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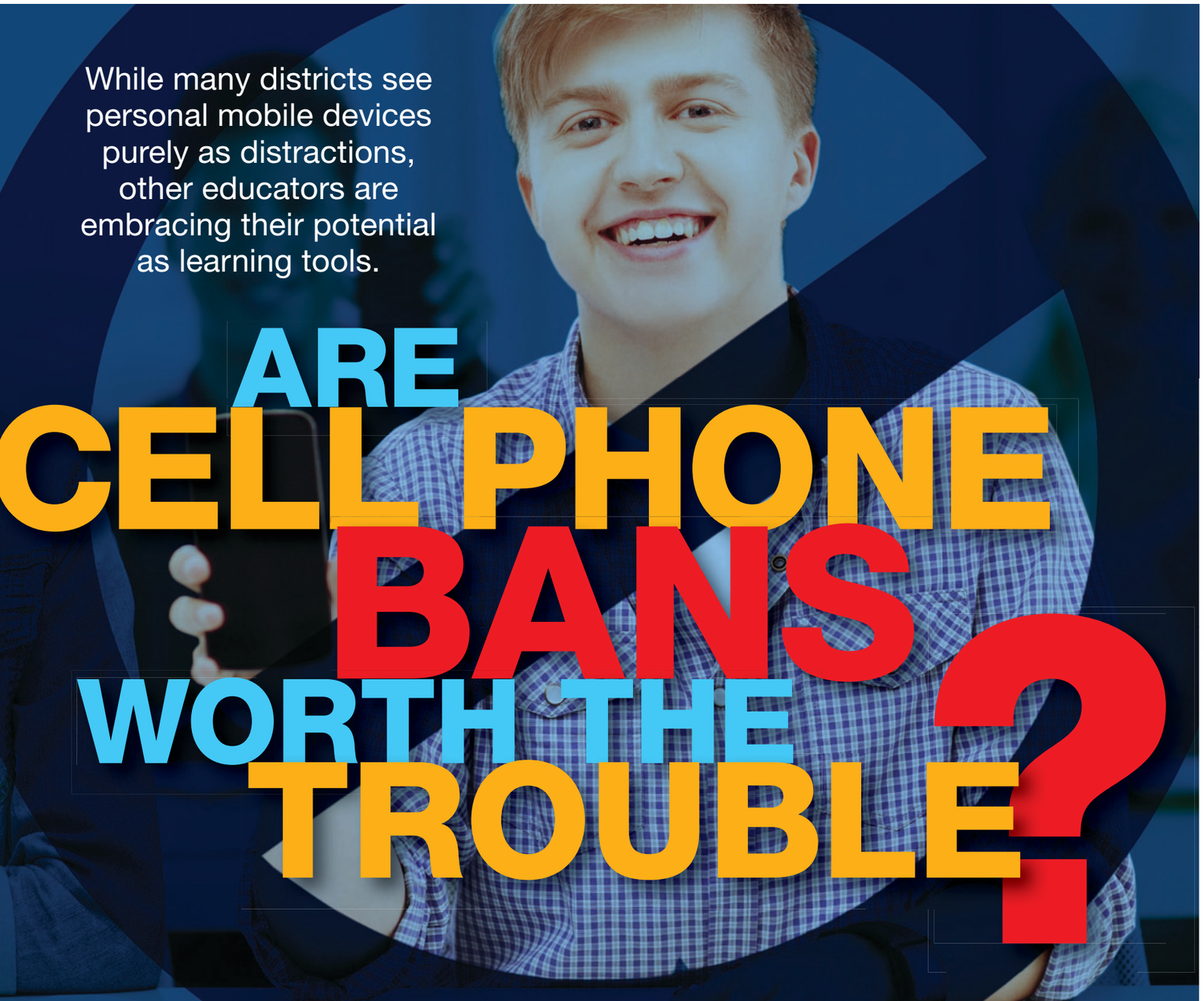
THE JOURNAL

TRANSFORMING EDUCATION THROUGH TECHNOLOGY



While many districts see personal mobile devices purely as distractions, other educators are embracing their potential as learning tools.

ARE CELLPHONE BANS WORTH THE TROUBLE?

September 2014 • Volume 41, No. 9

IN THIS ISSUE

OurSpace

Christopher Piehler, Editor-in-Chief

Districts are dropping phone bans in order to meet students where they are.

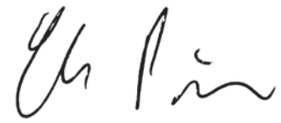
From Phone Bans to BYOD

Devices that were once considered distractions from learning are finding their way into more and more classrooms.

A COUPLE OF years ago, the first and last word in mobile devices for education was "iPad." The Apple tablet's dominance of the ed tech market has been gradually eroded by an armada of Android and Microsoft tablets boasting lower prices, easier enterprise management and integrated access to the Google or Windows cloud ecosystems. These days, though, with districts across the country preparing for online assessments that require keyboards, it's no coincidence that the most-purchased category of device is the notebook, with the Chromebook especially popular.

But the era of one device dominating classrooms is over. Notebooks face competition not only from tablets, but from new categories of devices such as convertible laptop/tablets and phablets, as well as a device that many districts once banned: the smartphone. As our cover story shows, an increasing number of administrators, teachers and parents are giving up on cell phone bans and coming out in support of BYOD. According to Project Tomorrow's most recent Speak Up survey, 60 percent of parents said they would like their children to be in a class where BYOD was allowed. And perhaps more importantly, two-thirds of parents said they would purchase a mobile device for their child to use in class. The same survey shows that a large majority of students in sixth through 12th grades already have access to smartphones.

BYOD achieves two key goals that all ed tech leaders share: controlling spending on devices and meeting students where they are. The former is pretty straightforward, but the latter brings up a couple of questions. First and foremost is the equity issue: What do schools do for the students who don't have devices? Second, does it ultimately help or hurt learning for students to do schoolwork on the same device they use for texting and games? I'd love to hear what you think.



Here & Now

Tech + Online + Industry + Partnership

Phablet Sales to Top Laptops This Year, Tablets in 2015

By Joshua Bolkan

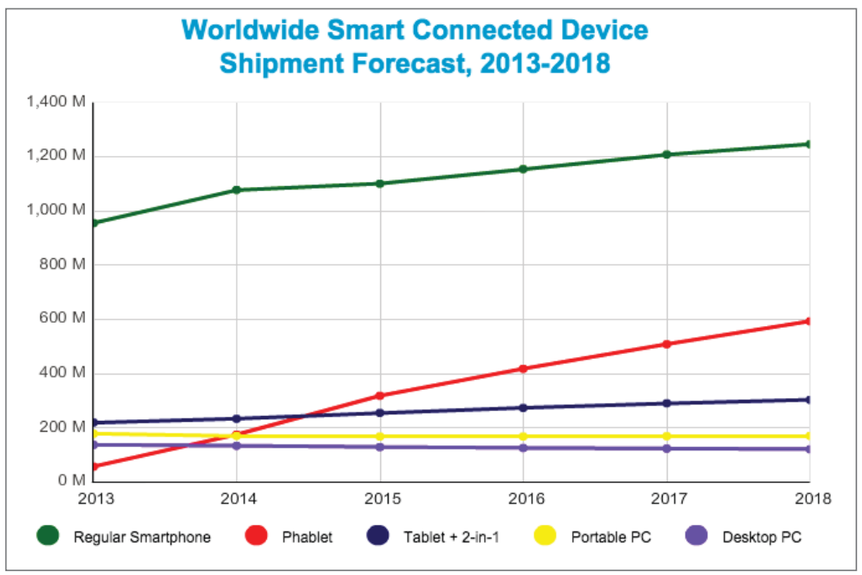
Worldwide sales of phablets — smartphones with screens between 5.5 and 7 inches — will top sales of portable PCs in 2014 and surpass sales of tablets in the next year, according to a new forecast from market research company International Data Corp. (IDC).

The company predicted that 175 million of the large smartphones will be sold this year, topping sales of portable PCs by about 5 million units. IDC predicted that next year 318 million of the devices will be shipped, outperforming the 233 million sales forecast for tablets in 2015 by a significant margin.

Strong growth will continue throughout the forecast period, according to IDC, as phablet shipments increase from 14 percent of smartphone sales in 2014 to 32.2 percent in 2018.

The forecast pointed out that phablets are a relatively new category of device, first picking up volume in 2012, but the pressure that the category has placed on the tablet market has been reflected in slowing growth of demand for 7-inch tablets.

Melissa Chau, senior research manager with IDC's Worldwide Quarterly Mobile Phone Tracker, said, "With Apple expected to join the space in the coming weeks, we anticipate even more attention on phablets as larger screen smartphones become the new norm."



Among smart connected devices, IDC predicts that phablets will capture a 9.8 percent market share this year. That's significantly below the 60.2 percent share regular smartphones will command and trails tablets and 2-in-1 devices, which are set to hold 13 percent of the market each.

Phablets will have a larger market share than portable PCs and desktops in 2014, and by 2018 phablets will narrow the gap with other smartphones, capturing 24.4 percent of the market compared to the smaller devices' 51.2 percent share. *Read the full article.*

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Old People and Young People Can Learn Using Mobile Technologies

PRESS PLAY

In their latest podcast, mobilists Cathie Norris and Elliot Soloway use an example from a dinner party to show that people collecting Social Security use their phones to look for answers just like kids do, and that this is how phones should be used in K-12 education: not as glorified flash cards, but to support inquiry among students.

[webinars]

Microsoft Surface in Education: The World Is Your Classroom

As schools move to schoolwide 1-to-1 computing, standardization of technology and devices is key to ensuring adequate compatibility, support, security and management for all students and educators. Surface and Windows 8 provide the foundation for a consistent, controlled and protected environment. Download this white paper to learn how your students create and engage anytime, anywhere.

New and archived webinars are available at thejournal.com.

[industry update]

Common Core Contracts Focus on Teaching Materials and PD

A recent study has found that the bulk of the contract bids related to Common Core work put out in 2012 and 2013 were generated by districts in 11 of the 45 states that were committed to implementing the state standards. These states issued 10 or more contracts for projects. The high rollers were California districts, which advertised 109 contracts during that period, and New York, which had 73.

The median size of contracts was $35,205; however, the overall average was nearly $375,200, owing to the impact of a few very large contracts that ran over $1 million each.

For example, **Baltimore County Public Schools** awarded a contract worth $5.4 million to edCount to assist in the development of a "world-class elementary curriculum that complies with Common Core." Baltimore also gave a $4 million, five-year contract to Pearson to provide instructional resources for grades 1 and 2. **Shawnee Mission School District** (KS) issued a $2.2 million contract to McGraw-Hill Education for use of the "Reading Wonders" series.

These findings were shared in a recent research report from Onvia, a company that sells access to a database of state and local government contracting activity. Onvia researcher Paul Irby searched the database specifically for terms related to the Common Core.

The predominant types of projects have focused on instructional materials and professional development, two of the categories cited in a 2012 Fordham Institute study that examined the cost of implementing the standards. Testing showed up in just a "few" contracts in the database, suggesting, wrote Irby, that the vast majority of those contracts are going to the two online testing consortia, PARCC and Smarter Balanced. *Read the full article.*

Here & Now

{win big!}

Classes With Best Music Videos to Win $185,000 in Technology

Compass Learning will give $185,000 worth of technology to three classrooms that create the best music videos about the value of ed tech. The videos should describe how technology can enhance the learning experience in the classroom. A panel of judges and the public will consider the submissions in three grade levels.

Winners will get an entire classroom technology makeover that will include:

- Compass Learning's learning acceleration software, along with the necessary professional development services;
- Education elements that include Launchpad and virtual Launchpad training;
- Smartboards and projectors; and
- All the necessary licenses and subscriptions for one year.

Each entry should be a music video that includes a song, or the parody of an existing song, written by and performed by the class and teacher.

The song or parody should demonstrate or envision the use of technology in the classroom and mention Compass Learning at least once. Videos should not exceed 2½ minutes in length and the teacher is encouraged to be in the video along with the students. To enter the Compass Learning Classroom Refresh Contest, click here. *Read the full article.*

Product Roundup

Interactive Whiteboard Apps and More

The latest hardware, software and services

Scoodle Jam is a free tool that lets students work creatively on any subject. The built-in Common Core-aligned projects, graphic organizer templates, whiteboard and guided sticker visuals support collaboration, imagination, critical thinking and communication. *Read the full Graphite review.*

Doceri is a free app that allows users to add a variety of backgrounds and multiple recordings to a single presentation. Teachers in wireless classrooms can use iPads to connect to desktops and remotely control projections. *Read the full Graphite review.*

With the free presentation app Educreations, educators can use prerecorded audio, images, photos and fun colors to help highlight points. Teachers can invite students to lessons via a link in an e-mail, a blog post, a tweet or a post on Facebook. *Read the full Graphite review.*

ShowMe Interactive Whiteboard ($4.99 for the group version) allows teachers and students to create and record shareable presentations called "ShowMes." ShowMes can include text, images, live drawings and voiceover recordings. *Read the full Graphite review.*

Rainforest Journey is a subscription-based online curriculum that uses the rainforest to teach K-5 science. It uses photos and videos that correlate with written text to illustrate concepts such as adaptation, the water and life cycles, predators and prey. *Read the full article.*

Part Facebook, part e-portfolio, MyMozaic connects graduating high schoolers with college and career recruiters, letting students create shareable multimedia portfolios. The first 5,000 individuals and organizations that sign up can get a free lifetime membership. *Read the full article.*

newsreleases

AV & Presentation

- NEC's DisplayNote Software Now Available in the Cloud
- New BenQ Projector Supports BYOD
- Lightspeed Updates Mobile Manager for Windows 8.1
- Mimio Rolls Out Interactive Displays, Upgrades MimioStudio and MimioMobile

Infrastructure & Facilities

- Red Hat Releases Enterprise Linux 7
- Aleratec Introduces New Charge/Sync Cabinet

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- Free iPad App Lets Teachers Give Quic[illegible]ack
- iTunes U Updated With iPad Tools for [illegible]and Students
- CTL Rolling Out Ruggedized Education Ch[illegible]book
- Panasonic Debuts 2-in-1 Mobile Device for K-12, Connected Classroom PD Resources

Teaching & Learning

- Airwolf Rolls Out Expandable Entry-Level 3D Printer for Education
- Google's Free LMS 'Classroom' Goes Live
- Kurzweil 3000-firefly Literacy Software Adds Tools for Struggling Learners
- Filament Launches Game-Based Science Curriculum

On Sept. 25 at 4 PM ET, learn more about Nesloney's innovative use of technology in an edWeb.net webinar hosted by *THE Journal*'s Christopher Piehler.

INNOVATOR

TODD NESLONEY, PRINCIPAL
NAVASOTA INTERMEDIATE SCHOOL, NAVASOTA, TX

After seven years as a fifth-grade teacher in Waller, TX, Todd Nesloney was recruited to head an underperforming school that was being reconstituted by the **Navasota Independent School District**. For his first year at the fourth- and fifth-grade campus, Nesloney hired a completely new staff and adopted an entirely project-based learning approach. Here's how he plans to make it work.

>> *THE Journal*: What appealed to you about the opportunity to become a principal?

Todd Nesloney: I've had my master's and principal certification for four years, but had no interest in using it. I loved being in the classroom. But Navasota sought me out based on my Twitter and blog, which was really humbling. They knew I loved project-based learning, and they were offering me a school where I would be in charge of helping teachers do that for an entire campus, along with hiring my entire staff. That's a dream job: to create your own school.

>> *THE Journal*: How did you come to embrace the flipped classroom and project-based learning?

Nesloney: I had taught for five years and had great test scores. But I hated what I was doing, because all I really knew was how to teach test strategies and pass out worksheets. Then a co-worker came to me and said I should check out the flipped classroom. I researched it, went to a webinar and fell in love with the idea. I started implementing it the next year … only to find out that when I implemented just the flipped classroom, the only difference was that I was now making videos introducing the material that they could watch at home. So I brought project-based learning in with the flip. That allowed me to have kids watch the videos and then come to a classroom where we were completely hands-on.

>> *THE Journal*: What would be an example of a successful project-based learning activity in your class?

Nesloney: The kids didn't like the school lunch menu, so we looked at the U.S. Department of Agriculture's preapproved lunch recipes that are online, and each group got to pick an entrée, two sides and a dessert. They took those recipes, which also had the nutritional facts attached, and had to figure out the calories and the fats for their meal. The recipes were designed in 50 servings, so they had to take the measurements and decrease them to 25 servings or triple them to 150 servings, converting the fractions to determine how much of each ingredient they would need. Then they created a presentation in which they made the case to the district's food service department to put these items on the menu. Kids are entering a world that is full of collaboration and figuring things out. We have to be modeling that in our classrooms through projects like these.

>> *THE Journal*: You said you were approached about being a principal after catching the district's attention through your blogging and Twitter activity. How have these activities enhanced your work?

Nesloney: My first year of blogging, I blogged every week about exactly what I was doing in class. Since

MY TOP 3

Nesloney shares his tips for flipping the classroom.

then I've been writing more on my ideas about education. My Twitter account is about connecting with other educators and learning what I can from them. I'm only as good as the people I surround myself with, and social media allows me to surround myself with the best in the world. Having those conversations and building those relationships has changed my career. Several people I ended up hiring heard about the job because of social media, or accepted because of what they've seen me do on social media.

>> *THE Journal*: Social media was also responsible for a major expansion of your online summer learning series, right?

Nesloney: Yes! I wanted to get my staff learning before we even came together, so I decided to do an optional summer learning series, where every Friday I'd send out some challenges. The first one was all about getting your Twitter account set up and the value of using social media as an educator. Some people outside my staff found out about it and I was encouraged to write a blog post, and within six days we had 1,500 people from seven different countries signed up to participate. Since then I've utilized my connections on social media to have people from around the world create the challenges, for not only my staff but for all of the people participating.

>> *THE Journal*: How will you know whether your first year as a principal has been successful?

Nesloney: The biggest issue that this campus has coming in is a culture issue. We take the state test in April, and you're not going to hear me mention it except for the day we have to take it. I'm more focused on getting those kids to know that they are wanted here, that they have a voice and that we care about them on a deeper level. If they love coming to school, I'll know we've been successful. the

David Thornburg

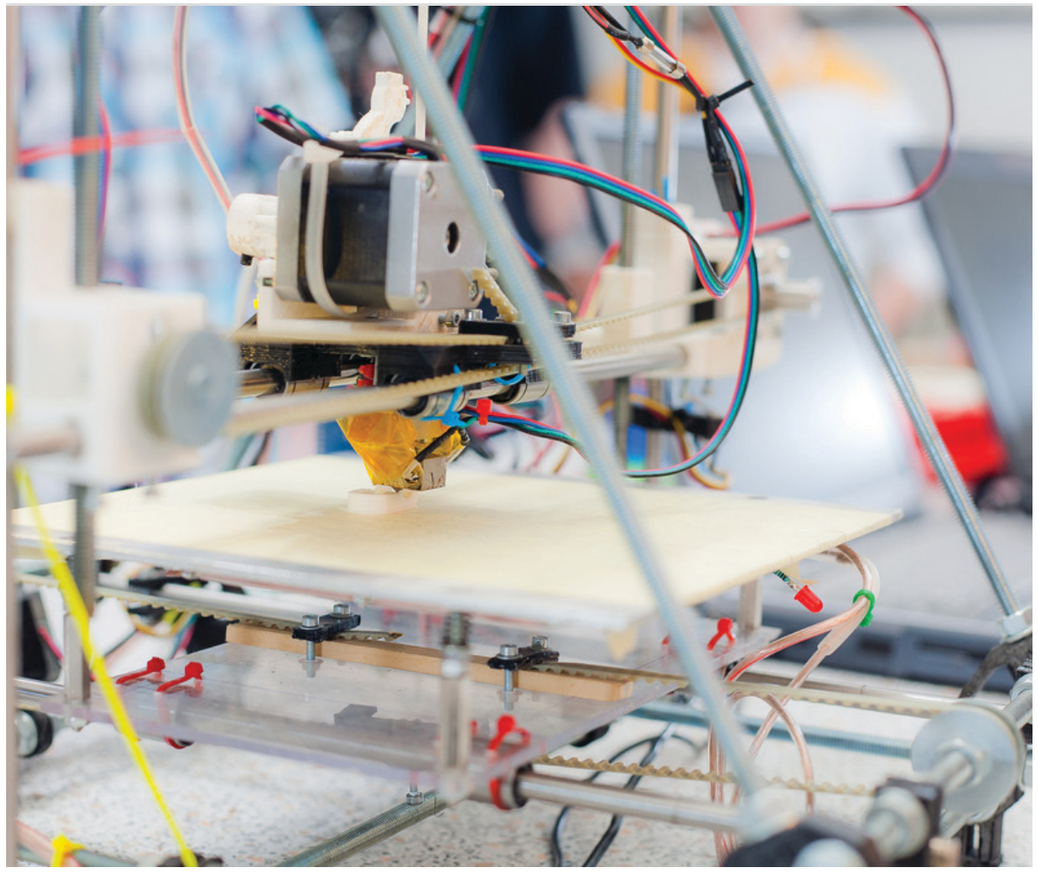
7 Hands-On Projects That Use 3D Printers

Our expert takes you beyond the wow factor to explore how 3D printing can help teach a range of subjects.

3D printing dates to the 1990s. The earliest 3D printers were designed for rapid prototyping for industry. They were very accurate and very expensive. Early companies like Stratasys have a great reputation in the industry for making machines that are used in commercial and high-end educational (largely college) environments. If this was where the technology had stopped, we wouldn't be talking about 3D printers in K-12 schools today.

The big change happened around 2008, when the RepRap project resulted in open-source designs that allowed anyone to build their own self-replicating 3D printer. These primitive systems could be built for a few hundred dollars, which opened the market to hobbyists who wanted their own printers. Since that time, inexpensive, fully assembled printers have come to the market that have expanded the user base beyond hobbyists to include schools.

There are currently more than 100 3D printers on the market that might be appropriate for educational uses. With a list this long to choose from, the challenge of finding the right printer for your district can be daunting. Printers range widely in price, and some inexpensive printers are as good as some of the more expensive models. (See the sidebar on page 11 for some buying tips that might be helpful.)



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Teaching in 3D

The fact is that I'd be hard-pressed to think of an academic subject that can't be enhanced by the use of 3D printers. Of course, the easy (and obvious) subjects like physics, math and engineering come to mind. With all the current talk about STEM education, inexpensive and reliable 3D printers have hit the market at the perfect time. But there are many other subjects that can be taught with 3D printers.

Fine arts: My 7-year-old granddaughter was visiting recently, and I thought she might enjoy making decorative ceramic tiles using her own designs. You can

see a short video of the process here. I helped her use the free TurtleArt software to create a geometrical pattern to her specifications. We then printed the pattern on a plastic stamp that could be pressed into wet clay to leave behind a design. We baked the clay and my granddaughter painted the tiles. I can think of many art projects that use 3D printers, some of which you can find in *The Invent to Learn Guide to 3D Printing in the Classroom*, a book I co-authored.

Literature: Suppose a student reads a book. She can build a model of one of the scenes from the book using characters and settings that she designed and printed herself. Finished parts can be painted with acrylic paint — an important detail, because most 3D printers only work with one color of plastic per part.

History: Imagine the insights students can get into the society of the ancient Greeks when they design and build models of temples like the Parthenon. In the course of this project, students would likely learn about the Golden Mean and its appearance in classical architecture.

Math: Teachers have historically been huge fans of manipulatives that make abstract math concepts real to many kids. When it comes to tangram sets; pattern blocks; or other mathematical shapes, games and objects, 3D printing can help. Some manipulatives can be bought at teacher supply stores for a low price, but there are many others that can't be bought — but that can be easily made.

For example, a tabletop can be tiled (covered with no gaps) by triangles, squares and hexagons. These shapes are normal parts of pattern block sets. Regular pentagons (those that have five equal sides and angles), though, can't tile a surface by themselves. Rather than take this fact on faith, students can explore why it is true using tiles that they have built themselves.

Physics: Students can develop a hands-on understanding of simple machines by using basic systems to make more elaborate constructions. For example, a student could start with a simple machine like a lever to design a catapult to throw a jelly bean across the room. Students can make and discuss different designs in class, and lessons can highlight the use of the catapult throughout history.

Another example of a machine to build is a car that moves with a fan blade. Students can experiment with

the size of the fan, the kinds of bearing they use for the wheels, and other factors to make the car faster.

Chemistry: Students can use a 3D printer to build molecular models that they can then take home and explore in detail. For example, making models of atoms that snap together to form molecules is a project an entire class can work on. It involves a lot of basic design, and an understanding of the angles at which various bonds take place.

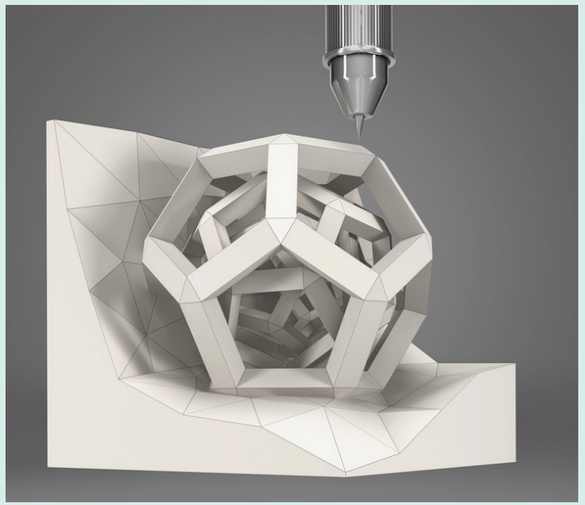
Engineering: Now that the Next Generation Science Standards have been released, engineering is a K-12 subject. By tinkering with 3D printing, students can explore the iterative way in which objects are designed. When kids build robots from scratch, for example, they may need specialized parts (such as gears). Using a tool like Inkscape, they can design and print any kind of gear they want.

The fact is that 3D printing cuts across the curriculum, and 3D printers stir enthusiasm in both teachers and students, who get to see their ideas become tangible objects before their eyes. I envision a time when 3D printers are as common in classrooms as computers. the

David D. Thornburg has worked in the field of educational technology since 1981. He co-founded the Knights of Knowledge, where he creates short videos that provide a driving question to trigger student research on a topic. He also conducts workshops for schools and districts on implementation of the Next Generation Science Standards.

CHOOSING THE RIGHT 3D PRINTER

As of this writing, highly rated printers now shipping include the MakerBots, the Afinia H480 printer and a new entry at the low end: the da Vinci 1.0 from XYZ Printing. These are just three choices from a long list. Rather than promote a specific printer, though, I will mention some factors that I think are worth considering:



- Heated build plate
- Printer speed
- Automatic alignment
- Raftless printing
- Maximum build size

Except for the heated build plate, you may trade off some features for others based on what is important to you. The heated build plate is important because the plastic shrinks as it cools down, and you don't want the part lifting off of the plate while it is being built.

Personally, I like printers that automate the alignment process, since this is critical to getting well-built parts from your system. Printer speed, maximum build size and the ability to print without a "raft" (a base plastic layer that needs to be removed after the part is finished) are options that you can take or leave.

Price is not on the list because you need to decide what is appropriate for your budget. Printer reliability is a more important factor to consider, so look at the manufacturer's warranty closely before making your investment.

If you're still hesitant about buying a printer, one company, 3D Parts Manufacturing, is leasing printers to schools. The lease covers everything from filament to any service your printer might need.

NEXT:
Are cell phone bans worth the trouble?

ARE CELL PHONE BANS WORTH THE TROUBLE?

While many districts see personal mobile devices purely as distractions, other educators are embracing their potential as learning tools. **By Dian Schaffhauser**

A YEAR AGO, cell phones weren't permitted in **Garland Independent School District** (TX) buildings during the school day. The first time a principal or teacher caught a student with a phone, the student could pay $15 to get it back or talk a parent into coming and picking it up. The second time, there was no choice: The parent *had* to pick up the phone *and* pay the fine. Garland was not alone in frowning on phones. According to a 2013 Project Tomorrow survey, 32 percent of districts had policies prohibiting the use of personal mobile devices by students. That same survey, though, showed that attitudes were shifting. In 2010, 25 percent of principals said they were likely to allow or already allowed students to use personal mobile devices in school; in 2013 the number was 51 percent.

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Over time, Garland's executive director of technology Jim Hysaw came to agree with the 51 percent. Why? Because he faced the stark reality that his district couldn't keep students from using their cell phones at school — even if it wanted to. So, like districts across the country, Garland had to answer the question: Would it adapt or would it continue to fight a losing battle? That question led to more (and more difficult) questions: If you're ready to lift the ban on student devices on your campus, how do you do it and what will the consequences be?

Teaching Responsible Use

Alice Owen can't believe anybody is still debating the use of technology such as phones in schools. In her former job as head of technology for **Irving Independent School District** (TX), Owen saw at first hand just how many students brought cell phones to school, despite a longtime ban that called for phone confiscation and fines. She also saw how much time was wasted trying "to discipline all the kids all the time."

Owen, who is now the executive director of the Texas K12 CTO Council for the Consortium for School Networking (CoSN), said that, in the face of ubiquitous cell phones, the district convened a committee of administrators, who also got input from parents, students and teachers. "We talked about letting kids bring them, and they could certainly use them in passing periods and before and after school and in the lunch room."

When it came to classroom use, the phone decision was left up to the teacher. The high school had a 1-to-1 program going on, and when students forgot their laptops, teachers often allowed students to use phones as substitutes. According to Owen, some instructors embraced phone usage; others didn't. At least one teacher tried a group project: Students from different classes were put into teams and "forced" to collaborate via their phones

or laptops. This collaboration included texting with their partners in class. "By legitimizing that or giving a purposeful reason to text a person, then the kids are [learning] responsible use," Owen said. On the flip side, teachers "really need to set clear expectations of appropriate use up front, just like the rules in your classroom. And I think most kids will abide by them if they know what the rules are."

Owen believes that the district's policy has been a success. "It freed up the administrators from being so punitive about it all the time," she said, "when we really needed to be teaching kids how to be responsible with the tools they're going to learn to use as adults."

At the private **Westwood Schools** in Camilla, GA, where "Cool Cat Teacher" Vicki Davis teaches and serves as IT director, a BYOD policy is coupled with a strict device rule: A student's phone must be off from the moment he or she enters the building until the moment a teacher asks for it to be used in a class. Scofflaw phones are put in "detention" for five days. "We have four in detention right now," she declared.

The restrictions are designed to help kids remember that their job is to be a "professional student," Davis said. "I've found, in my own experience, if they start the school day in a school frame of mind, then they're going to be in a school frame of mind. If they start the school day playing games or doing something off task, that's another thing."

Davis cites work by researchers such as Gloria Mark, a professor at the University of California, Irvine, who has found that once a person is distracted, it can take something like 23 minutes to get him or her back on track. Davis added, "You can't control when people text you. Your pocket vibrates and you just want to look at it. That gets you off task." The best approach, she believes, is to "make friends" with cell phones and help students learn how to integrate them into life.

Testing Your Network With a Secret Pilot

According to Hysaw, the only reason the Garland ban lasted so long was because the network infrastructure couldn't handle BYOD. The district has never had full funding for a wireless network, so it has built its capacity piecemeal. Over the years, Garland schools have gone from putting access points down the hallways to placing one AP for every four classrooms, then "slowly but surely" moving to one AP per two classrooms. Hysaw added that the cell phone ban was always a campus-based decision, and most principals never really enforced it.

Last year, with support from school principals, the IT department decided to test how well the district's WiFi could support student device usage, so Hysaw opened up the network without telling students. One day a new guest network just appeared on students' phones. Of course they logged onto it, and when one student posted news of his discovery on a social media site, the usage abruptly doubled. By March of this year, the guest network was averaging 13,000 to 14,000 users, out of a student population of about 58,000. "We really had a yearlong pilot," Hysaw laughed. "The kids got onto the network, and we tracked the usage. It didn't overwhelm what we were doing."

Only two problems really surfaced during the pilot. One was students building their own private hotspots with their phones and choosing names for them that weren't publicly acceptable. Whenever IT came across

WHO'S ON THE PHONE?

According to a survey published in Project Tomorrow's "The New Digital Learning Playbook," the following students have personal access to cell phones:

- 89% of high schoolers
- 73% of middle schoolers
- 50% of elementary students in grades 3 to 5
- 21% of elementary students in grades K-2

an inappropriately named hotspot, they'd simply shut it down, not even bothering to say anything to the offender. After all, the guest network was still supposed to be a secret.

The other difficulty occurred during an online testing pilot at the district. Hysaw said, "The kids were just slamming the wireless network, so we had to choke down the bandwidth to make it work just okay. That way we could let the testing go on." When the testing was over, the network was restored.

Overall, Hysaw saw very little misuse, so he feels "pretty good" about the pilot. He uses Cisco Identity Services Engine to authenticate and define network access. Only staff, faculty, students or BYOD students are allowed access to the filtered Internet, which is managed with ContentKeeper so that the district is compliant with CIPA regulations.

Now that the board of trustees has approved new BYOD guidelines, Hysaw can come clean about his experiment. Even so, he has no intention of encouraging students to use their cell phones at school. He is leaving that decision up to the curriculum department, principals and teachers. Meanwhile, he is planning for the day when the district puts a 1-to-1 program in place. "I'm the construction team," he said. "I built the road, I set the speed limit. I built a whole bunch of lanes. I don't have quite enough lanes for 1-to-1, but I have enough lanes to keep us going until we make the decision."

Should an upcoming bond issue pass, Hysaw confirms that he's ready to add more lanes to Garland's bandwidth highway. "If you can build the infrastructure, and you can be device-agnostic, then you just need to get with the teachers, get with the principals, and let them tell you they're either ready for it or not," he said. "And when they're ready, then you need to be."

Letting Teachers Decide

According to its official policy, **Academy School District 20** (CO)

allows its students to carry "electronic communication devices" as long as they're approved by the school's principal and are turned off and put away during class time. In reality, the district pretty much leaves it up to the teachers to decide whether phones can be out during class. Philip McIntosh, a seventh-grade science teacher at **Challenger Middle School**, said, "We're encouraged to use technology wisely." Students get a lot of practice with mobile devices, since the school's 1-to-1 program gives them access to iPads in school and at home.

McIntosh said that the "vast majority" of teachers at his school have a no cell phone policy, but his team had been "pretty lax" because they wanted to give the kids some freedom. But last year, he said, "We just got tired of trying to monitor it. They're so attached to those devices, it got to the point where they felt like it was their right and privilege to do whatever they wanted with it at any time, without any respect for what anybody else thought they should be doing."

After four or five interruptions caused by the phones during every class session, McIntosh realized the quickest solution was to ban phones in class. "And," he marveled, "all the problems were solved." (Students can still use their phones as much as they like in the halls and during lunch.)

When the ban was put in place, "there was some minor grumbling, but not nearly so much as you might expect," McIntosh recalled. He blogged about the decision and "never heard anybody saying it's a bad idea." In fact, some students even thanked the teachers for banning phones. "If they were working in a group with someone else that had a personal device," he explained, "instead

3 TIPS FOR TEACHING WITH CELL PHONES

Connect Via WiFi: On the first day of school, Vicki Davis has her class play a game with Kahoot! or Socrative, which requires students to connect their devices to the school's network. That way, she can make sure they're not using data from their families' plans or spending money they don't need to spend. When students are on the network, they're behind the school firewall so their surfing is filtered.

Work the Room: Davis said classroom management is crucial to managing cell phones. That requires having the "language in place" to handle each aspect of usage: "This is what I'm going to say when they get them out. This is what I am going to say when they turn them on. This is what I'm going to do if I catch them off task...." And since students do go astray, she likes to have them all facing outward in a circle so she can stand at one point inside the ring and see all of their screens at one time. Then, she added, "You have to very quickly catch it the moment somebody is off task and deal with it."

Mind the Sign: Although middle school science teacher Philip McIntosh banned cell phones from class this year, for the new school year he's trying something different that will actually be in place for all mobile devices, whether they're student-owned phones or school-issued iPads. Over the summer, he built four portable traffic lights for himself and his three team teachers. Now, when a student walks into class, the teacher will have a warm-up exercise posted on the board. If the traffic light is red, "then make sure no one sees your personal device." An amber light means that the device may come in handy but it's not necessary. If the light is green, the teacher expects the student to use his or her device in order to complete an assignment.

of being part of the group, they'd stop every three minutes and check their Twitter feed instead of being actively focused on what we were trying to do in class."

McIntosh has only had two students defy the ban. In both instances, he said, "I took the phone away for the rest of the day and they came and picked it up on their way home after school. And I said, 'If it happens again, you have to go to the principal to receive it. If it happens again after that, your parent has to go pick it up from the office.' It never really gets that far."

While McIntosh is relieved that the ban has made his students less distracted, he sounded wistful, too. "It's no fun to constantly be hassling people about their cell phones," he said. "There's no joy in it."

Setting Goals and Refurbishing Your Teaching

Julie Evans, the CEO of Project Tomorrow, has spent her career consulting with school districts about their use of technology in the classroom, and she has learned two major lessons about device initiatives. First, there has to be a "very clear understanding" of what's to be derived from the use of devices. "I see way, way too many times where districts are making big investments on the devices or walking down the road of letting kids use their own devices, but they don't really have a clear plan of what they want to accomplish by integrating those devices into the classroom."

Second, teachers can't overlay devices on top of existing lesson plans. "You actually need to re-engineer your lesson plans, how you approach instruction, even how you have your class set up to really take advantage of the features and functionality of the devices," she asserted. If "kids were bored before with the way you were teaching, they're still bored," no matter what device they're using. "The difference now is they have a device that could be more compelling and interesting to them."

Evans is convinced that strong pedagogy trumps mobile devices' potential to distract students from the task at hand. "If you change the way you're teaching and incorporate the devices into instruction — the teachers tell me, the kids tell me — they're way too busy learning to do that kind of stuff." the

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5 REASONS TO **LOVE** CELL PHONES IN THE CLASSROOM

- Students can "self-direct" their learning.
- Students can give lessons to other students in how to solve problems with video "selfies."
- Students can view online videos that help them learn differently from the way their teachers teach.
- Students can sign up for notifications to receive alerts during emergencies.
- Cell phones can serve as camera, calculator, recorder, textbook, response device and research tool, all in one.

5 REASONS TO **HATE** CELL PHONES IN THE CLASSROOM*

- Students "surreptitiously thumb them under desks" when they're supposed to be listening.
- Students pull them out in class "to play games" until told explicitly to put them away.
- Cell phones spark a "constant battle" for attention.
- Teachers can't tell when phones are "being used for legitimate learning" and when they're not.
- Teachers are "tired of being the bad guy for hassling kids about them."

* *From Mister McIntosh Says*

NEXT: Designing the classroom of the future

Greg Thompson

4 Keys to Designing the Classroom of the Future

Forget about rows of desks pointed at a whiteboard. Mobile technology is reshaping teaching and learning.

Designing the classroom of the future is no easy task, mostly because it's difficult to know what the future will look like. As little as five years ago, few could have predicted the ubiquity of tablets and their accompanying need for more and more WiFi capabilities. Even the maker movement's reliance on "creative spaces" is a relatively new phenomenon.

As quickly as new technologies arise, other devices previously deemed indispensable fall out of favor. Take the interactive whiteboard, for example. According to J.D. Ferries-Rowe, chief information officer at **Brebeuf Jesuit Preparatory School** in Indianapolis, the school made a sizable investment in IWBs about a decade ago. These days, Ferries-Rowe can't resist criticizing the boards as inherently "teacher-driven."

Ferries-Rowe works closely with Brebeuf assistant principal Jen LaMaster, and both are keenly tuned in to 21st century learning. "With interactive boards, teachers are standing there tapping, essentially using it like a chalkboard," said LaMaster, with a trace of wistfulness. "It pretends to be interactive, but the most interactive you can be is two kids standing at the board and 18 watching. It's the opposite of an experiential activity."

"Interactive boards are on their way out," agreed Sam Farsaii, chief technology officer for the **Coppell Independent School District** in Dallas. "With inexpensive devices such as tablets, and a projector system, you can simulate whiteboard activities in an even more interactive way." Farsaii pointed out that even the physical height of interactive boards can be problematic, particularly for elementary students. In the interest of cost-effectiveness, Farsaii reported that IWBs will stay in the Coppell district "as long as the products function, to maximize their use," but he and Ferries-Rowe agree that interactive whiteboards are a prime example of how tricky it can be to plan a classroom around any one technology. "I refuse to write a technology plan that goes beyond five years," said Ferries-Rowe. "Anything beyond five years is *Star Trek*."

Brebeuf's new standard classroom can be set up as clusters, rows, circles or semicircles based on the main activity of the room.

Create Collaborative Spaces

Erin Klein, a second-grade teacher and technology/design consultant, has a mission to bring flexibility and comfort to learning spaces. Regardless of future technology, she maintains that flexible seating arrangements that allow for easy transitions will serve students today and in the future. “Movement is so important in the classroom, especially at the elementary level,” said Klein, who teaches in the Bloomfield Hills area of Michigan. “I have two elementary-aged children of my own, and I know how often they need to transition. My students were telling me that they weren’t comfortable, and that it was hard to talk to the person across from them without shouting because of the configuration of the desks. They were so far apart, so I got rid of the desks and asked them how they wanted to sit.”

Designing the classroom for students means planning for their future needs, and first and foremost that means open access to the Internet, a feature of the modern classroom that is not likely to go out of style anytime soon. “We need stations to charge multiple devices,” said Klein, the reigning Michigan Association for Computer Users in Learning’s Technology Teacher of the Year. “The room needs to be outfitted with a lot of outlets that aren’t just for regular plugs, but also for USBs.” And planning for a 1-to-1 environment is not enough, she said. “Eventually, it’s going to be a 1-to-3 or 1-to-4.”

Brebeuf now has more than a mile of cable running through walls, ceilings and the tech cabinet.

(To read about how one school has designed outlets for the future, see the sidebar at right.)

With so many students coming to school with smartphones, laptops, tablets and iPods, having a place to display information for small groups will continue to be crucial, whether it's done with an interactive whiteboard, a projector or something yet to be invented. Ferries-Rowe said, "They may come up with something else, but right now I'm intrigued by the projector tables, especially as Windows 8 becomes more mature. I have seen some of the table projectors where a group of kids can be clustered around, moving things around and rearranging things. That is intriguing technology."

LaMaster added, "We are looking at the idea of collaborative spaces — a mediascape system where students are quickly able to share with students what they are doing." She added, "The combination of the classroom and the cloud becomes more and more important, because it's no longer all of us taking notes. We are using cloud-based documents to take collaborative notes. Final notes are posted. Any technologies that begin to merge cloud and classroom are going to be big in the future — that is why going 'multiscreen' seems to be more important when thinking about future design."

BUILT IN THE PRESENT, DESIGNED FOR THE FUTURE

In August, a brand-new school opened in the Dallas-based **Coppell Independent School District**, and 30-year veteran Sam Farsaii, chief technology officer at Coppell, had the rare chance to contribute ideas to the school's design. The new school, called **Lee Elementary**, is a state-of-the-art educational institution designed with the future in mind.

***THE Journal*: What does your new school look like?**

Farsaii: There are lots of windows, open spaces and flexible spaces that can be rearranged for multiple uses. There are "wet" areas, as well as dry lab areas even at the elementary level, so students can pursue what they are interested in, simulate or be creative, rather than just be confined to the classroom.

***THE Journal*: What advancements are particularly focused on the future?**

Farsaii: Lee Elementary is the first elementary green school in Texas, designed with sensitivity to our environment. Solar panels are on top of the school, geothermal wells are underground, as well as systems to collect rainwater. These resources will be used to gather data and information so students are basically in a living laboratory. Every day they are tracking the usage of electricity, water consumption, temperature and quality of the air.

***THE Journal*: From a technological standpoint, what are the design elements?**

Farsaii: It's important to have as many electrical outlets as possible so students can charge their devices. Some outlets actually have integrated USB ports within them. There are portable towers that can recharge multiple USB devices, similar to what you see in the airports. These are flexible in nature and can be retrofitted as technology changes. So today it's USB, tomorrow it might be another port standard. Flexibility is most important, and that is a challenge.

There is tremendous wireless capacity. There are a lot of schools that claim they have wireless technology, but it's another thing to have enough wireless capacity — almost one access point in every classroom — to accommodate current needs and needs of the future. While a lot of districts are focusing on 1-to-1 devices, we are seeing students with many devices in their possession, including smartphones, tablets and laptops.

Brebeuf is renovating the school with an eye on 3D modeling presentations. LaMaster and Ferries-Rowe are reviewing everything. “Lighting has come so far,” said Ferries-Rowe. “We get these Philips Hue lights where you can control five different lightbulbs with intensity, color and very dim to very bright. What does lighting mean when displaying art? It’s something for students to consider as presentations change in the future.”

Connectivity Is Key

The old classroom filled with rows of desks designed to support teacher-centered curriculums may no longer be in vogue, but the old construction remains. With bandwidth requirements escalating, these older buildings can provide a huge obstacle. As Farsaii put it, “These days, wireless is the lifeblood of schools. Sheetrock and glass can be penetrated, but older buildings have brick and mortar, and getting signal penetration is a big challenge.”

Klein explained that the historic schoolhouse where she teaches is aesthetically pleasing, but that the cement walls stifle connectivity. “When we have parents come in for open house, oftentimes it’s hard for them to get a signal out of the building,” she said. To address the issue, she said, “We are currently renovating our entire multimedia lab. Everything that is not a load-bearing wall has been flattened and removed.”

“Wheelbarrow” desks (which have two legs with locking wheels and two legs with posts), allow students to reset a class from clusters to rows in less than 30 seconds.

When construction is complete, she said, “It’s going to

be a mobile cafe. Children will be able to have laptops, iPads, and interactive projectors on the walls. There is going to be a bank of computers on a wall. Most of the children will be able to get their word-processing or Internet on the mobile devices. There is room for a lot of work if districts are willing to be creative."

Teachers Need Coaching

Klein believes that creative people are just as important as equipment in designing the classroom of the future, and to her that means full-time employees to coach teachers. Klein reasons that successfully integrating technology and education requires at least one "coach" per school.

Brebeuf's new classrooms expedite sharing content from student devices.

"I know a lot of districts are struggling to even create that position, but it's important," she said. "People who are in these coaching-type positions for technology integration are often overwhelmed. There must be opportunities to work with teachers, grade levels or departments in a more meaningful way if you want to shape a state-of-the-art classroom. You can't just say, 'Here's an app or website.' Coaches need to collaborate by redesigning the curriculum to support blended learning. And ultimately, I would hope that the term 'blended learning' would disappear, and that it would just be assumed that technology would be integrated."

When it comes to PD, LaMaster cautioned administrators against the assumption that younger teachers will pick up all the tech tools they need on their own. "Some people think that anyone under the age of 26 magically knows how to use all this stuff, and use it in an interesting manner, but that has not been my experience," she said. "Give teachers a place to try new things out and ask questions, because these are all new environments…. You can buy all the futuristic equipment you want, but you must provide that help."

Curriculum Comes First

For Klein, the classroom of the future is only worth creating if it supports the fundamental mission of teaching students. Special needs kids with dyslexia, for example, have already benefited from technology. "I had a little girl with dyslexia, and it was a challenge for her whenever we were in writing workshop and drafting stories," explained Klein. "She was one of the best oral storytellers, and we often do oral storytelling as a rehearsal method before we put pencil to paper. However, whenever she went to draft her story and actually put that pencil to paper, she would write about two sentences and then get frustrated.

But the story has a happy ending. Klein had a Live Scribe Smartpen, so that as the student wrote and talked out loud, the pen recorded every stroke she made and the audio that corresponded with that stroke. "At 7 years old, she was sketching her ideas out across her five-page story, and she could talk out loud as she was sketching. So it's really encouraging that metacognitive processing. She could go back anywhere in her sketch or illustration and touch the given keystrokes at the part she was thinking about and hear her audio playback. That allowed her to finish writing her thoughts before they would get lost again."

Klein concluded, "Ultimately, you really need to think about the design and layout of your space and how that can support your curriculum. Then you can start thinking about how to outfit your infrastructure and what devices you might need to enhance the curriculum." the

Greg Thompson is a writer based in Fort Collins, CO.

NEXT:
Learning from ed tech in other countries

Bridget McCrea

3 Lessons American Districts Can Learn From Foreign Schools

As countries around the world take innovative approaches to technology, U.S. educators can adopt these best practices from their colleagues in Singapore, Mexico and Japan.

With thousands of domestic K-12 institutions to cull information and advice from, schools in the United States have seldom looked overseas for help selecting and integrating educational technology. However, as the Internet continues to erode traditional geographic barriers — and as international schools post impressive results from their tech initiatives — reaching out to colleagues in other countries for advice and support is becoming more commonplace.

Consider **Plymouth-Canton Community Schools** in Ann Arbor, MI, for example. There, Elliot Soloway, an Arthur F. Thurnau professor at the University of Michigan's College of Engineering, works with Superintendent Michael Meissen to create connections between his institutions and schools in Singapore. According to Soloway, "Singapore schools have traditionally improved test scores through the 'drill, drill, drill' approach, but now they're realizing that this is no longer the right model for education."

Empowering Entrepreneurial Learners

Instead, Soloway explained, schools in Singapore are using a five-year master plan centered on moving institutions away from direct instruction and toward an inquiry-oriented approach that's focused on two key 21st century skills: self-directed learning and collaborative learning. As part of this initiative, Soloway said that students use school-owned smartphones (partially funded through a Qualcomm grant) as search tools as well as communication devices.

High school students from the U.S. and Japan collaborate at the annual Tomodachi STEM Leadership Academy.

"Smartphones fit in the palm of your hand," Soloway said, "which means the third-grader who is walking home, thinking about her recent classroom lesson on roots and plants, can use her phone to become a 'root detective' on the spot — rather than waiting until she gets to a computer."

The schools also provide students with University of Michigan's MyDesk, an application suite designed for self-directed, creative and effective learning. The app grew out of the "Learning Apps for Primary Education" course at the university and includes productivity,

concept-mapping, charting, writing and animation apps that students can use across different subject areas.

Soloway pointed out that Singapore's new approach to education and educational technology has been particularly effective when working with low achievers. "These students need an edge and some leverage, and the mobile devices are the key," said Soloway, who sees country-wide positive results in store for Singapore as its schools continue to deploy technology and lean toward more self-directed learning. "It's such a small country and its economics (namely, the fact that Singapore lacks any significant natural resources) dictate that all citizens must be leaders," said Soloway. "This is a great way for it to develop more entrepreneurial-minded learners."

Using High Tech to Prepare for High Turnover

When the **Atid School** in Mexico City rolled out its 1-to-1 program four years ago, it steered clear of iPads. The school also chose the BYOD route over school-owned laptops, insisted on using a robust mobile device management (MDM) platform, and placed a priority on both introductory and ongoing professional development for its 200 instructors. The school, which has 1,200 students in pre-K through 12th grade, worked closely with Apple to establish student pricing on MacBooks, which would become the devices of choice for the program.

Christian Hernández, the school's IT and ed tech director, said that the school opted out of the tablet craze because the mobile devices didn't have the capability to handle CAD design or 3D printing. "The iPad isn't powerful enough yet for the applications we're using in middle and high school," said Hernández. He added that today, some elementary classrooms use iPads and other students

can bring their tablets to school if they want, "but only if they are running the Apple operating system."

Because it went the BYOD route, the Atid School also had to come up with a plan for accommodating those students whose families couldn't afford to purchase devices, even at Apple's discounted student rate. For those pupils, the institution offers a monthly rental plan and also provides roughly 300 school-owned laptops across various labs and classrooms.

WORLD CLASS

VIDEO: An international team of students presents its final project on the last day of the Tomodachi STEM Leadership Academy.

The school also implemented Apple's Mavericks Server Profile Manager MDM platform to track the 1,500 or so total devices that can be connected to its network. "Using the MDM and our own servers," said Hernández, "we can deploy school policies and monitor the software and content for all devices that are on our network."

Before rolling out its 1-to-1 program in 2010, the Atid School set up a comprehensive professional development program that would not only be used by the current teaching staff, but also by the following school year's crop of new instructors. "Here in Mexico, the teacher rotation through the schools is very high, so every year we work to get new teachers to the same level of their predecessors," Hernández said. "The high turnover can be difficult on the tech department."

To combat this ongoing issue, the school evaluates all new teachers on their technology use as it applies to teaching strategies. After being placed into one of six different levels, teachers enroll in training courses and one-on-one coaching sessions. "In the sessions, we help them implement technology according to their respective subject areas," said Hernández. "Thanks to the coaching, our teachers are on track when it comes to using technology in the classroom." As an added layer of PD, teachers are also encouraged to participate in and earn their certifications from the Apple Distinguished Educators Program.

With about four years of successful 1-to-1 program administration under its belt, the Atid School has not only managed to cultivate a group of tech-savvy teachers, but it has also improved teaching and learning. "We've been measuring standardized test results and seeing good results so far," said Hernández, "particularly in the area of language acquisition."

Leadership That Promotes STEM

Patrick Adams' international ambitions began two years ago when the science teacher from **Bellarmine College Preparatory** in San Jose, CA, flew to Japan to participate in Toshiba's **Tomodachi STEM Leadership Academy**, an annual one-week, cross-cultural STEM exchange and leadership program for 16 high school students and eight teachers from Japan and the U.S.

During Adams' overseas trip, he observed at the academy and gave input on how more science, technology and cultural activities could be integrated into a shared scientific approach. For example, he began looking at the similarities between Japan's Super Science Academies (upper secondary schools that prioritize science, technology and mathematics) and America's science-focused charter schools. He toured

Adams' trip to Japan showed him how science, tech and cultural activities could be integrated into a shared scientific approach.

some of those focused high schools in Japan, looked at their current projects and got to meet several teachers while there.

"It was interesting for me to see how these highly specialized schools can really focus in on being cutting-edge with science and technology," said Adams. "It's an approach that's been very successful in Japan, and it creates an emphasis that permeates everything they do at the schools."

At one school, for example, students were working in rice paddies, studying plant genetics and mixing traditional Japanese culture with modern science. When Adams returned to the U.S., he started talking to other teachers about how to transform a half-acre garden on Bellarmine College Preparatory's grounds into a useful component of the institution's science curriculum. "The idea of giving students that type of interface is pretty exciting," said Adams.

In return, Adams said he was able to share information about his school's learning management system (LMS) with his Japanese counterparts, many of whom lacked knowledge of and hands-on experience with such systems. "LMS is fairly new in the U.S. and really hasn't taken off in Japan yet," said Adams, who uses the Canvas by Instructure platform. "It was nice to be able to share that piece of technology with them and show them how our students and teachers use the LMS to keep track of activities, calendars, assignments and discussion groups." the

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NEXT:
Making the most of the new E-rate

Geoffrey H. Fletcher

5 Ways to Make the Most of the New E-Rate

As funding is phased out for some technologies and increased for others, here's how you can get more of what you need.

Now that the FCC has adopted the *E-rate Modernization Order*, you may be wondering what it means for your district and what you should do to prepare. While there is no substitute for reading the 176-page order, you can read the FCC's official summary of the order, which comes in at a much more manageable 10 pages, here. No matter which reading assignment you choose, there are a few high-level things you can expect as you plan for upgrading broadband and WiFi connections over the next five years.

More internal connections: The order sets a target of providing $1 billion annually for internal connections. This category includes basic maintenance, managed WiFi, caching and other similar services. As has been the case since the beginning of the E-rate, applicants will continue to pay a percentage of the costs of the E-rate service (called the contribution rate), and the size of that percentage will be based on the poverty level of the population your school serves and whether it is located in a rural or urban area. For broadband connectivity to schools, now termed category one, the minimum contribution rate remains at 10 percent. For internal connections (category two) the minimum contribution rate for schools is 15 percent. The hope is that increasing schools' minimum contribution will spread available funds more widely and encourage applicants to find the most cost-effective solutions to because they are paying a little more.

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A second intent for the way internal connections are handled is to make budgeting for these service more predictable by establishing a specific, per-student amount — $150 pre-discount — over a five-year period. Applications for internal connection funding must be made on a school-by-school basis, which allows districts the flexibility to apply for part of the funds one year and part the next.

Phasing out of support for some services, elimination of support for others: The discount rate for voice services will be reduced by 20 percentage points every funding year beginning in funding year 2015, which starts July 1, 2015. Paging, e-mail and other similar services will not be eligible for any support at all beginning in the 2015 funding year.

Increased pricing transparency: USAC will be required to make information regarding services and equipment purchased by schools and libraries public. The hope is that this information will help schools and libraries negotiate lower prices when they see the pricing others are getting.

More consortia and bulk purchasing: The order encourages bulk purchasing and purchases made through consortia by prioritizing review of consortia applications and possibly exempting preferred master contracts from filing an FCC Form 470.

A simplified application process: The complete details of the new E-rate applications won't be made public until USAC figures out all the procedures, but school leaders can count on at least three improvements: 1) a streamlined application for multiyear contracts; 2) electronic filing of documents over the next three years; and 3) simplified discount rate calculations.

What Can You Do About It?

Exactly how all this will be handled administratively is yet to be seen. The state E-rate coordinators are scheduled to have a training session with USAC and the FCC late in September, and they will begin to disseminate what they learned in that session some time later in the fall. In the meantime, there is much you can do, some of which is time-sensitive. Here are the top five actions you can take to prepare for implementation of the modernized E-rate.

1) Check out your network. If you haven't already, you need to look closely at all aspects of your connection to the Internet, and you should do so at different times of the day. Peak times such as the start of classes are especially crucial. It also is important to check the network throughput at different points as data passes into the district, among buildings and within buildings. Each of these connections can be a choke point. In the context of the modernized E-rate, with its additional money for WiFi, having this data will help you in planning for what you need, applying for E-rate funds, and monitoring when you will need more bandwidth as use increases over the years.

2) Check with your curriculum and assessment people. Are there new textbook adoptions on the horizon? If so, do any of those materials include Internet-based resources? Are there new initiatives that could impact the network, such as coding classes or an increase in online gaming or simulations? Try to get a complete picture of instructional activities that teachers in the district are using or thinking about using.

Will your schools be participating in online assessments? If so, will the assessments take place only at the end of the year, or do your schools have interim formative or benchmark assessments planned at regular intervals?

Will you be able to conduct online assessments for certain groups of students and still ensure that teachers and other students have the necessary access for normal classroom activities?

The new E-rate will encourage pricing transparency and bulk purchasing — and a simplified application process just might make your life easier.

3) Create a plan with a clear budget. If you have a good idea of your network's current capacity and usage on a school-by-school basis, you are in a good position to plan for what you might need and understand how those needs can be addressed by the new E-rate. Understanding how teachers and students might be using the network over the next few years is key in creating a plan and applying for E-rate funds.

Here is an example of how the internal connectivity could work, according to the FCC summary of the order: If a school district of 1,000 students is at the 80 percent discount level, it can count on $120 per student (80 percent of the allotted $150) or $120,000 in E-rate funding for internal connections over a five-year period. If the district only wants to receive $20,000 in support one year, it has four more years to request the additional $100,000. If you used to receive E-rate support for voice, paging, e-mail or other services that the FCC is phasing out support for, be sure to figure that into your plan and budget.

4) Don't forget Internet access. With all the focus on increasing internal connections, districts still need basic Internet access, and Internet access remains the highest priority for E-rate.

5) Make your voice heard. The FCC included a Further Notice of Proposed Rule-Making as a part of the order. The FNPRM is only 12 pages, based on which the FCC is asking for input on a variety of topics, including meeting future funding needs, ensuring that multiyear contracts are efficient, standardizing the collection of National School Lunch Program data, encouraging consortium participation and ensuring support for libraries is sufficient.

Districts especially need to speak up about their future funding needs. The FCC is looking for data on the gap between schools' current connectivity and the specific connectivity targets that the FCC adopted in the order. Those targets coincide with the State Education Technology Directors Association's recommendation for Internet access for schools: at least 100 Mbps per 1,000 students and staff in the short term and 1 Gbps Internet access per 1,000 users in the longer term. The FCC wants to know how much funding districts need to bridge the gaps between current levels and the targets. They acknowledge that inflation has eaten into the real purchasing power of E-rate funds by $800 million to $900 million since the program began in 1996. Now is the time to let the FCC know how that reduced purchasing power has affected your district.

Schools need to speak up about their future funding needs, especially when it comes to bridging the gap between their current connectivity and the connectivity targets that the FCC adopted in the new order.

While the E-rate may not be the sexiest topic, it is by far the greatest governmental support for technology in education. It has saved school districts billions of dollars and, with its recent modernization, will bring the power of the Internet closer still to students. Look for further information from your state E-rate coordinator in September or October, and take the time to respond to the FNPRM. The FCC is listening. the

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THE JOURNAL

thejournal.com September 2014 : vol. 41 : no.9

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THE Journal (ISSN 1553-7544) is published monthly by 1105 Media, Inc., 9201 Oakdale Avenue, Ste. 101, Chatsworth, CA 91311. Complimentary subscriptions are sent to qualifying subscribers. Subscription inquiries, print back issue requests, and address changes: Mail to: *THE Journal*, P.O. Box 2166, Skokie, IL 60076-7866; e-mail T.H.E.Journal@1105service.com or call 866-293-3194 for US & Canada, (847) 763-9560 for International; fax (847) 763-9564.

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