

Innovation in Education

Adapting with Evolving K-12 Challenges

The pandemic and the growing awareness of the need for diversity, equity and inclusion are driving fundamental changes on campuses. To succeed, K-12 districts must find ways to integrate legacy and modern solutions, harness data to improve student experiences, and rethink the way technology is used in the classroom.



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IT Management in an Increasingly Complex K–12 Environment

K–12 technology leaders are applying the lessons they learned during the pandemic to build more innovative, resilient educational systems.

THE LAST FEW YEARS BROUGHT A level of technological complexity to K–12 schools that teachers, students, and administrators are still grappling with. Succeeding in those efforts requires embracing the fluid nature of an increasingly complex world.

“The more complex society gets, the more sophisticated leadership must become. Complexity means change, but specifically it means rapidly occurring, unpredictable,



FutureEd researchers found that the top two categories of spending, at roughly 27% each, were mobile devices for students and infrastructure/hardware. In the third spot was technology that supports learning anywhere at 24%, followed by investments in connectivity at 18%.

nonlinear change,” wrote Michael Fullan in his book *Leading in a Culture of Change*. He went on to say that business and education leaders have more in common than they might realize. Both must find ways to “cultivate and sustain learning under conditions of complex, rapid change.” Furthermore, “schools can learn

from how the best companies innovate and get results.”

Educational leaders learned a number of lessons during the pandemic, and they have already begun to apply them to build a better future for their students and their school districts. These lessons are familiar to IT leaders in government and industry, and they include the need for stronger cybersecurity, robust data analytics for better decision-making, and a more holistic approach to IT management.

Strategic Technology Investments

In a recent “pulse survey” of THE Journal readers, 74% of respondents said the pandemic had prompted their schools to build technology systems that are more student-centric and equity-minded. To achieve that goal, schools must expand their use of HyFlex educational tools and train teachers on how to use them effectively. Many schools also need to invest in connectivity so they can achieve full and equitable access for all students and create a digital presence that is equal to the in-classroom experience.

According to **FutureEd**, an independent think tank at Georgetown University’s McCourt School of Public Policy, “Remote instruction and technology remain key investments despite the widespread return to in-person school.”

FutureEd assessed a Burbio-compiled

database that documents how more than 5,000 local education organizations, most of which are school districts, planned to spend federal Elementary and Secondary School Emergency Relief funds allocated under the American Rescue Plan Act. Those organizations teach 74% of the country's public school students and account for \$83 billion of the \$122 billion in federal funds. FutureEd researchers found that the top two categories of spending, at roughly 27% each, were mobile devices for students and infrastructure/hardware. In the third spot was technology that supports learning anywhere at 24%, followed by investments in connectivity at 18%.

According to THE Journal's survey, schools are also paying closer attention to security, administrative functions, and general IT operations. When asked where their schools

TOP FOUR AREAS WHERE SCHOOLS ARE INVESTING IN TECHNOLOGY

- Networking improvements
- Learning management systems
- Cybersecurity
- Administrative functions



management involves aligning technology with schools' and districts' overall strategic goals. In THE Journal's survey, 90% of respondents said they are either starting out or are well on their way to taking a comprehensive approach to IT management. Only 10% said it is not a priority.

Technology has a role to play in virtually every aspect of school operations, which underscores the need for robust security. Given the amount of sensitive data that schools manage, K-12 systems are attractive targets for cybercriminals.

"Malicious cyber actors are targeting [K-12] educational institutions, leading to ransomware attacks, the theft of data, and the disruption of distance learning services," states a **Joint Cybersecurity Advisory** developed by the Cybersecurity and Infrastructure Security Agency, the FBI, and the Multi-State Information Sharing and Analysis Center.

"These issues will be particularly challenging for K-12 schools that face resource limitations; therefore, educational leadership, information technology personnel, and security personnel will need to balance this risk when determining

74%

Of respondents said the pandemic has prompted their schools to build technology systems that are more student-centric and equity-minded



are investing in technology, respondents cited networking improvements (58%), learning management systems (53%), cybersecurity (44%), and administrative functions (34%).

A Comprehensive Approach to IT Management

Once schools have deployed new technology, they need to be able to manage it effectively. IT

their cybersecurity investments.”

The three agencies have received reports from K-12 institutions about ransomware, malware, distributed denial-of-service attacks, and videoconference disruptions. The advisory also highlights vulnerabilities in terms of social engineering, student data protection, open/exposed ports, and end-of-life software, and it offers comprehensive mitigation measures for all those risks.

A Deeper Understanding of Performance

A key to improving security is understanding what is on a school’s network, how systems are operating, and whether there are any vulnerabilities. Proven solutions include tools for detecting and monitoring endpoint devices and a zero trust approach to security.

Visibility is another important component, and it involves being able to gather data on network operations. Visibility goes hand-in-hand with observability, which refers to gaining insight into what that data means so IT administrators can take appropriate action. Observability is often described as discovering what you don’t know. It is essential for enhancing the security, performance, and effectiveness of technology for teaching and for back-office activities.

When schools apply observability to their budgets, they can better track and understand the impact of their investments in technology and other areas. That approach is also crucial for providing state-wide data on performance, as required under the Every Student Succeeds Act (ESSA).

In **“Going Beyond ESSA Compliance: A 50-State Scan of School Spending Reports,”** Reetchel Presume and Ivy Smith Morgan of



SCHOOLS INCREASINGLY PRIORITIZE TAKING A COMPREHENSIVE APPROACH TO IT MANAGEMENT

- 10% said it’s not a priority
- 20% said they’re starting to think about it
- 31% said they’re becoming more strategic about it
- 13% said they’re implementing a plan
- 26% said it’s one of their top priorities

the nonprofit Education Trust wrote: “It is increasingly clear to the public that how much money is spent in schools, as well as how and where money is invested, significantly influences the educational experiences, outcomes, and futures of students served by our public school system.”

The researchers note that relevant data, however, has historically been difficult to access. They laud ESSA for requiring states to provide per-student spending. However, they wrote, “states should approach ESSA reporting requirements as a baseline to build upon, not the end goal. Equity-oriented school spending data reporting is key to advancing resource equity in local schools.”

As K-12 leaders absorb the lessons of the past few years, they are transforming their approach to technology and building educational systems that can thrive at a time when change is the only constant.



Gleaning Powerful Insights From Financial Data

A modern approach to budget monitoring can have a widespread impact on schools' decision-making capabilities.



JIM McCLURKIN
Senior Director of Public Sector
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K-12 SCHOOL DISTRICTS ACROSS the country are moving forward on their IT modernization journeys because they know technology is the key to achieving their districts' educational missions. Today's technology advances are directly supporting teachers and students, but school performance also benefits from improvements to back-office operations. Better budget management in particular can have a meaningful impact on a wide range of goals.

The latest technologies enable schools to automate routine activities, such as processing and paying invoices. An automated system can more quickly, efficiently, and accurately capture information than humans can, but even more importantly, automation opens up the ability to adopt machine learning, which can identify important patterns and trends in spending. By freeing the finance team from mundane tasks and providing richer insights into how budgets are being used, schools can plan more effectively and ensure their money is being spent wisely.

Furthermore, the Every Student Succeeds Act of 2015 requires states to provide per-student spending data to the federal government. In 2020, Lucy Hadley, Elizabeth Ross and Marguerite Roza of **Edunomics Lab**, a university-based research center, assessed states' progress

on providing that data. "It's hard to think of a time when education leaders need financial data more as they grapple with tough financial decisions for schools," they wrote. Among other benefits, data "can daylight schools that were shortchanged well before the pandemic so district leaders can prioritize their protection from cuts (or at least lessen the blow)."

The researchers also noted that to comply with the act, "some states had to devise new reporting and/or accounting protocols, train district leaders in how to assemble financials for reporting, and/or hire vendors to assemble and display the data." Fortunately, the U.S. Education Department offers a **self-diagnostic framework and an analysis tool** to help states and districts meet the act's requirements by identifying and analyzing school-level expenditure data.

Meanwhile, superintendents are hungry for actionable data. In a 2022 public opinion poll by the Data Quality Campaign (DQC) and the AASA: The School Superintendents Association, 90% of superintendents said better access to information would give them more confidence in their ability to make decisions for their districts.

"Data that is easy for all users to find, understand, and act on is paramount," said Jennifer Bell-Ellwanger, president and CEO of



DQC, in a [press release](#). “State leaders must prioritize modernizing their data systems to ensure that data works for everyone who needs it to make decisions.” In a separate document on [fiscal transparency](#), DQC states that “when school spending data is presented side by side with student outcomes data, leaders can make

better decisions about how to help students in the classroom.”

At a time when they need to make every dollar count, administrators can take the guesswork out of budget planning and management by adopting systems that help them better capture and understand data.

How Budget Transparency Fuels Modernization

Visibility into budgets and spending is an essential element of any strategy that seeks to modernize technology and education.

SUCCESSFUL MODERNIZATION begins with an honest evaluation of a school district’s current systems and an understanding of the technology changes it needs to plan and budget for so that it can increase efficiencies. A modernization strategy should also seek to eliminate technical debt, which accumulates when a district has invested in the wrong technology or when a technology has outlived its purpose.

Furthermore, optimizing budget efficiency is an essential element of achieving a district’s modernization goals and improving education. When schools decrease the amount of money they spend on administration and have greater insight into spending, they can increase the amount of resources going directly to education.

Shifting from Mundane to Value-Added Activities

During the coronavirus pandemic, school districts across the country recognized that they needed to modernize their systems to better serve students, teachers and parents. And many of those districts have begun to make progress

on their modernization journeys. However, it’s important to note that a like-for-like replacement is not an improvement because it does not take advantage of the innovation happening in the technology industry today.

By deploying technologies that streamline operations and make them more efficient, school districts enable employees to concentrate on value-added activities rather than on mundane, manual tasks. That’s because the most effective technologies rely on automation to provide near-real-time insights into where money is being spent, who’s spending it and what it’s being spent on. There’s no way to optimize a budget without that kind of transparency.

SAP Concur’s cloud platform deploys artificial intelligence, machine learning and other cutting-edge technologies to capture all the spending data within a school district. Wherever money is moving, we track it, record it and provide visibility into it. Superintendents, principals and school board members can easily pull up a dashboard to see where the district’s money is going, how cash flow is looking and whether any spending patterns require

attention. When school districts have that kind of valuable data, they can use it to create the business outcomes they want.

In addition, SAP Concur's technology is one of the links in the security chain that prevents purposeful or accidental losses of money. For example, when a charter school was breached last year, a bad actor wrote an invoice for \$1 million, and payment for that invoice was authorized. However, SAP Concur's technology caught the fraudulent transaction and stopped the payment. If our solution had not been in place, that money would have been gone forever.

Seamless Integration with Financial Systems

SAP Concur is an agnostic platform. Regardless of what financial solution a school district uses, we can interface and integrate with it at some

level to automate the movement of information into the main financial system so that all transactions are appropriately posted.

We're also a bridge technology, which means that if a district decides to change its core financial system, that change has no impact on SAP Concur. The district's technology investment with us is secure. We continue to work seamlessly with our customers' financial systems even when they upgrade an existing solution or choose a new one.

The core of SAP's mission in the K-12 space is to create an environment in which schools have transparency into where, why and how their money is being spent so that they can achieve their educational missions.

Jim McClurkin is senior director of public sector at SAP Concur.

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Collaborating Across Districts for Cyber Resiliency

When schools find ways to pool their problem-solving, they also find innovative ways to strengthen IT operations.



BRANDON SHOPP
*Group Vice President
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U.S. SCHOOL DISTRICTS HAVE publicly disclosed 1,331 cyber incidents since 2016, according to the K12 Security Information Exchange's **2022 annual cybersecurity report**. In 2021, 166 incidents affected schools in 38 states. That seems serious enough, but researchers wrote that "the true picture is surely bleaker; anecdotal evidence suggests perhaps 10 to 20 times more K-12 cyber incidents go undisclosed every year."

When it comes to cybersecurity, many K-12 schools still struggle with the basics. The best advice is to establish a good foundation that includes a strategy and process for deploying software patches as soon as they are issued. In addition, "preparedness activities... include developing and promoting policies on responsible use, storing data securely, and creating firewalls," states the **Cybersecurity for Schools Fact Sheet** published by the U.S. Education Department. "Planning teams should also consider what actions should be taken before, during, and after an incident occurs."

The message is that schools must become more proactive in their security strategies, and they can only do that if they have continuous information about how their systems are performing. A practice known as observability allows IT teams to gain real-time insights into the

usage and health of systems and applications – whether they are on-site or off-site – before users encounter a performance issue.

Taking it a step further, when schools share information with one another about the problems they are seeing and the attacks they are facing, they can crowdsource solutions and thereby boost cyber resiliency across districts and across the K-12 sector as a whole. That approach also offers a way for schools to enhance security even when funding for IT systems and staff is less than robust.

Rather than leaving under-resourced districts to tackle cybersecurity in isolation, the K12 Security Information Exchange's report concludes that "school districts should put a premium on sharing threat intelligence, sharing best practices, developing model policies, pursuing mutually beneficial risk mitigation solutions that can be deployed at scale, and educating state and federal policymakers about K-12 cybersecurity challenges and potential solutions."

Pooling resources among districts can have a powerful impact, and schools can also benefit from tapping into federal security standards, many of which offer well defined processes for responding to specific scenarios and situations. K-12 schools are considered critical infrastructure, and, accordingly, the

Cybersecurity and Infrastructure Security Agency offers a wealth of resources to help schools improve both physical security and cybersecurity. The National Institute of Standards and Technology's **Cybersecurity Framework** provides standards, guidelines, and best practices to manage cybersecurity risk. And the recent K-12 Cybersecurity Act acknowledges that

schools should not go it alone and seeks to help districts improve security with the support of government and industry.

Sharing insights into cybersecurity is foundational for protecting sensitive data, and it also ensures that students, teachers, and administrators have seamless access to the digital services and resources they need.

Observability Moves IT From Reactive to Proactive

A deeper understanding of their IT networks and the ability to share solutions can save schools time and money while improving security and performance.

THE PANDEMIC SHOWED US technology has a crucial role to play in ensuring K-12 schools can support new learning models while offering a secure, positive experience for users. Instead of reinventing the wheel, districts can learn from one another's experiences by enabling IT administrators from various districts and schools to collaborate with one another and share information on problems and solutions.

Additionally, districts should have well-defined and well-articulated strategies at the superintendent level addressing all aspects of operations, including IT. These strategies should cascade down to individual schools so they can align their strategies accordingly.

Valuable Insights Into the IT Environment

Measuring success against those shared goals hinges on ensuring schools have the tools to identify and address any issues related to connectivity, services, or applications as quickly as possible. Specifically, observability solutions can provide the ability to see and understand

what's happening inside hybrid IT environments.

Visibility gives administrators a view into how a specific application or service is performing and whether users are having problems with it. The appropriate level of visibility helps identify bottlenecks, outages, and other issues.

Observability allows for the correlation of information to provide deeper insights into why something is going wrong so administrators can determine how to fix it. Beyond addressing problems as they arise, schools should strive to get in front of them. By adding observability, administrators can begin to see problems as they emerge and address them before they impact service availability, connectivity, or performance.

Ultimately, observability enables IT administrators to become proactive instead of reactive to performance-related issues, including security. And the right visibility and observability tools help schools ensure all students can access the services and applications needed while having a positive, productive experience.

Utilizing Existing Standards

At SolarWinds, our solutions provide visibility across the essential systems involved in the delivery of a service or application. They provide insights not only into the services running in a school district's data center but also into cloud-based services such as Microsoft Office 365 and Google Workspace, as well as the learning apps students use daily.

This comprehensive view is essential for ensuring the security of an IT system. Schools can strengthen their security posture by instituting a process and strategy for deploying software patches as soon as they are issued, but they face other challenges in terms of budgets and staffing. It can be challenging for schools to hire IT security specialists because there's a limited set of people with the relevant skills, and the public sector can't compete with private-

sector salaries. This is why many schools are choosing to outsource some of their security needs to managed security service providers.

Schools should also consider tapping into federal standards providing valuable guidance on IT best practices. For example, the Common Criteria offers a framework for validating if a particular product or system satisfies a defined set of security requirements, and the federal government has created many useful product configuration standards.

By adopting the appropriate standards and tools, K-12 schools can benefit from others' expertise and speed their ability to provide IT systems to support their districts' goals for security and performance.

Brandon Shopp is group vice president for product management at SolarWinds.



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Innovative Tools for Protecting Students Online

Ensuring the well-being of students can be challenging in a time of pervasive technology. But technology also offers solutions.



COLIN McLEAN
Product Specialist
Saasyan

MOST K-12 CLASSROOMS, BOTH virtual and in-person, involve students working at computer screens. However, teachers can't always monitor what students are accessing on their devices, and that lack of visibility makes classroom management challenging. It also keeps teachers from intervening in a proactive way when online activity indicates cyberbullying, inappropriate exchanges with adults, or the potential for self-harm or other violent, dangerous activity.

Cyberbullying in particular affects a wide range of students. The StopBullying.gov website managed by the U.S. Department of Health and Human Services states that "cyberbullying includes sending, posting, or sharing negative, harmful, false, or mean content about someone else. It can include sharing personal or private information about someone else causing embarrassment or humiliation."

According to the **Centers for Disease Control and Prevention**, middle school students report the highest levels of cyberbullying, followed by high school students and then primary school students. In a 2020 study conducted by Justin Patchin and Sameer Hinduja of the **Cyberbullying Research Center**, 49.8% of tweens (9 to 12 years old) said they experienced bullying at school, and 14.5% said

they experienced bullying online. For nearly 70% of the latter group, cyberbullying made them feel bad about themselves. It also had a negative effect on their friendships, physical health, and schoolwork.

Many schools are monitoring their students' online activities so they can identify and proactively help students who are at risk of harming themselves or others. A 2022 report by the **Center for Democracy and Technology** (CDT) states that "the mental health crisis, which has been exacerbated by the COVID-19 pandemic, and concerns about the increasing number of school shootings have led to questions about the role of technology [in keeping students physically safe and supporting their mental health]. From monitoring students' public social media posts to tracking what they do in real time on their devices, technology aimed at keeping students safe is growing in popularity."

According to the **Future of Privacy Forum**, schools typically use monitoring technology to track student data on school-owned devices, school-managed internet devices (such as take-home Wi-Fi hotspots), and school-managed apps and accounts. The tools then analyze the data and flag any potential concerns. Follow-up actions include sending a warning to the student, blocking access to content, or alerting school staff.

Despite the potential benefits, the CDT report cautions that teachers need adequate training in how to respond privately and securely to the alerts so that they do not inadvertently damage students' well-being. Among other concerns, the researchers found evidence that monitoring caused the non-consensual disclosure of students' sexual

orientation or gender identity and made students reluctant to share their thoughts and feelings online.

However, schools can meet the needs of their students in ways that were unimaginable even a decade ago by keeping students' well-being uppermost in their minds when choosing how to use such innovative solutions.

Creating a Safe Learning Environment for Students

Insight into online activities gives schools the capacity to proactively intervene to improve students' well-being and academic performance

SCHOOLS HAVE FACED PRESSURE to keep up with constantly changing technology demands for years, and that pressure accelerated during the pandemic, when teachers and students had to adapt to a new online learning environment.

The majority of technological changes are positive, but they can present a few unique challenges for educators. As schools embrace new technologies and teaching models, they must ensure that they are creating a safe, productive environment for students. Improvements in the way schools monitor students' online activities can lead to better performance by helping students stay focused on their assignments and by ensuring they are free from cyberbullying and other threats.

In the past, bullying was largely isolated to the school and was often evident to the teaching staff. Now the bullying that students might experience while they're at school continues throughout the evening and weekend hours because of their online interactions. Cyberbullying interferes with students' ability to

sleep and keep up with their homework, and it can have a lasting impact.

User-Friendly, Customizable Technology

Saasyan seeks to enable schools to proactively intervene in instances of cyberbullying as well as self-harm, threats of violence, and online grooming. Our solution is designed to be used by teachers, counselors, principals, teaching assistants, and anyone else who is involved in students' well-being. A dictionary of curated words and phrases serves to define triggers for advanced alerts. Our team continuously updates the dictionary based on words and phrases added by users around the globe, and artificial intelligence helps us identify patterns and contexts and isolate any issues of concern.

For example, if a student sends a message to a peer that's potentially indicative of cyberbullying, it triggers an alert to the school. A teacher or counselor can then conduct a comprehensive online investigation of the student's activity, such as searches that have



been conducted on videos and websites that have been accessed, to see if there is a pattern of being bullied.

At a recent event in South Australia, Saasyan engaged with about 500 students and learned that more than 70% of them had been impacted firsthand by cyberbullying. It was an eye-opening number, and it prompted us to add a proactive element to our technology that enables a school counselor to set up an alert or run a report for any students who have done a search – for “how to lose weight,” for example – that might be innocent on its own but could indicate a more significant issue. The ability to customize alerts has been lifesaving in several instances.

Flexible Classroom Controls

The pervasiveness of technology in the classroom can make it difficult for teachers to

monitor what’s happening on student devices. With a quick swipe of a finger, students can quickly hide what they’re doing if they’re off task or accessing something inappropriate.

Saasyan offers flexible classroom controls that enable teachers to override firewall rules and allow access to something that might normally be blocked. Alternatively, they can block specific sites, only allow access to specific sites or even block the internet as a whole. We also offer teachers a classroom view that provides a visualization of all the online activities of their students during the previous 15 minutes.

By increasing opportunities for intervention and improving classroom management, Saasyan helps schools ensure students’ safety online and boost their educational success.

Colin McLean is a product specialist at Saasyan.



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Universities are assessing how to support students both on campus and across the country as more classes shift to online or hybrid models. Investing in elements such as cloud capabilities, video conferencing platforms, digital document and learning management systems, and cybersecurity protections are essential for building out an online presence that will attract and support virtual learners.

TECHNOLOGY FOR K-12

With intuitive learning management systems, device management, and student privacy tools, K-12 schools can ensure that online learning environments are intuitive, reliable, and secure. Pairing these capabilities with professional development and support ensures that students, educators, parents, and administrators can navigate the digital learning environment with ease.

