

20 IT Challenges for These Times—with Advice for Facing Them Head On

Guidance from two education technology experts on surviving and thriving this year while improving your IT operations and effectiveness and promoting better outcomes for your students, no matter where they're doing their learning.



CYBERSECURITY

Trend: The number of cyberattacks on schools continues to rise, even as K-12 remains ill-equipped to address cybersecurity threats.

Challenge: Embedding a culture of security into schools.

In its [latest annual study](#), the K-12 Cybersecurity Resource Center reported that public K-12 education entities “had experienced a total of 348 cybersecurity incidents during calendar year 2019.” According to author Doug Levin, that’s almost triple what schools disclosed publicly in the prior year. Those break-ins were dominated by data breaches (more than half of which were “due to the actions of insiders in the school community”), followed by ransomware. Levin noted in a [May update](#) that he feels “safe in predicting that there will be more publicly-disclosed incidents in 2020 than there were in 2018.” No wonder IT leaders just named cybersecurity the number one priority in CoSN’s “[K-12 IT Leadership Survey Report](#)” for the third year in a row.

“I don’t think cybersecurity has become part of the cultural awareness within a school system,” said Matthew Dascoli, an education strategist at Dell Technologies who previously served as manager of instructional technology for a large school system in Virginia. “It’s not part of the everyday language for faculty, students,



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Adam Robyak serves as a field chief technology officer and principal engineer for Dell Technologies.

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administration or central office personnel. Cybersecurity needs to be part of first-action thinking, like we talk about student safety, especially in the rapidly changing environment introduced by remote learning.”

“Oftentimes, when we talk about security, people think if they put a firewall on the internet connection, life is good,” added Adam Robyak, who serves as a field chief technology officer and principal engineer for Dell Technologies. “But if a member of the school community uses a device from home that’s already infected and plugs it into the network, “they’ve essentially bypassed any perimeter security.” Even allowing people to remotely access systems from home can introduce threats, he said.

Advice: *Developing a culture calls for you to help people gain an appreciation for the dangers of cyber threats (without a lot of tech minutia) through professional development, regular conversations and phishing tests. At the same time, make sure your cybersecurity profile protects all the way out to the extended edge as opposed to focusing on the traditional perimeter. As Dascoli pointed out, you should already have an antivirus solution in place. That’s practically a no-brainer. “But when you start looking at identity management and having your credentials stolen—the types of things that happen on the web today—those are different types of risks that require different types of solutions.” Test your organization’s security strength with this Dell quiz.*

Challenge: Keeping up with student data privacy rules that are complex and reach beyond school walls.

While you’re at it, make sure you’re staying current with student data privacy, which is what’s often lost when a data breach occurs (alongside payroll details, health data and other personally identifiable information). Part of the problem, suggested Dascoli, is that too many schools trust their third-party companies to keep school data safe. That’s not always the case. One school system, [Kennewick School](#)

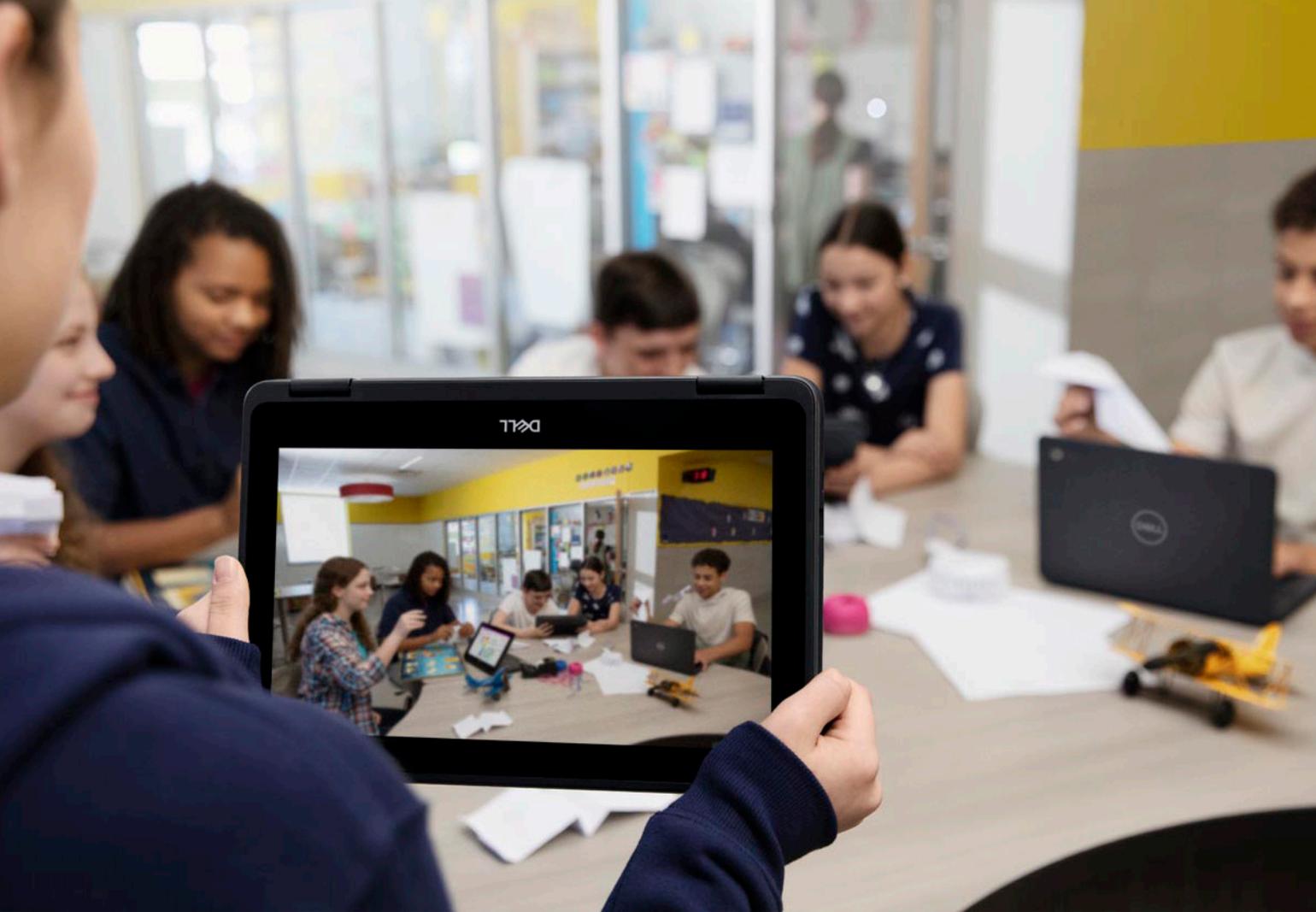
[District](#) in Washington state, turned to its primary security vendor to perform a test of all the provider systems used in the district and found a patchable security flaw in one provider’s networks.

Laws and rules regulating student data privacy “haven’t been helpful to schools, because they’ve lagged behind the movement of technology,” he said. “I don’t think a lot of cloud-borne companies necessarily take a security-first approach to how they develop their services. That will certainly become a major issue as more school systems become targets for nefarious cyber activity.”

Advice: *Adopt the use of a standardized student data privacy agreements for third-party companies that spells out what data is collected, how it can be used and who can access it. Two resources that can help you on this are the [CoSN Leadership Initiative on Protecting Privacy in Connecting Learning Toolkit](#) and the [Access 4 Learning Community’s Privacy Contract Framework](#) project, which is developing ways for schools to streamline data privacy compliance in the tools that they adopt.*

Challenge: Giving device management the attention it deserves.

Don’t forget the security profiles of the devices being used in your “education anywhere/anytime” environment. While certain solutions have made mobile device management simple for particular platforms, those solutions may not be widespread in every district, noted Dascoli. It may simply mean that by adopting 1-to-1 programs and mobile carts, school IT leaders assumed they had device management under control. It’s still important to provision devices and authenticate them before they get on the network and set guardrails for app deployment. Besides, he said, “You very rarely have 100 percent of anything in the school system. So, you are going to have to have some sort of mobile device management system for all of the other stuff that’s out there.”



Advice: *Maybe it's time to re-examine how you manage devices in your district for the sake of security and compliance and implement a sound lifecycle management plan for those devices. Today's mobile device management solutions also provide functionality for tracking devices, monitoring application usage (which can come in handy for figuring out what software people are really using), application whitelisting and blacklisting and password and data encryption enforcement. And make sure the program you choose can cover any kind of device, no matter what the operating system.*

Challenge: Addressing Chromebook security risks.

Chromebooks, in particular, have garnered a reputation for having an operating system that's always current and patched. "When you look at how Chromebooks are deployed and managed, the mobile device management system

that comes with the G Suite for Education license is pretty effective," noted Robyak. "It does a very good job at managing those Chromebooks."

However, third-party marketplaces do introduce risk. As he explained, users can plug in browser extensions and add-ons to a Chrome browser within a Chromebook and thereby introduce vulnerabilities. Likewise, he added, "Even with the lockdown capabilities that Chromebooks offer, nothing stops students and/or faculty from going to nefarious sites and clicking on links that can introduce an element of risk."

Advice: *Don't be overly confident regarding the use of Chromebooks, which can still pose a security risk. Take a holistic approach to your device security. Make sure you train users and isolate access to prevent rogue devices from infecting the entire network. And, advised Robyak, develop "a good plan for mitigating threats and doing that isolation to circumvent holes or gaps that may be exploited through Chromebooks or any other devices in use."*

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IT INFRASTRUCTURE

Trend: Districts will continue to ignore upgrades of their servers and other technology infrastructure at their own peril.

Challenge: Too little investment in infrastructure, slowing IT down in other areas.

According to research from [Futuresource](#), more than two-thirds of school systems (68 percent) refresh their servers only every five to eight years. Some don't even set a timeframe; they prefer to wait until their servers have reached end-of-life. While some of this delay may be due to an increased reliance on off-premise, cloud-based applications for business-critical work, it also introduces an element of risk in operations, suggested Robyak. Also, he noted, with the massive move to remote teaching and learning, schools need to be even more cautious because those data-centers they're counting on are more likely to be exposed to outside entities.

"Newer types of applications require better performance and higher compute," Robyak said. "In addition, by leaving aging or legacy servers in place, there's a need for longer-term lifecycle maintenance and patching—work that can sometimes be circumvented with newer hardware," especially in the areas of automatic notification and proactive support functionality. By keeping servers around beyond three or four years, the people supporting that equipment must work harder.

Modern server technologies don't simply run the same old processes faster; they add elements that simplify IT support, administration and security. Analyst firm [IDC](#) has calculated that server performance erodes by 14 percent annually. By the fifth year of usage, a server will have just 40 percent of the performance it had when it was new. Also,

the failure rate rises—by 20 percent each year. The use of fewer, more powerful servers increases the capacity for virtual machine density while also reducing expenses for heating and cooling and shrinking space requirements and maintenance work. Plus, these newer servers embed security into the hardware and firmware.

Advice: Put your data center infrastructure on an upgrade cycle that will ensure optimal performance, consolidation, management efficiency and reliability. Consider newer technologies, such as hyperconverged infrastructure to simplify operations, like [Rialto Unified School District](#) did. Your K-12 organization will save in capital and operating costs over the lifetime of that equipment.

Challenge: Taking backups seriously without first experiencing a break-in.

Futuresource found that four in 10 districts back up their data only monthly or even less frequently. And just a third of their data (35 percent) is encrypted before transmission. Bigger districts have an advantage here; they're more likely to use frequently and regularly scheduled backups and encryption.

Infrequent backups are a menace, said Dascoli. "You're not creating a backup for the sake of creating a backup. You're doing it in case of a ransomware attack. You're doing it in case of a catastrophic event at your data center."

"It seems to be a trend," added Robyak, that organizations approach the topic of backups and archives, spot checks and monthly reviews as a half-hearted effort—"until something bad happens. And then panic sets in." After all, he noted, if a district isn't taking the appropriate steps ahead of time, attacks are "so immediate and so sudden, there really is no response at that point."

Advice: Consider the scenarios where you'd lose access to your data and anything else that should be maintained in regular, frequent backups. How would that look to your superintendent,

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members of the education board or, for that matter, local reporters? Do you want to risk school closures as you attempt to rebuild what was lost? Use stories of catastrophe to inspire your planning and development of a persuasive business case for investing in modern storage infrastructure and updated backup practices, including periodic data recovery checks. Learn more in this *THE Journal* and Dell report: "The 5 Essential Do's & Don'ts of Data Protection."

Challenge: Grappling with SaaS security concerns.

While you're at it, don't forget about the use of software-as-a-service and your access to the data those SaaS providers generally control. You're at their mercy to "ensure that they are taking the necessary steps to back up and archive and store data appropriately," Robyak asserted.

For example, somebody could inadvertently post a document in a Google Drive that includes personally identifiable information about students or staff without realizing that the drive is shared to the public. In an instant, the district could have a data breach on its hands.

Advice: Make sure your strategy for backup and archive considers an environment where applications and the data they produce "are constantly moving in and out of the on-premise infrastructure." While you may want to use a 3-2-1 backup approach (three copies of each file, two on separate physical devices and one offsite) for the data under your control, make sure you understand what steps SaaS companies take to protect

the data that's yours but kept in their systems.

And take what steps you can on your end as well. In that data leak example, the use of a cloud access security broker (CASB) such as [Netskope](#) would serve as a circuit breaker between the school system and the cloud service provider to prevent the casual and accidental leak of PII by alerting IT to the specific risk.

Challenge: Maintaining reliable IT services from afar.

The members of your school staff are no longer in a single location anymore. How do you ensure the district can continue normal operations? By enabling everybody to work remotely, including your IT organization. Yet nobody in IT has time to really sort through the complicated combinations of client devices, connectivity speeds, compliance issues, application needs or authentications.

Advice: What's needed is a platform that combines access control, application management and multiplatform endpoint management, such as [VMware's Workspace ONE](#). The purpose of this solution is to give everybody access to their own set of applications with a single sign-on. IT can register any device and manage and monitor it from the cloud any time that device goes online. For people using their personal machines, IT can segment district information from personal applications with minimal access rules to keep education resources protected, while still applying the necessary policies, patches, updates and configurations and deploying applications.

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IT BUDGETING

Trend: District IT budgets are going to shrink in the current environment.

Challenge: Keeping up with growing demand for IT and doing so with fewer funds.

CoSN's latest survey of IT leaders found that respondents considered the top challenge to planning and implementing technology-enabled learning to be "budget constraints and lack of resources." That has held true among school IT leaders for the last four years. And the demand for tech usage is only growing now alongside massive state and local tax losses due to the economic situation. It's inevitable that districts will face budget cuts this year and ongoing.

What are IT organizations supposed to do as expectations rise? Currently, the largest portion of IT budgets is being spent on sustaining back-end infrastructure, including servers, storage and networks. Therein lies the opportunity for change.

Advice: *It's time to set your IT budget based not on last year's numbers but on this year's district needs and strategies. Think about how you're going to achieve those. Modernizing the data center to be more self-running can go a long way in freeing up IT dollars for use in more vital areas. So can the move to SaaS services that offload management and maintenance of applications to experts outside of district walls. But be careful there. Don't weaken the IT budget by simply pouring it into OpEx instead of CapEx. Pick programs based on "how big of an impact they'll make," advised Dascoli.*

Challenge: Keeping IT focus on what really counts in education.

Recasting IT investments begins with gaining a better understanding of educational outcomes and spending

less time keeping the lights on or choosing technology. "Going 1-to-1 is not about getting laptops into kids' hands," said Dascoli. "If that's your area of focus, you'll never get consistent structure there."

It's time for IT "to take a more active role in collaborating with faculty and administration to better understand what those educational outcomes are," added Robyak. "And then they need to turn the focus inward and ask, how can we make a positive improvement and provide more value back to the students and the faculty?"

Advice: *While you're prioritizing IT plans, make sure they focus on the people and not the technology. Develop metrics that make sense for your schools—not necessarily around test scores but around other areas that have impact on learning outcomes, such as student engagement and participation as measured by technology usage or parent participation in the learning process.*

Challenge: Pouring too much IT budget into products that aren't being used effectively – or at all.

A study last year by *Glimpse K12*, found that an average of 67 percent of software licenses were going unused in the 275 schools being analyzed; in some places lack of usage was as high as 90 percent. That translated to about \$2 million "in wasted spending across all 275 schools," or nearly \$7,300 per school. The company suggested that much of the waste was a result of schools not setting "clear expectations for usage and implementation fidelity." Glimpse Co-founder Robyak Pearson suggested that two questions school leaders need to ask are: "Do our teachers really want these digital tools, and are we ready to implement the technology?"

The issue will only get more intense, noted Dascoli. "As we shift to more digital learning environments, the number of platforms increase, and some are not as effective as others."

Schools must "find a good balance of simplicity and efficacy in their choices of applications and digital learning



systems,” Robyak asserted, “while reducing sprawl and cost.”

Advice: *The move to SaaS provides the means for understanding usage patterns for the software and services your schools have adopted. Analysis of the data can help the IT organization identify where the holes in usage are and sort out whether it's a problem of professional development, a problem of waste or something else altogether.*

EDUCATION DATA

Trend: Schools are going to continue struggling with data—especially how to use it most effectively.

Challenge: Gaining a unified view of an individual student without the complications.

“School systems have yet to appreciate the volume of data they have access to and can leverage that can be aligned to student outcomes,” said Dascoli. “And because they’ve adopted SaaS in such a large fashion, their data is all over the place.” That leaves school leaders struggling to come up with a “unified view of a particular young person in their

school system,” he noted. And without a unified view, there’s no personalizing content or meeting the specific needs of a young person.

Advice: *To gain a holistic understanding of individual students and the data that represents them, strategize about how to bring some of the SaaS data back in-house for the purpose of analysis and creating workflows through the use of “connector pieces,” software such as [Boomi](#), that can link data from on-premise and cloud systems and present the results in a unified view.*

Challenge: Making data analysis a habit for altering the learning trajectory.

It’s a rare school these days that doesn’t provide students with access to productivity software such as [Google for Education](#) or [Microsoft’s Office 365 Education](#). Yet too few educators take advantage of the data those systems are generating. That could include screen time, log-ins, interactions with other students such as sharing of information. Those kinds of data points could be correlated with target outcomes or other aspects of the educational process to understand which practices lead to greater learning success, said Dascoli.

If that sounds like it might overwhelm your teachers, work with instructional technologists and teacher-leaders

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to figure out what data to start with and how to present it. Make it relevant to today's learning environment: Who's logging in and who's blowing off class? What activities are the learners most drawn to and which ones are being left on the cutting-room floor?

Advice: Consider an investment in software such as [BrightBytes](#), which provides an analytics platform for K-12. In 2019 Microsoft acquired BrightBytes' [DataSense](#) technology and announced plans to integrate the functionality for data transfer and management into its education products.

EDUCATION TECH

Trend: As access to devices in schools becomes less of a concern, the meaningful use of technology is becoming the greater goal.

Challenge: Moving the school's attention away from device inventory and toward device usage.

School reporting has shown ever-increasing numbers of students with access to multiple devices and the high-speed broadband they need to take advantage of them. The latest [CoSN Infrastructure Report](#) found that three-quarters of schools could report a ratio of at least one device per student; and EducationSuperHighway [announced](#) its closure in 2020 because its mission has been fulfilled; 99 percent of schools are now on fiber and delivering at least 100 Kbps of bandwidth per student.

"The next biggest challenge is, are we using this technology in a way that is truly transformative, so that we're actually seeing improved outcomes?" said Dascoli. The

answer in many cases is no. Too often, tech is being used "more as a substitute for paper and pencil, but the practice hasn't changed."

Advice: IT organizations in K-12 need to shift their attention away from the next device refresh and toward addressing the gap between technology and pedagogy. That means finding ways to be more responsive in supporting educators' work in teaching and learning, needs that are intensifying daily with the rapid transition to remote learning.

Challenge: Providing devices to address every type of learning need.

The switch to remote learning has forced immediate growth in 1-to-1 programs. However, that doesn't mean that every student is being served appropriately.

"While districts might be issuing Chromebooks to all students to make sure they have a core level of access, they should also realize that a Chromebook doesn't meet every learning need," said Dascoli. "Schools need to identify how all technologies that are part of a complete learning program that can be delivered at home. For example, ask, can your CTE offering be delivered through a Chromebook?"

Advice: As you set up your device refresh budget, look for those pockets of specific need and make sure students have access to the correct technology for the activities they're doing no matter where the learning occurs. One smart option is to explore the use of virtual desktop infrastructure. The time is right for using VDI to provide secure access to CPU-intensive programs that may not run on the machines your students are using from home. As [Lubbock Independent School District](#) found, the combination of VDI and a hyper-converged infrastructure provided an "Easy Button" for network management and faster performance.



EDUCATION INNOVATION

Trend: IT organizations are realizing that improving IT operations frees up the time and resources for supporting learning innovations.

Challenge: Finding new forms of technology that have true practical use.

No matter what the headlines declare, artificial intelligence in education is a long way off. "We're in an age of what I would call 'intelligent assist,' meaning, 'Hey, Siri, do this' or 'Alexa, do that,'" said Robyak. That's closer to machine learning than AI, he explained. True AI "is when machines make decisions for you as opposed to you feeding information and waiting for an output."

In the near term, where intelligent assist could have the biggest impact currently in the classroom, Robyak predicted,

is in the use of language tools, such as being able to do translations on the fly. "If you have young people from another country in the school system, and English is not their first language, the use of machine learning could help them catch up in class and stay at the same level as other students."

Advice: Evaluate where there are inefficiencies and ask if there are technology solutions that can help. For example, how are you collecting information from students and parents at the beginning of the school year to identify what services they may need that you haven't taken into account?

Challenge: Engaging students through virtual experiences.

Immersive technologies offer great promise for students to have virtual experiences when they can't have the real ones. "When we think about the impact of that for the classroom, what I see is students who are on a field trip and can actually enable the capabilities of their devices to get enhanced feedback and learning when they visit a museum, either in

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person or with a virtual headset,” said Robyak. He suggested that such usage will trickle into field trips to historic places, space travel and the laboratory (for virtual experimentation).

However, he advised, schools should expect “a heavier demand on the back-end infrastructure to not only be able to render those higher-end images and do them very quickly but also have the processing capabilities to run the software that powers it.”

Advice: *This is an area where it's important for students to create rather than just consume. Invest in classroom software that will allow them to take images and videos recorded on their smartphones and convert them into 360-degree experiences or create their own games. Good places to learn the are Digital Promise Global's 360-degree Story Lab and Unity.*

Challenge: Keeping up with student demand for online video gaming with esports.

Nothing has grabbed the attention of students more quickly than the idea that they can play online video games in school. And as the adults have learned, “Esports is not just about gaming; it’s about many other things,” said Robyak. “It teaches teamwork and leadership, good communication skills — there’s even a broadcasting and journalism element to it.” As a result, a lot of school systems are making it a regular part of their classes and club activities.

Paving the way for esports in the district can be as simple as “having an area where students can get together online and making decisions around the type of gaming titles students can play,” Robyak explained.

But “things can get really big, really fast if you want them to,” added Dascoli. What’s tougher to answer are questions around allowing students to broadcast their game-playing on streaming channels such as twitch.tv, drawing a diverse representation of the student body and providing the right kind of coaching to make sure the activity has learning woven into the fun.

Advice: *A lot of different athletic associations, leagues and tech companies have gotten into the game to address the middle and high school esports segment. A few of the major ones are the High School Esports League, (HSEL) and the North America Scholastic Esports Federation (NASEF), each of which have produced esports curriculum, as well as Dell itself, whose K-12 education strategists have advised numerous schools to set up their programs. Also, take lessons from others’ success. Grapevine-Colleyville Independent School District, which runs one of the most successful district esports programs in the country, has grown its program to 155 athletes in three high schools, with 35 student support positions.*

THE EDUCATION TECHNOLOGY GAP

Trend: Schools are recognizing that they have more work to do in helping teachers use technology for “anywhere” teaching and learning.

Challenge: Preparing teachers for effective use of tech when they don’t always know what that looks like.

According to a recent survey by the University of Phoenix College of Education among a thousand teachers, two of the five top concerns respondents had in making the rapid transition to remote instruction involved the use of technology: They were worried that tech support wouldn’t be available when it was needed, and they wanted to be properly trained on the tech for teaching virtually.

These are certainly not new concerns. A survey done in 2018 by the Organization for Economic Co-operation and Development among teachers and school leaders worldwide found that in the United States, just 45 percent



of teachers felt they were “well prepared” or “very well prepared” for the use of information and communications technology (ICT) for teaching.

In response, Richard Culatta, head of the [International Society for Technology in Education \(ISTE\)](#), offered this analogy: “Imagine if more than half of pilots said they felt unprepared to use their navigating equipment. We have more work to do.”

What’s needed, suggested Dascoli, is a greater emphasis on “human capacity.” For example, teacher training programs need to embed best practices for digital learning into the coursework to help educators gain skills in using tech for active and more engaging learning. “Schools are realizing that they can jumpstart their educational efforts involving tech by working with the right partners,” he said.

Advice: Consider those that companies you partner with as resources to help you achieve your goals. Their education consultants can provide the “cross-pollination” perspective that would take you months and years to accumulate on your own and will help you apply the learnings from other districts’ failures

and success. And always keep the well-being of students at the forefront. As you’re adopting technology, if you’re asking, “How does that benefit the kids?” you’re on a good path.

Finding Flexibility and Resilience

The coming year will put every school system to the test. Ultimately, surviving and thriving will require a combination of flexibility and resilience. How do you achieve that? By setting up your infrastructure to stay running even when you can’t physically touch it, finding partners capable of sharing the administrative burden, and staying light on your toes so you can quickly pivot as priorities and demands shift.

Dell Technologies works with school districts to help modernize their IT infrastructure to deliver greater efficiency, predictability and organizational agility and enhance the student experience. Learn more about Dell Technologies K12 solutions by visiting www.DellTechnologies.com/K12