to free up some shelf space. Consider wheeled, metal cabinets that can serve as much-needed makerspace storage. Attach magnets to the back of Lego baseplates and this cabinet can work double duty as a portable Lego wall. Consider any empty space that you have including walls, ceilings, doors, and windows. Any place can become a blank canvas for making (as long as you respect fire codes).



Creating a makerspace is an act of making itself.

Someone's grandmother may have bought more skeins of baby blue yarn than she needed to crochet her grandchild's first blanket. Share your vision of a makerspace with your administration and colleagues, as well as your students and their parents. Do you need 25 baby food jars to make water globes? Maybe a new mom on Facebook will begin saving some for you. Need pieces of wood to make photo transfers? Stop by your local karate studio and ask for their broken boards. One of my students brought in a large incomplete Lego set, and a mom answerd my call on Facebook for a blender. Chances are, if there is someone who can help you.

Your space will be different from everyone else's

Theodore Roosevelt once said, "Do what you can, with what you have, where you are." There is no one set definition of a makerspace. Your space will continue to develop and evolve to reflect the needs and desires of your students; within your comfort level and desire to learn about new resources; and funding from your school budget, grants, and donations. Have a vision of where your makerspace is going and outline a plan to get there. Realize, however, that your makerspace will not turn out as planned. Creating a makerspaces is, in itself, a process of making.

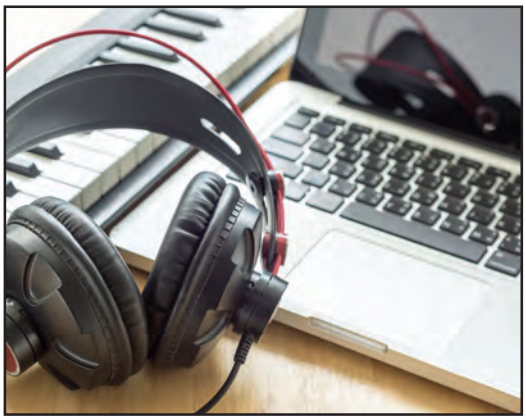
Don't wait until you are ready

If you keep reading and planning, you will begin creating reasons why you should not create a makerspace. The best way to get started is to dive right in with what you have before you spend any money on the bright, shiny things that catch our eye, such as the coveted 3D printer. Pace yourself, stop and reflect, and ask your students and faculty for feedback. But don't dwell on it. There will always be some new gadget or idea that will replace the old one. Consider the lasting effect of your purchases:

- Can they be used for multiple activities?
- Can they be used by a multitude of students in a variety of scenarios (age, academic ability, language)?
- Can they connect with other tools or resources that you already have, or will they serve as launchpads to future purchases? eSN

Kristina Holzweiss is a school library media specialist at Bay Shore Middle School in New York.

5 ways music and tech are adding a little STEAM to our lessons



Music engages nearly every area of the brain.

By Jilian Reynolds

The holy grail for those of us in education is a method that imbues students with higher-level thinking skills that stick, preparing them for what comes next in their lives. This means not just reaching all students with the content they must learn but making sure this information stays around in their heads to improve their school performance and knowledge base.

As we all know, this can be a tall order, but in my school district, we've been using the latest and newest technologies that help engage kids in learning. Our results have been significant and, I believe, worth sharing.

My job involves instructing both teachers and students how to implement technology tools into their lessons. All our middle- and high-school students in Moore County, N.C., have Chromebooks, so our digital tools must be compatible. As part of our constant brainstorming of new ideas and tools, my team heard about an online music recording studio called Soundtrap that runs on Chromebooks, and we developed a curricular program to use it at many schools in our district. I personally use it at both of my middle schools. One is a Title 1 school with a minority population of about 50 percent, and a free or reduced lunch status of about 65 percent while the other one is not a Title 1 school and its minority population is about 20 percent.

Regardless of how you use music, our results so far are demonstrating that as a learning aid, music is a powerful technique. Here's how we're reshaping our classrooms for the better.

It's captivating kids

My strategy was to have students take information and turn it into a song. As soon as I told the kids that they would be writing their own songs in class and performing them, their eyes lit up. They were captivated by the idea of doing something so creative and different that was still part of their lesson plan.

The content could be something about World War I in history or it could be science or be about the planets or anything that teachers want them to remember. All students have to do is transfer it into lyrics and then record it. We tell the kids to think of it as writing a poem using the information from class. Children at this middle-school age have such a strong connection to music and the famous singers who perform the music, so this approach really reaches them and makes them feel like they're little superstars.

Brain research shows key role of music

Reinforcing the concept of our program was the fact that there have been neurological studies using MRI and PET devices that demonstrate how as people are involved with music, more areas of their brain are fired. Music engages practically every area of the brain at once, particularly the visual, motor, and auditory cortices. This kind of thinking boosts the ability to plan, strategize, and focus on details, which translates to enhanced memory function.

We've seen this play out with our students. Certainly, they're having fun, but they tell us how easy it is to write an essay now after using the tool to record the content, because the information is right there, stuck in their heads like an earworm. Some of our students are using this music tool to earn higher test grades, because they're recalling what they memorized much better.

Groups of three are optimal

We put our students in groups of three; the group dynamic has its own obvious benefits. One student might record a beat, the next one record the song over it and the third could sing the lyrics they've written. Or some sing together and there's often one "tech person" in the group who will save the results, do the uploading, share with the teacher, and perform other tasks. In the midst of all this, students are also getting a healthy dose of the so-called four C's — critical thinking, collaboration, communication, and creativity.

Our program grabs students via the creative aspect of writing and performing music while still supporting our educational goals. For example, if we use this digital tool in a history class about World War I, the teacher would talk about concepts like militarism and nationalism in class. Then, the students use their computers to research the possible causes of the war, and create a song about it. It's teaching them, but in a different way that holds their attention.

Engagement, rather than poor behavior

Whenever I come into a classroom to do a creative music lesson in comparison to traditional pen and paper lessons, the kids are all engaged and everybody wants to participate. This includes the students who rarely raise their hands, don't pay attention, or even misbehave. We've had great results in both schools, but particularly in the Title 1 school because those kids particularly relate to

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Why digital PD needs an urgent overhaul

By Sarah Brown Wessling

Like so many of us, I have been grateful throughout my life for the professionals I've needed to call upon for vital services and expert guidance. The surgeon who had years of residency and practice before treating me on her own. Or the lawyer, who was constantly staying abreast of federal and state regulations in order to offer me sound advice.

Similarly, students and parents rely on me every day. As teachers, we are entrusted with our nation's children and their futures, yet many of us find ourselves isolated in classrooms without the right training or support. Others find ourselves supported by just one or two afternoons of professional development per year. As we collectively elevate teaching so that it may sit comfortably alongside other highly respected professions, we must think carefully about how to provide higher-quality continuing education for teaching.

The need for more practical and effective learning opportunities for teachers is especially important right now, with new academic standards being introduced and adopted across the country. As a teacher leader who has had this conversation with teachers, administrators, policy makers, and parents, I recognize an important distinction to which we must pay attention. People outside the profession often want to see a greater sense of urgency about our work. Often, the desire for urgency looks more like drawing small circles around teachers through evaluation, ranking, and sorting. For a classroom teacher, though, this has the opposite effect. When I feel small, I don't feel urgent. I feel scared and uncertain.

If we want a teaching force that is bold and innovative, then we must fight isolation, because when we're working together, we're sharing the responsibility to do better for our students. I am urgent when I see what my colleague down the hall is doing and I want to get better. I am urgent when I watch videos or read about other teachers doing amazing work.

In an increasingly connected world, educators need access to on-demand,online resources, with tools and platforms that facilitate collaboration and knowledge-sharing. More importantly, teachers should be able to see proven teaching methods in action, with students, in the context of their curriculum requirements and academic standards. But we're not there yet.

Teachers say that professional development doesn't help educators prepare for the rapidly changing nature of certain aspects of their jobs, like using technology and digital learning tools. That's important insight, given that the adoption of new initiatives without proper training or professional development can be a major source of stress for teachers in the workplace.

In an increasingly connected world, educators need access to on-demand online resources, with tools and platforms that facilitate collaboration and knowledge-sharing.

There's little question a change is in order. The Every Student Succeeds Act (ESSA) provides a clear definition of high-quality professional development and will create new opportunities for states and local districts. Not to mention that the new federal legislation clearly defines effective professional development as "sustained" and "intensive, collaborative, job-embedded, data-driven, and classroom-focused."

We're in a moment when the policy, the need, and the demand are aligned, so it's time to take action to improve learning opportunities for teachers at every stage of their careers. But it's up to district administrators and school leaders to implement real change.

The National Board for Professional Teaching Standards has a vision for how that can happen. As a natural extension of its mission to maintain high and rigorous standards for what accomplished teachers should know and be able to do, it is expanding access to what accomplished teaching looks like in practice. In 2015, the Board introduced ATLAS—an online platform that gives educators at every level the ability to study the practice of national board-certified teachers through in-depth case studies and instructional videos. Each teacher featured in a video case study provides a written annotation of his or her lesson, allowing users to see the thinking behind each decision and reflection on what worked or didn't work. Though it is just one example of what next-generation professional development resources look like, it's a step in the right direction.

Having the opportunity to analyze and reflect on what constitutes accomplished practice is why the national board process was instrumental in my growth as a teacher. It's why I understand the power of video and digital resources. It's why I know that making visual cases of exemplary instruction available to teachers through resources like ATLAS will help overcome feelings of isolation and foster an elevated teaching profession. When educators can see first-hand how to implement a teaching method that's aligned with a specific framework, they can more effectively translate that knowledge into accomplished teaching practice. eSN

Sarah Brown Wessling is a 17-year veteran of the high school English classroom, a National Board Certified Teacher, and the 2010 National Teacher of the Year.

How districts are closing the homework gap

3 out of 4 districts have no plans to provide off-campus internet. But there are solutions


Keith Krueger

The growing ubiquity of internet access and pervasive use of online information has changed the learning landscape forever. Students continue to benefit from enhanced connectivity throughout the formal school day, thanks to a $1.5 billion increase in E-rate funding in the last 18 months. However, demand and expectations for learning outside the school day are on the rise—and there are still many students struggling to complete homework online.

It is estimated that 5 million households with school-age children do not have high-speed internet service at home. Low-income households, especially black and Hispanic households, make up a disproportionate share of that 5 million.[1] The under-connection of low-income families is a real issue. Clearly, there is a great deal of work that needs to be done to narrow the inequitable homework gap.

This issue constitutes a new civil right; the right to digital equity; the right to connect to needed resources—anywhere, anytime. This is a civil right that cannot be achieved by school leaders alone. A holistic approach will ensure that school-aged children aren't reduced to little or no access. It calls for community leadership—connected and collaborative leadership.

Together, we're better

In 2014, nearly 75 percent of school systems surveyed did not have any off-campus strategies for providing connectivity to students at home and after school. Today, we see innovative leaders and students from schools working in collaboration with community leaders and organizations to narrow the access gap. Collectively, they have a greater capacity to gather and leverage resources to provide creative and effective solutions to the gap.

Paul Dakin, Superintendent of Revere Public Schools, teamed up with Mayor Daniel Rizzo to accomplish together what individual agencies might not have been able to achieve alone. Strategies identified to address digital equity include allowing computer labs access before and after school, working with the public library to provide community access and literacy programs, and partnering with community businesses to get their businesses online. Revere was recognized as one of three winning cities for its student-led effort in the Getting Your Business Online Competition.

In Charlotte-Mecklenburg School District in North Carolina, students are playing a major role in igniting a community-wide effort to provide student access to both computers and broadband outside of the school day. A 12-year-old student initiated this community engagement vision. She quickly and convincingly partnered with parents, the mayor, corporations as well as leaders. E2D, Eliminate the Digital Divide, a nonprofit organization has been formed, and together, their collective impact is making strong headway.

These examples offer great vision and ideas that can be adapted for other communities along with a notable and growing list of others: Coachella Valley, Calif., Chattanooga, Tenn, Provo, Utah, and Beaufort, S.C.

CoSN released the Digital Equity Toolkit in early 2016 to help school leaders and their students get community-based collaborations underway. The kit offers case studies, survey tools, and strategies for establishing partnerships to create collaborative and creative solutions for out-of-school access for students.

Interested in getting your school district and community connected? The Digital Equity Toolkit can help you get under way with four key steps: conducting a survey, engaging your community, ensuring sustainability through community assets, and considering outside-of-the-box solutions.

E-rate focuses only on school and public library connectivity, yet the public-private initiatives of the ConnectHOME, ConnectALL programs and modernization of the Lifeline program are all designed support building an affordable means of home internet access for all. Community-wide efforts are "on the grow" and gaining momentum quickly throughout the country. The Gigabit City movement and the National Digital Inclusion Alliance met in Kansas City last month to share successes and to strategically plan for increased collective impact in the year ahead.

This summer, CoSN, the organization Student Voice, and other partners will launch the National Student Leadership Challenge, encouraging school leaders and their students to take an active role in increasing digital equity within their communities during the 2016–2017 school year. Students make for energetic and knowledgeable partners, and they will be working hard to increase out-of-school access, growing this Future Ready dimension, and narrowing the homework gap within their communities! eSN

Keith Krueger is CEO of the Consortium for School Networking (CoSN).

1 John B. Horrigan, The numbers behind the broadband 'homework gap' (April 2015) http://www.pewresearch.org/fact-tank/2015/04/20/the-numbers-behind-the-broadband-homework-gap/

Waterford SmartStart Helps Get Disadvantaged Children Ready for Kindergarten

Hillsborough County preschoolers have made 'remarkable' gains in literacy and math

Too often, children who grow up in poverty start school well behind their peers academically, putting them at a disadvantage right out of the gate—and they're frequently not able to catch up. But the School District of Hillsborough County, Florida, is using Waterford curriculum to make sure that doesn't happen.

"Our goal is excellence in education, and our superintendent believes that starts in preK," said Head Start Supervisor Evelyn McFadden. "We want to make sure we're doing everything we can to make our students successful."

Through the Head Start program, a delegate to the Board of County Commissioners, Hillsborough County has federally funded preschool programs in 56 of its nearly 200 elementary schools, serving close to 2,000 children from low-income families.

The district had experienced great success in using Waterford Early Learning with its K-2 students, and so McFadden and her colleagues were excited to try the company's preschool curriculum, Waterford SmartStart, with students in the Head Start classrooms as well.

Individualizing instruction

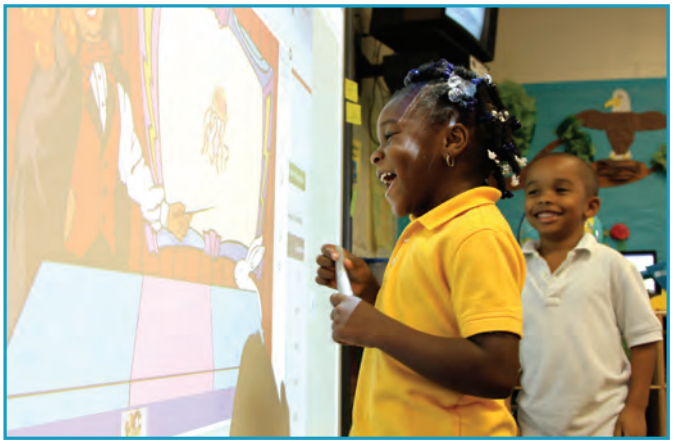
Designed to complement existing curriculum or as a standalone solution, SmartStart includes everything educators need to provide a developmentally-appropriate curriculum for their preK classrooms—including books, hands-on activities, software, professional development, and an app so children can practice their skills outside of school.

The software component is similar to Waterford Early Learning in that it adapts to each child's skill level automatically, giving young children a unique learning experience that is tailored to their own pace and abilities. As the children progress through the engaging songs, activities, and other multimedia lessons, they are learning reading, math, and science skills that target their specific learning needs.

Each of Hillsborough County's 94 Head Start classrooms has at least three computers, and the children use the SmartStart software for 15 minutes per day as part of a station rotation.

The software also generates progress reports for teachers and administrators, so they know which children need extra practice on which sets of skills. Armed with this information, teachers know exactly what they need to focus on in their one-on-one interaction with each child.

"This helps us individualize instruction for all of our children," McFadden said. "In the past, that's something we have struggled with. But Waterford makes it easy."



About a third of the Head Start classrooms also have an interactive whiteboard, and teachers in those classrooms use Waterford's Classroom Advantage activities in their whole group instruction. The interactive curriculum "helps bring lessons to life," McFadden said.

'Remarkable' success

In addition to providing the curriculum materials, Waterford sent representatives to Hillsborough County to train the district's Head Start staff on how to use these tools effectively.

"The quality of the professional development involved will make or break your program," McFadden said, noting that the training her teachers received from Waterford helped ensure their success. "Our staff come in at various levels of proficiency with technology. The professional development we received was more than just that: There were relationships built, and a real rapport with our staff in the classroom."

With help from Waterford SmartStart, children in the district's Head Start program have made significant gains in their phonemic awareness, math, and science skills, setting them up for success in kindergarten and beyond. They also are learning important technology skills that put them on an equal footing with their peers from more affluent households.

"You would not believe the gains we have seen," McFadden said. "To see these preschool children actually reading by May, and parents stopping you and telling you how proud they are of their children—it's a great feeling. We've found a way to advance our students, and we've had remarkable success."

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Sources: National Institute for Early Education Research and U.S. Department of Education

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The 7 questions every new teacher should be able to answer

Teaching for the 21st century looks a lot different. Here's what you need to know for job interviews and beyond

Today's teachers must make sense of data and online communities.

By Alan November

Not long ago, the leadership team of a school district I was working with asked me: "If you were going to hire a new teacher, what would you ask in the interview?" They were concerned that hiring teachers with the right skills now can save a district a lot of money in staff development later. Moreover, they wanted to hire teachers who would be open-minded about changes to come. The problem is to balance the reality of today's pressure for test scores and required teacher evaluation with the changes that can be anticipated during the next two decades.

The traditional skill we valued in teachers when paper was the dominant media—the ability to transfer knowledge of a subject—is becoming less important. Increasingly, a teacher's knowledge can be found online and in various learning styles. As the internet drives down the value of a teacher's knowledge, their ability to personalize learning with resources from around the world will increase. We will have more data generated about our students as we build out our online communities. We will need teachers who understand how to use this data to personalize learning for every student from a vast digital library of learning resources. Also, their ability to teach students to be self-disciplined about how "to learn to learn," is of increasing value. Rather than losing overall value, teachers will be more important than ever.

The big change is not adding technology to the current design of the classroom, but changing the culture of teaching and learning and fundamentally changing the job descriptions of teachers and learners.

I offer seven questions we typically ask of teachers in the interview process, along with corresponding questions I think are geared to align with how the internet will force the redefinition of a teacher's added value:

Current question: **What do you know about your subject?**

New question: **How do you manage your own professional growth?**

We typically hire teachers for what they already know, subject knowledge. But what may become more important is to hire teachers who have a great capacity for continuous learning. *How do you find resources around the world that you can share with your students? How do you continuously learn?*

I would hope that candidates would be able to demonstrate how they follow critical hashtags on Twitter and how they participate in professional communities online, sharing with other teachers from around the world. Or maybe they've taken online courses on their own, from sources such as EDX.org or Coursera.org

Current question: **How do you share what you already know with students?**

New question: **How do you teach students to learn what you don't know?**

A common interview question is to demonstrate a lesson you've created. But at a time when knowledge transfer is less important than learning how to learn, we may need to reframe this question to: *How can you teach students how you learn?*

Increasingly, teachers are going to be in positions where their students will have jumped ahead in the curriculum as they explore YouTube and iTunes U for content in the subject. Increasingly, curious students will come to class asking questions about the subject and the teacher may not know the answer. Teachers can either encourage this spark of curiosity and "awe and wonder," or not.

Current question: **How do you teach students to solve problems?**

New question: **How do you teach students to become problem *designers*?**

With relatively limited access to information in the world of paper, we generally give (maybe spoon feed) students the problems they need to solve. We emphasize finding and memorizing answers. But now that the internet is replacing paper as the go-to media, we need to balance our students' skill sets

from finding answers to asking the most interesting questions.

A seminal moment that jolted me to understand the value of teaching students to ask questions came when I had the chance to spend most of a day with Stephen Wolfram, who invented the computational search engine WolframAlpha, along with his brother, Conrad. He was showing me the remarkable capabilities of this "knowledge engine," which can instantly produce answers (and very often all of the steps) to traditional assignments, such as how to balance a chemical equation or to solve a math problem (even word problems). By the end of the day, it was clear to me that his tool was disruptive to giving students traditional assignments. We would either have to block it to prevent students from finding answers (cheating) or we would have to use it creatively to reach higher levels of creative thinking (teach invention).

I asked Stephan, "What do you think is the most important skill for students to learn, given their access to a knowledge engine?" He immediately said, "The ability to ask good questions. Almost all of the answers to traditional school problems are on the internet—What is not on the internet are the questions."

If I were interviewing a new teacher I would love to hear their answer to "What do you believe are the most important skills to teach your students? I would hope that a successful candidate would answer, "Teaching students how to ask the most interesting questions."

Current question: **How do you assess student work that is handed in to you?**

New question: **What are your expectations for students to self-assess their work and publish it for a wider audience?**

Researcher John Hattie has pored over nearly 1,200 educational studies from around the world to identify the factors that most strongly contribute to student success. Of the 195 independent variables he has identified, self-assessment ranks third on his list.

We need graduates who are independent. Yet in our schools, too often we're fostering a culture of dependency, where kids are waiting for teachers to tell them how well they are doing. In some cases, our system of assessment becomes a ceiling for higher-quality work. Many students will ask, "What do I need to do to get an A?" The rubric for an A can stop students from creating their very best work.

Giving students the tools to self-assess their work helps them develop a sense of autonomy, and research suggests it can lead to deeper self-reflection.

The good news is, we now have more tools to help students self-assess. For example, after a student attempts to solve a math problem or balance an equation, he or she could produce a screencast explaining the thinking behind the answer. So now you're getting students to reflect on their work, instead of just providing the answers. What's more, you could have students go to WolframAlpha, type in the equation, and then compare their work to the steps that WolframAlpha provides. They can reflect on how their own work compares and where they might have gone wrong. This provides deeper insight for both the student and the teacher, and you're also helping students take ownership of the assessment process.

Current question: **What is your contribution to our faculty?**

New question: **What is your global relationship?**

Many schools have formed professional learning communities in which faculty work together to improve instruction. Who can argue against the value of educators sharing best practices and how to help specific students? However, if all these conversations are limited to people you see every day, within the structure of a school, there is a very real danger that an echo chamber will develop that has serious limits to professional growth. There is even a danger of unknowingly perpetuating bad practice.

If you look at research on effective systems, it turns out that systems with some outside influence tend to become stronger over time. But many schools don't really operate this way.

We need educators who value the ideas wherever they can be found. We need teachers who are willing to share their work and seek feedback from colleagues all over the world. For example, my colleague, Kathy Cassidy, first-grade teacher from Moose Jaw, Saskatchewan, seeks ideas from colleagues in Argentina, Italy, and many other countries. She shares student work with these global colleagues and is continuously gaining insights.

Current question: **How do you make sure students are on task?**

New question: **How do you give students an opportunity to contribute purposeful work to others?**

This comes from Dan Pink and others who have written about purpose, and why it's such a motivator for doing our best work. Educators know that all students aren't motivated by grades; achieving a higher grade is an external reward (or punishment) given by someone else—the teacher. By adding a larger purpose to the design of student work, we may be able to have more students who are much more likely to become engaged and self-motivated.

For example, a friend of mine who teaches geometry in Istanbul had her students design the entire geometry curriculum for blind children. This requires a very deep understanding of geometry, because it's challenging to understand physical concepts when you can't visualize them.

My friend had her students visit with children who came to a center for the blind every Saturday, and over time, her students got to know these children well. When I talked to her students, it was clear that designing this curriculum gave them a deep sense of contribution or purpose. They went well beyond the required number of hours. When I asked them why they were spending so much time on the project, they said, "These kids need us. They expect us to come, as do their families. We have to do this work."

Current question: **How do you**

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Flexible

continued from page 1

with brightly colored carpet tiles, lots of glass walls, and stylish furniture that can be moved around easily to create flexible, collaborative workspaces.

Within those spaces, students work in teams to design and build parts for forestry machines, market a college radio station, or launch their own start-up company. To complete these activities, they use the same technologies that professionals in those fields would use to do their jobs.

The school's innovative design supports a more modern learning experience, in which students complete hands-on, collaborative projects. It's a perfect example of active, 21st-century learning, where students are fully engaged in their education rather than just passively listening to lectures.

For instance, in the engineering pathway, students work with engineers from construction equipment manufacturer Caterpillar to design and build parts for machines used in forestry. Students design the parts using AutoCAD, print them with a 3D printer, and when a part meets the engineers' specifications, they use a computer numerical control machine to mill the part out of metal.

"They'll be taking the part from design to actual use," said Director Chris Williams, who serves as the school's principal. "That's what we want students to experience: taking a concept on a piece of paper and turning it into something they can use in the real world."

The school's design plays an important role in supporting this active learning model, right down to the furniture used in its classrooms and work spaces.

THINC's planners wanted tables and chairs that could be moved around easily and arranged in flexible groupings to facilitate student collaboration. They approached a local company, Loy's Office Supplies, which recommended the EDU 2.0, a line of furniture from the manufacturer Bretford.

"A key differentiator was the availability of power supplies in all of Bretford's furniture," said Chad Williams, vice president of Loy's. With these power supplies readily available, students can plug in their digital devices and work comfortably wherever they happen to be sitting.

THINC Academy in Georgia.

THINC students are allowed to use their own laptops, tablets, and smart phones in support of their learning. Throughout its classrooms and common areas, the school contains communal docking stations and tables with video monitors, where students can plug in their devices and share their screens as they work together on projects. Soft, comfortable chairs with built-in power outlets dot common areas and serve as places where students can work independently or in small groups.

Flexibility is key

How classrooms are designed can have a significant effect on how students learn, research suggests—and school leaders can encourage more active and engaged learning with the way their design their learning spaces.

Having flexible seating with readily available power supports many different modes of instruction and makes it easy for students and teachers to transition from whole-group lectures or discussions to small-group activities. Because there will be times when teachers will want to use each of these strategies in their classrooms, flexibility is important when designing learning spaces, says Nancy Van Note Chism, a former education professor at Indiana University.

"A group of learners should be able to move from listening to one speaker … to working in groups … to working independently," she writes in Learning Spaces, a publication from the higher-education technology advocacy group EDUCAUSE. "While specialized places for each kind of activity … can accommodate each kind of work, the flow of activities is often immediate. It makes better sense to construct spaces capable of quick reconfiguration to support different kinds of activities, [using] moveable tables and chairs."

A recent study by the University of Salford in England confirmed that classroom design can have a 25 percent impact, either positive or negative, on a student's progress over the course of an academic year, and flexibility—defined as how easily a classroom's furniture can be rearranged to support a variety of activities—was one of six key environmental factors that showed the most effect.

Arranging classroom furniture in ways that make it easy for students to pair off or work together in small groups not only supports active learning more readily—it also encourages this very behavior among students, while making it more likely that educators will use active learning strategies during instruction.

In a 2012 study at the University of Minnesota, research fellow D. Christopher Brooks observed two sections of a single course taught by the same instructor, with one section meet-

ing in a traditional classroom space and the other meeting in a classroom designed specifically for active learning. He found that both the instructor and the students behaved differently, depending on the type of classroom they were in.

The traditional classroom had rows of tables facing the front of the room, while the active learning classroom was modeled after classrooms from North Carolina State University's SCALE-UP initiative. In these classrooms, students were seated at large round tables that each hold nine students, making it easy for them to break off into groups of three for collaborative work.

Students in the active learning classroom—who had significantly lower ACT scores, on average—overcame the predicted achievement gap to earn the same average grade as their peers in the traditional classroom setting. Even more significantly, how each space was arranged affected the kinds of activities that occurred there, despite the fact that the instructor tried to use the same teaching methods and materials.

For instance, lecturing occurred in 77 percent of the observational periods in the traditional classroom setting and only 55 percent of the periods in the active classroom setting. What's more, class discussions occurred in 48 percent more of the observational periods in the active learning classroom than in the traditional classroom.

Acquiring key 21st-century skills "is enabled or disabled by the physical learning space," said Sean Corcorran, general manager of Steelcase Education. He agreed that the physical environment students learn in can be optimized to support different kinds of activities, such as thinking, making, or sharing.

For sharing ideas, he said, it helps if students have the ability to share digital content or their screen at the simple push of a button. Google Cast could facilitate this by allowing users to project content from any device to a speaker or display using Google Chrome, and Steelcase sells a switching device, called media:scape, that allows a small group of users to project their screens to a shared display.

Design also affects senses and emotions

The design of a classroom not only influences the kinds of learning activities that take place there—it also can have a profound effect on how students feel, which affects their learning.

At the THINC Academy, "the whole space breathes this atmosphere of creativity and excitement," Smith said. "We wanted to give the space a fun vibe that would be stimulating for teens."

Saluda Trail Middle School in Rock Hill, S.C., received a 2015 Active Learning Center grant from Steelcase, which supported the physical transformation of seventh-grade English teacher Julie Marshall's classroom. The rows of static desks and chairs were replaced by brightly colored chairs on wheels and desks that could be grouped into different configurations easily to support more active and collaborative learning.

"We now have brought life into this classroom," Marshall said. "I can roll right up next to [students] and they can roll up next to me [or] to each other. You can feel that bond that's being created in each class. One of my kids said, 'Our classroom is like the family dining room table.' There is incredible engagement."

Many of the school's 850 students live in poverty, and they have been given the message their whole lives that they don't matter, Marshall said. But that changed when their classroom was transformed.

"The first day they walked in, they could not believe what they were seeing," she said. "They had never experienced this kind of environment before. And their first reaction was, 'I cannot believe that somebody cared enough about me to give this to me.' Every day they look forward to getting in the room." eSN

Dennis Pierce is a contributing writer for eSchool News.

A bright future for dark fiber

Dark fiber is helping some districts scale broadband for tomorrow, not today. Is it the future of networking?

Dark fiber upgrades take time, but could save money in the long-term.

By Bridget McCrea

After taking steps to update and increase funding for the E-rate program in 2014, this year the Federal Communications Commission (FCC) began allowing applicants to apply for discounts for dark fiber and self-provisioned fiber.

Seen as a way to give institutions more tools for meeting connectivity demands, these "smart fiber" options are already being used by schools nationwide. With the expanded E-rate opportunities, the number of K-12 districts exploring their dark/self-provisioned options could grow significantly over the next few years.

What is dark fiber?

Self-provisioned options let schools build new fiber networks without using existing fiber optic cables. Schools then own those networks and, as such, are responsible for the related operations and management costs.

According to the Wisconsin Department of Public Instruction, **lit fiber** refers to a leased fiber service that the school does not own or manage. In this common scenario, bandwidth amounts are controlled by the terms of a contract with the service provider (i.e., 100 Mbps for $3,000 per month).

Dark fiber refers to physical fiber that the school owns, leases, or IRUs (indefeasible rights of use, or permanent contractual agreements). The school then "lights" the fiber by connecting its own network equipment to it or by contracting with a third party to provide and configure it. Bandwidth amounts are controlled by the school, and determined by the capacity of the optical network equipment.

Sheryl Abshire, CTO at Calcasieu Parish Public Schools in Lake Charles, La., sees E-rate's expansion to include dark fiber provisioning as yet another way for U.S. schools to compete in the global marketplace. "We have an obligation to meet the growing need for bandwidth and to produce young people who are digitally literate and globally competitive," says Abshire, whose district utilizes leased lines but is exploring its self-provisioning options.

"We have to remember that students in Latrobe, Louisiana, aren't competing against pupils in Houston. They're competing against students in Finland, Germany, Singapore, and Bangladesh, to name just a few," says Abshire. "I've spent considerable time at schools in Asia and Scandinavia, and I can tell you neither has bandwidth problems or spinning rainbows on their [laptop] screens."

Pros and cons of DIY fiber

When the FCC opened the door for K-12 public schools to explore their smart network options, it also put a whole new set of challenges in front of the district that decides to build its own network. To help schools determine the best connectivity approach in an era where 68 percent of district technology leaders say they're struggling with this issue, the Consortium for School Networking and the Berkman Center for Internet & Society at Harvard University developed *Maximizing K-12 Fiber Connectivity Through E-Rate: An Overview*. The toolkit includes an overview of the E-rate program, important considerations for schools as they assess their options, and a call to action for school systems to begin taking measurable steps toward deciding on and making effective use of today's fiber connectivity options.

Abshire sees affordability as one of smart fiber's main attractors for schools. Play by the FCC's rules by creating a request for proposal (RFP), building out the network, and then maintaining it over time, she says, and over a five-year amortization period, the initiative will probably be more cost effective than leasing lines over that same period. "Districts have the chance to think out of the box and maybe even build more bandwidth between schools," says Abshire, who notes that such initiatives aren't for the faint of heart.

"A CTO can't just go out on a limb, develop an RFP, and go through the motions without factoring in ramifications like maintenance, uptime, property rights (e.g., for burying cable)," says Abshire, whose team will take part in CoSN's Teaming for Transformation

project in the spring and visit a district that's already built its own fiber network. "Here at our vast district, I'll have to talk to every community agency and even railroad companies (for running the cable under the trestles) to be able to get the job done. It's a lot of work."

Smart-fiber upgrade

It's been about 13 years since Cypress-Fairbanks Independent School District (CFISD) in Houston began building out its own fiber network. Frankie Jackson, CTO, has been with the district since 2013 and says her team is now in the process of upgrading to a 100G high-capacity network that will support its 128,000 students and staff. The third largest school district in Texas, CFISD is deploying a private optical network leveraging high-capacity networking solutions from Phonoscope LIGHTWAVE, a private fiber-optic network service provider, and Ciena.

The network, which is being funded in part by the E-rate program and designed in accordance with the Smart Education Networks by Design (SEND) Initiative through CoSN, will support the districts bring-your-own-device (BYOD) strategy while improving access to web-based educational resources. Jackson says the smart-fiber upgrade is part of the district's *Mission 2020* plan, which was developed by a 150-member long-range planning committee.

Part of *Mission 2020* focused on creating a high-capacity network that would offer 100 percent system availability on a 24/7/365 basis. "We compare network availability to a utility; you expect it to be on just like you'd expect your water or electricity to be on," Jackson says. To support the district's BYOT initiative, that meant the network would have to accommodate one device per elementary student, two for every junior high school pupil, and three for each high school student. "We plugged the formula into an Excel spreadsheet and factored in teachers' devices, visitor usage, and then district growth over the next 20 years," says Jackson. "Then we said okay, this is what we need to build to accommodate these needs."

Using SEND's guidelines for network design as a framework, Jackson (who participated in the creation of those guidelines) says she enlisted vendors, such as Cisco and Brocade, to help develop the district's upgraded network. Some of the key early steps included segmenting the 200-square-mile district into six hubs (two junior high schools, one service center, and three high schools) and installing dual connections that link data centers to each hub and then out to the respective sites. "We're using dark fiber to connect each of those sites," says Jackson, "and it's running beautifully."

For every self-provisioned network that runs beautifully, there's at least one that requires a little extra elbow grease to build, maintain, and support. In some cases, the challenges surface during RFP creation; others rear their heads during the permitting/permission stage (i.e., running cable under railroad tracks), and still others come once the system is up and running.

For a smart fiber initiative to go as smoothly as possible, Jackson says districts need to avoid the "quick fix" approach to their connectivity problems. "Everyone wants their technology components to work flawlessly 100 percent of the time," she adds, "but they need to spend the time working on the foundation to assure that it can support all of the devices being brought onto the network."

At Bartholomew Consolidated School Corporation (BCSC) in Columbus, Ind., Director of Technology Mike Jamerson says the district has historically relied on a common carrier to provide the district's managed fiber service. The district also has some dark fiber in areas where schools are separated by a street. The latter has been in place for about 15 years in some locations, says Jamerson, who sees permitting and easement permissions as one of the most difficult aspects of installing dark fiber.

"It's pretty easy when you're doing it on your own property," says Jamerson. "When you have to go out any distance or run it under railroad tracks or across waterways, it can get pretty time consuming." Once those issues are addressed, the district also has to register the fiber so that it can be located in the future. And don't forget to factor in long-term maintenance issues and expenses—particularly if you're using aerial fiber.

"When you're using aerial fiber on someone else's poles, there will be rental expenses associated with that strategy," says Jamerson. "And what happens if there's an ice storm? These are all considerations that need to be worked out in advance if you're going to self-provision your own network." eSN

For every self-provisioned network that runs beautifully, there's at least one that requires a little extra elbow grease to build, maintain, and support. In some cases, the challenges surface during RFP creation; others rear their heads during the permitting/permission stage (i.e., running cable under railroad tracks), and still others come once the system is up and running.

Bridget McCrea is a contributing writer for eSchool News.

Carts

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classroom, for example, has come to rely on that cart of fully charged iPads or Chromebooks that's rolled into her classroom at 8 a.m., ready for a full day of tech-based instruction.

Unfortunately, a lot can go wrong between the time those devices were last used and the English teacher's first class. A scheduling argument, a cartload of devices that didn't charge properly, or a logistical snafu that ends with the cart situated clear across campus can all wreak havoc on a seemingly solid technology initiative.

"Myriad challenges can come up when you're trying to manage hundreds of devices across dozens of carts and campuses," said Herb Haubrich, technology director at Waunakee Community School District in Waunakee, Wis. "Just managing the sheer number of devices alone can be daunting, not to mention getting the iPads or Chromebooks out into learning environment and ensuring that they're scheduled, distributed, charged, and then prepped for the next day's use."

Recently, we spoke with three technology directors and one cart vendor, and asked them to share their best practices for iPad and Chromebook cart usage in the K-12 setting—from both the IT and instructional perspectives.

Understand the learning space

Don't just roll a few carts into a school building and hope that they fit well in the learning space. Instead, sit down with teachers and talk to them about how they transition between subjects, activities, and classes. In a blocked scheduling environment, for example, they'll need charging support that goes beyond just a few hours (since multiple teachers will need the carts back-to-back throughout the day). "Understand the environment that instructors are working in," said Rob Dickson, executive director of IMS at Omaha Public Schools in Omaha, Neb., "and then develop a cart strategy based on those requirements."

Build a schedule that works for everyone

When Waunakee CSD brought in 1,200 Chromebooks for grades four to 12 last year, Haubrich's team built out a schedule that allowed teachers to sign out the carts as needed. "We found that only works if teachers play by the rules," he said. For example, some science teachers decided to sign up to use the carts every week for the entire school year. "Our schedule blew up in our faces," said Haubrich, whose team sat down and talked to the teachers about "equity and fairness," and then developed a SQL-based scheduler that it uses to more fairly distribute the carts on campus. Anne McEntire, ed-tech specialist at Easton Independent School District in Easton, Pa., uses Google Calendar to address her district's cart scheduling challenges. At the elementary level, for example, teachers are generally limited to using the carts for just 40 minutes (as noted on the calendar, which everyone can access). At the secondary level, instructors who teach the same class all day need extended access to the carts—an accommodation that's also noted on Google Calendar.

Make the library a central cart hub

Dickson sees the school library as a central hub for media services and digital citizenship. With this in mind, he said, the library can serve as the perfect, centralized location for cart management, storage, and scheduling. "From a logistics standpoint, libraries have become a focal point for schools in this digital age," said Dickson. "If the library can oversee the movement and orchestration of the carts, you can gain a lot of leverage while at the same time enhancing the library's already-important position on the K-12 campus."

Do your homework before buying

Rob Fox, national sales manager at Bretford Manufacturing, said schools should factor in some key considerations before purchasing their carts. For example, the entire dimension of the mobile device—including spacing for the power adapter when plugged into the device—is an important point. Make sure there are external outlets for peripherals (i.e., printers, projectors, access point, laptop on top, etc.), he said, and factor class sizes into your actual plan for deploying/utilizing the mobile devices and carts. "Carts come in a wide variety of capacity sizes," Fox said, "so ensure the capacity size meets the needs of the usage model."

Learn the difference between timer charging and smart charging

Timer charging essentially rotates through power banks in pre-set time increments. Smart charging intelligently measures power demand and delivers power when and where it is needed. Another important differentiator between the two: Timer charging is less expensive than smart charging. When considering which carts to select, "It's important to understand which power management system works best for a school's specific needs," said Fox.

Give teachers and students support in small bites

McEntire avoids overwhelming teachers with dozens of new mobile apps or usage tips for their devices, but she does want to help them get the most out of their cart-based iPads, Chromebooks, and laptops. To achieve this balance, she sends out a short list of app recommendations every Tuesday. "We're a 9,000-student district with limited time for professional development, so it's hard for our teachers to see all of the cool, new, fun apps that are out there," said McEntire, who also works with students in the classroom, showing them how to use larger applications like Google Classroom. "I find that between the information sharing and the time spent in the classroom, we're able to leverage our investment in carts and devices pretty well." eSN

Bridget McCrea is a contributing writer for eSchool News.

What schools can learn from the unschooling movement

By Michael Niehoff

With the onset of the so-called "new economy," much of our educational systems are being questioned. With more than 40 percent of future work being independent contract work, what is the best way to learn or prepare for a career?

Most of us associate learning and career preparation with school. However, learning exists outside the formal constraints of institutions. Whether it's employment (on-the-job training), real world experiences, or travel, we understand that learning can be self-directed.

This realization has led to an increase in what is often called unschooling or even hacked education. Although often associated with homeschooling, unschooling is somewhat different. Homeschooling often uses set curriculum and instructional approaches, whereas true unschooling is directed by the learner.

The approach is unconventional, to be sure, but it recently gained more attention when Tesla/SpaceX founder Elon Musk created a learning alternative for his children embracing unschooling, self-directed learning tenets such as exploration, choice, natural life experiences, and visits to real world learning centers (museums, zoos).

There may now be a growing awareness among some parents, educators, and even students that traditional schools may not, or cannot, meet the individual needs of the learner. At the same time, the approach could hold lessons and implementation strategies for all of us in education.

What is unschooling?

According to many practitioners, unschooling is a learner-centered pedagogy. Learners choose their own path based on interests throughout their natural lives including, but not limited to natural play, household responsibilities, work-based experiences, travel, social interactions, and family.

Unschooling is about one's personal learning journey—operating on the premise that the more personal the learning is, the more impactful it will be. By design, unschooling questions the relevance of standard curriculum and instructional approaches, as well as elements that will often impede learning such as grading. In the end, unschooling practitioners would argue that the self-directed learning approach truly prepares students for the real world instead of a formal education.

An unschooling profile

Matt Powers, a former public school teacher, decided that an unschooling model would be best for his sons. Powers' eldest son has had no formal music training, but can play guitar, piano, and drums proficiently. He also uses Logic as well as Minecraft several times a week while also hunting, cooking, farming, and traveling.

"It's authentic learning," said Powers. "Tests include things like working with a wild horse, learning an instrument, and studying a passion in-depth for years. Because of his unschooling, he's much more confident in his beliefs and personality."

Project-based learning

With the demands of meeting 21st-century educational needs, project-based learning has gained tremendous recent attention as a pedagogical path. In addition to being about solving real world problems and doing public work, PBL also focuses engaging students in owning their learning—an approach similar to unschooling.

High school history teacher Jahmaal Sawyer embraces this approach when he offers his students the opportunity to study what he calls the "History of Anything In U.S. History."

Unschooling goes beyond home school.

According to Sawyer, who teaches at Minarets High School/Minarets Charter High School in the rural foothills of Central California, the U.S. History project was developed in response both creating a project that allowed students high levels of autonomy, as well as to develop a project that sparked student interest.

Sawyer said the focus is on appropriate research skills, accuracy of information, and creating a thesis-driven project on the overall historical significance of the event, person, or item they have chosen.

"As someone who has studied history for many years, I echoed the contempt that many students have today that history doesn't hold a relevant place in their academic life," said Sawyer. "I have very few students who do not accomplish this project successfully, and I attribute that to students having a say in their project."

20Time projects / Genius Hour

Originally based on the corporate culture of Google where employees were given 20 percent of their time to pursue projects of their choice, teachers have evolved the Genius Hour concept into a practice of giving students focused time to pursue ideas of their own volition free from the constraints of grades, standards, and other educational criteria.

Much like unschooling advocates, Genius Hour practitioners believe that if students are given complete autonomy to learn what they want to learn, they

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The simple LMS move that has made our teachers more effective

Migrating to a single platform for assessment, data analysis, and instruction has simplified most everything for one district

By Gary Brantley

Teachers today are responsible for so many things.

They have to plan instruction for all of their classes. They have to tie this instruction to rigorous state and national standards. They have to assess their students' understanding on an ongoing basis, look at what the data say, and adjust their teaching based on the results. They have to differentiate instruction for every child. They have to foster deeper understanding among their students, addressing not only core content standards but also key 21st-century skills such as communication, collaboration, critical thinking, and problem solving.

Teachers can't do all of that if they're constantly logging out of one software system and into another. It's far too much for them to manage.

That's why we at DeKalb County School District—Georgia's third largest school system, with about 103,000 students and 14,000 employees in grades K-12—set out to find a single system that could tie together assessment, data management, and instruction. We wanted our teachers to be able to manage the entire learning cycle through one easy-to-use platform with a single sign-on.

We suspected that having a single platform unifying instruction and assessment would make our teachers more productive—and more likely to use data to drive their instruction. We've found that to be true, while realizing a number of other key benefits as well.

A single platform

Our search process began in early 2015. We wanted representation from a wide range of stakeholder groups, especially those who would be using the system in their classrooms every day. So, we convened an evaluation team that consisted of about 70 teachers, curriculum specialists, principals, and assistant principals, along with another 15 technical personnel.

We invited the companies that Gartner had identified as the top seven providers of learning management system (LMS) software to visit us and tell us about their products, and we set up a "sandbox" environment in which teachers and others could evaluate these systems.

Our evaluation process lasted several weeks. In the end, we chose itslearning as our new learning management platform. Not only did we like the system's functionality, but we also liked how well it integrated with all of our other software programs, such as Infinite Campus, our student information system, and TrueNorthLogic (Performance Matters), our professional development and talent management system.

With this LMS platform, teachers can create, share, and assign lessons to their students; build and deliver a variety of assessments and checks for understanding; track and analyze student progress toward learning goals; and extend their students' learning beyond the school day with rich discussions and activities—all from a single interface.

Delivering SLO assessments

We have been rolling out the LMS platform to our teachers in phases, using a "train the trainer" model. Because we wanted teachers to be invested in the platform right away, we began with a process they were already familiar with: delivering assessments built around Student Learning Objectives (SLOs).

A single platform reduces complexity.

We have pre-loaded existing SLO assessments within the system that teachers can administer electronically to their students, and teachers are able to create their own SLO assessments as well. Teachers use the information they receive back from these assessments to guide their instruction and help close achievement gaps.

Although the data dashboards within the system allow for rich analysis of the assessment results, we have built our own data visualization tools using an analytics program called Tableau that we use to supplement this information. From within the LMS interface, teachers can drill down and see exactly how their students are performing in relation to each standard and learning objective, and they can group students appropriately for small-group instruction or assign personalized content to each child to help fill the gaps in students' learning.

Having access to all of this information in one simple place makes teachers more effective. It's something our teachers are very excited about, because it allows them to be much more productive. But they're also excited about the possibilities for teaching and learning that the platform opens up for them moving forward. These include opportunities to create communities for collaborating across the district; share, rate, and review instructional resources

from a single location; communicate through discussion boards, chat, and video conferencing; have students create electronic portfolios demonstrating their work; and extend their students' learning online.

Extending the learning

Now that every teacher is using the system to deliver SLO assessments and track student progress, we're moving to the next phase of our rollout, which is to use the system for online and blended learning. We currently have about 750 early adopters using the platform to extend learning opportunities for their students online, and our goal is to have all teachers doing this as of August.

Our early adopters are finding that students are using the platform's online discussion tools to connect with each other outside of class, leading to powerful discussions that take their learning deeper. Teachers are finding that students are more likely to open up in this online format; it's a lot easier for them to ask a question or comment on each others' ideas when they don't have to speak up in front of the class.

What's more, the system also gives parents a window into how their children are learning, so they can participate more fully in their children's education. It's leading to greater engagement among both students and their parents.

One of the most common reasons teachers don't use technology to support their instruction is because of the complexity involved, and that includes having to remember multiple passwords and log in and out of various systems all day.

We've imported more than 250 courses into the platform, and teachers and students can access all of their content and all of their data from a single online interface. By adopting a single platform for assessment, data analysis, and instruction, we have reduced complexity and improved the learning return on our ed-tech investment. eSN

Gary Brantley is the chief information officer for Georgia's DeKalb County School District.

7 Questions

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manage your classroom?

New question: **How do you teach students to manage their own learning?**

Traditional teacher evaluation systems often focus the evaluator's observations on the teacher's behavior. Much of this behavior is focused on teaching students to become dependent upon their teachers. Many classrooms are set up to teach students "how to be taught." What we need are teachers who can teach students to "learn how to learn."

In a teacher-centric classroom, students are dependent on the teacher for direction. But compare that to a teacher who has taught her students to be self-directed and collaborative learners. Our society needs people who can figure out ideas from all over the world and manage their own work. This is a really important skill.

Learning how to learn

Notice that there are no interview questions that ask about the candidate's technology skills. While an understanding of technology is essential, these questions revolve around the application of technology to fundamentally change the culture of the classroom.

Collectively, the questions move away from a classroom that is designed to "learn how to be taught" to one that highly values "learning how to learn." In some ways, the teachers we need moving forward are the antitheses to the teacher skills we have been demanding. It will be difficult to avoid the tension that would naturally evolve between the two approaches to managing a classroom.

While disruption of the traditional classroom culture is inevitable, it would be impossible to simply flip a switch to the new one. We will need leaders who understand how to manage the transition. Now is the time to rethink the added value of a teacher in the age of the internet and to redesign our hiring practices to match this new role. eSN

Alan November is senior partner and founder of November Learning. Follow him on Twitter @globalearner.

STEAM

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music. Our students there have a great love of rap music, and they relish the chance to create their own beats and lyrics. These kids are performers who love to get up and present their creations. For them, it's also a confidence builder and a way to prove that they have what is takes to be successful in school.

I've worked with many digital tools that exploit various creative areas but the focus on music has been the kids' favorite. By comparison, I've taught graphic design using online poster-making software based on their class content, but I don't get the same engagement that happens when the medium is music.

An extension, not replacement, of regular lesson plan

Naturally, pen-and-paper lessons are still a key part of the curriculum, but we've found that having lessons like this using music once a week or every other week are crucial. Without effective digital tools, teachers will lose the kids, so tapping into their creativity and interests using music as the medium is a powerful instructional technique. Most people have an innate response to musicality in its many forms, so tapping into the basic response to music makes the learning of content so much more effective. eSN

Jilian Reynolds is digital integration facilitator for Moore County Schools in North Carolina.

Learn

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will not only be more engaged, but also work at levels exceeding standard classroom expectations and processes.

Hacked leadership

In addition to building more personalized learning experiences for students, Illinois Elementary Principal Kathy Melton believes that unschooling can influence how we lead professional development for teachers.

"All of us enjoy learning what we are interested in," said Melton. "Unschooling challenges me to create autonomy for teachers in their professional learning."

When we create systems, said Melton, we could ask if they are a natural response to learning or a contrived system forced upon people.

"The environment in the classroom reflects what environment we create for our teachers," said Melton. "Find out about what people are passionate about and allow them the freedom to maximize that."

Gap Year(s)

Although not a new idea, more and more students are participating in sojourns into unschooling with a Gap Year. Many college-bound students have considered, as well as executed, a year between high school and college dedicated to travel, real world experiences, work experience, and self-directed learning. But it's not just for college-aged students. Ken Durham, a high school principal, is embracing a gap year for his 12-year-old daughter. Instead of attending sixth grade, she will live in Australia with her grandmother who has Parkinson's. She will also travel to Japan and New England while doing things like Lit Trips of the places she visits.

"We want her to explore the world," said Durham. "We don't want her learning to only be from a book, a device, or a classroom." eSN

Michael Niehoff is a former high school principal and the current CTE grant manager for College of the Sequoias in California.

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eSchool News covers the intersection of technology and innovation in education. We focus on how technology can help educators improve learning and deliver instruction more effectively, enhance the student experience, and transform their schools.

eSchool News ISSN: 1098-0814 is produced 4 times a year.

7920 Norfolk Ave., Suite 900 • Bethesda, MD 20814
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The cost for a subscription in the U.S. is $120/year, Mexico or Canada $158/year, all other countries $196/year. Please enclose a bank draft or international money order in U.S. dollars. Back issues of eSchool News are available for $15 each.

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Periodical Postage paid at Bethesda, Md., and at additional mailing offices.

POSTMASTER SEND ADDRESS CHANGES TO
eSchool News, Circulation Department, 7920 Norfolk Ave., Suite 900 Bethesda, MD 20814

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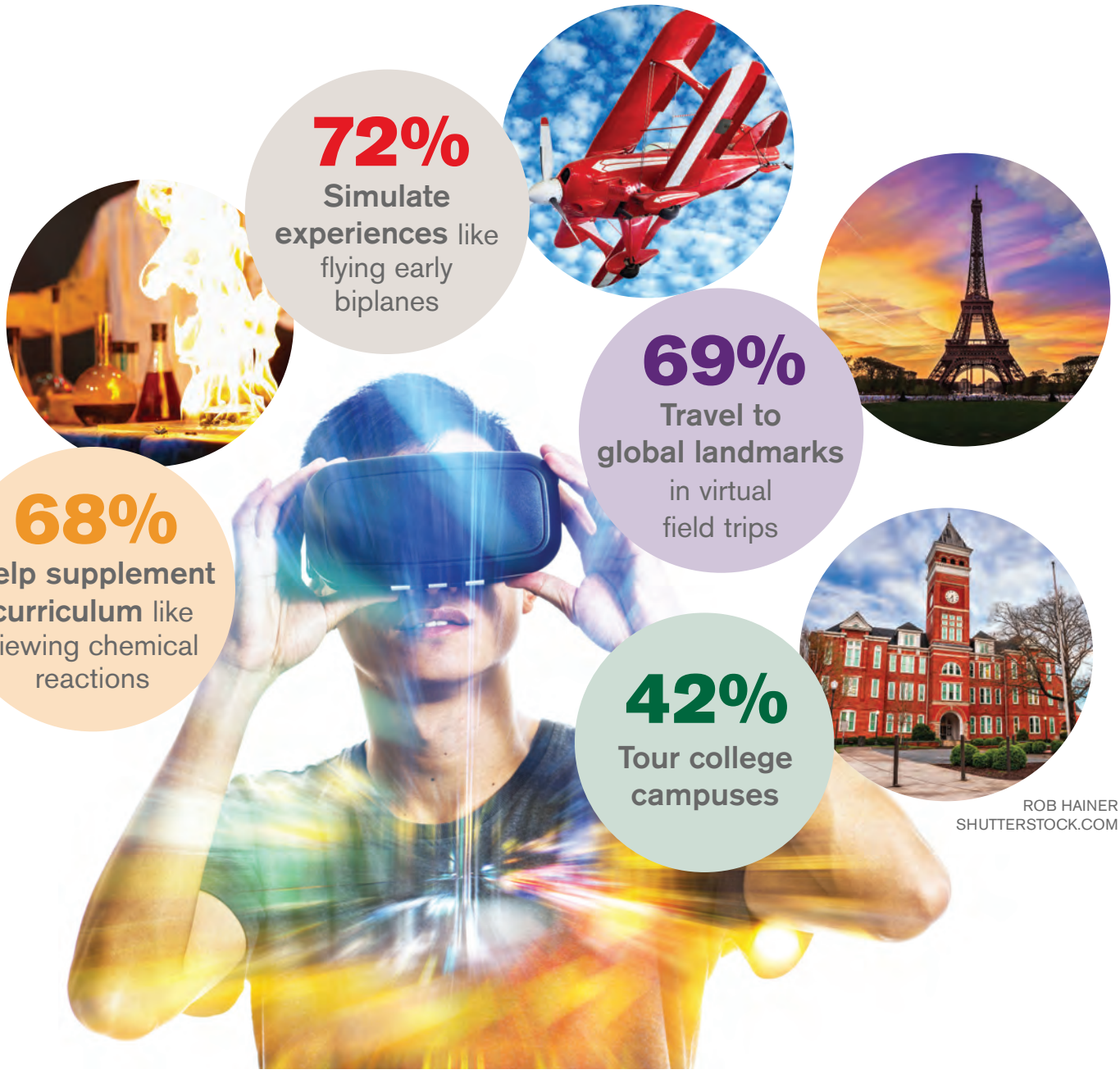
The reality of virtual reality

For many, virtual reality conjures up images of bulky headsets capable of transporting users around the world—or the galaxy. Despite recent advances, its place in the classroom is probably more theoretical than practical. Plenty of teachers would like that to change, though, according to a recent survey of 1,000 K-12 teachers from Samsung, which found an overwhelming majority of participants (83 percent) said virtual reality could have a positive influence on learning outcomes, although only 2 percent have tried it. Here's where the teachers think it holds the most promise:



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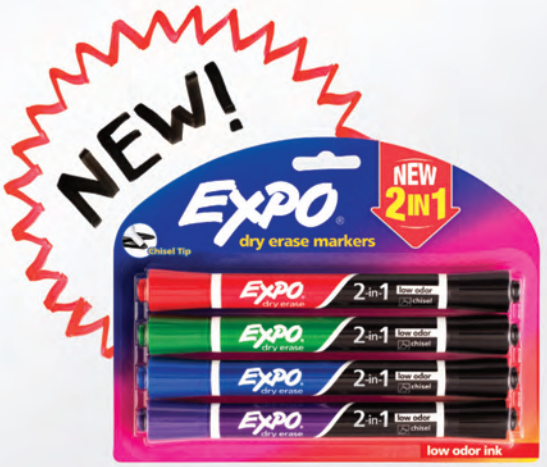

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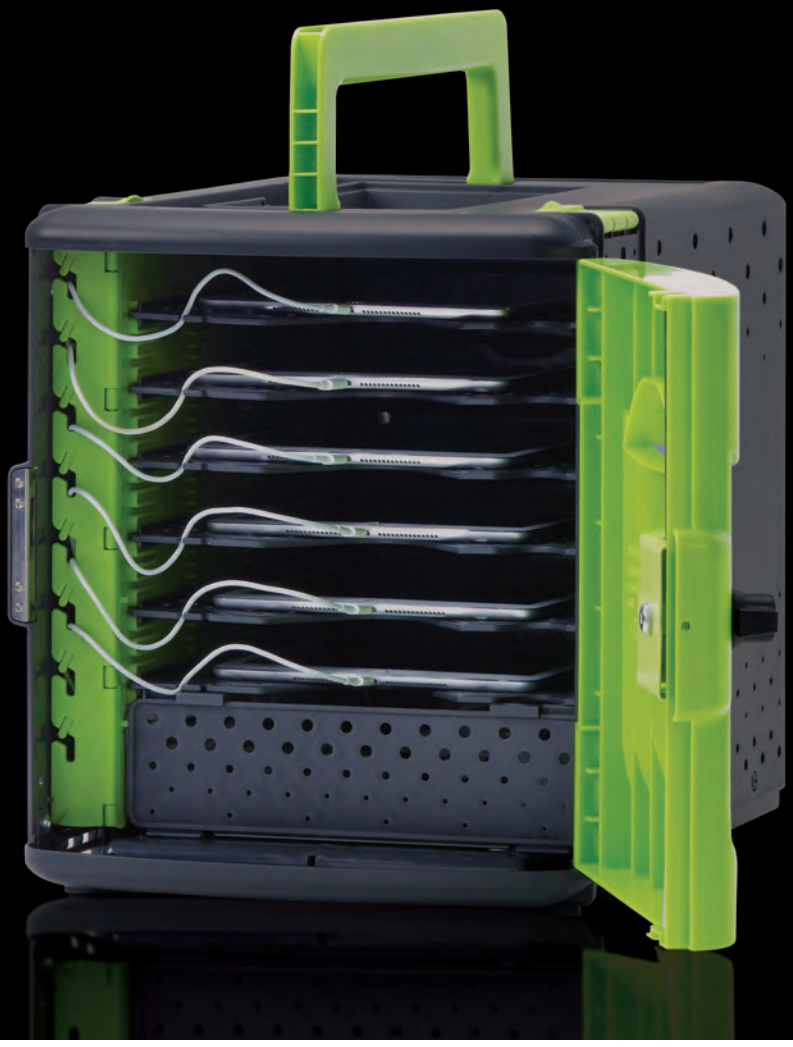

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