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**APC**

## How to Move Beyond COVID to a Truly Transformed K-12 Classroom

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## Introduction

We’ve finally moved beyond a global pandemic that changed just about everything. [According to EY-Parthenon](#), some 60% of educators adopted digital planning tools during the pandemic, and daily usage of digital instructional materials has jumped to 52% from 28% prior to the pandemic. As students and teachers have returned to in-person learning, devices in hand, has the K-12 classroom experience changed?

[Grand View Research reports](#) that the value of the global education technology (ed tech) market in 2021 was \$106.46 billion. But the market is expected to more than double, [according to HolonIQ](#). From 2022 to 2030, this market is expected to grow annually by 16.5% and expand 2.5 times from 2019 to 2025, up to \$404 billion in 2025. That is an astounding growth rate, one that demonstrates the crucial role that K-12 technology continues to play in post-pandemic classrooms.

Funding also plays a factor as K-12 budgets have increased over the last year and legislation enacted by Congress, both for COVID relief and infrastructure, provides funding for K-12 schools. These are in addition to more permanent education technology funding sources, such as E-rate. The question is how do we not only responsibly spend these funds but also how do we create a sustainable funding path for future ed tech purchases?

Finally, the nearly 100,000 public K-12 schools in the U.S. sit on 2 million acres of land and are among the largest public energy consumers, according to K12 Climate Action. It’s incumbent on today’s K-12 school districts to improve their environmental practices and get on a path to sustainability without sacrificing operational quality.

For example, energy expenditures—one of the top operating costs of K-12 districts—are ripe for reduction, both for a cleaner, greener IT environment and for a lower financial impact. One way to do that is to use network monitoring tools to monitor and reduce resource consumption.



The global ed tech market is expected more than double by 2025—an astounding growth rate that demonstrates the value that K-12 technology plays in post-pandemic classrooms.

*“...if schools are saving money on energy, which is the second highest cost behind salaries, they’re able to spend more money on teaching and learning.”*

[Future-Ed.org](#)

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## Introduction (cont.)

K-12 school districts will also seek products that themselves reduce energy impact through greater energy efficiency, fewer hazardous substances, and responsible lifecycle management.

In this e-guide, we'll look at how some of these forces impact ed tech funding. We'll also examine the need to treat K-12 IT infrastructure and uninterrupted connectivity as the critical resources they are, as well as look at potential funding sources and offer tips to create sustainability in your ed tech purchases.



### About the author

Jay Bogosian joined APC by Schneider Electric in 1997. In his current role, he is responsible for driving profitable revenue and partner enablement in collaboration with APC by Schneider Electric's State, Local and Education partners.

With 25+ years of Public Sector channel experience, Jay has an in depth of knowledge of procurement, contracts and the unique challenges associated with the public sector space. Jay holds a Bachelor of Science degree in Entrepreneurial Studies and Management from Babson College.

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## Transforming K-12 Classrooms Requires Attention to IT Infrastructure

The COVID-19 pandemic prompted a major infusion of technology into K-12 education with the forced shift to remote learning. In fact, a [recent EdWeek Research Center survey](#) found that about 85% said their districts now have enough devices to cover all students at all grade levels for in-class use.

But while technology in the wake of COVID-19 has transformed most industries, K-12 education struggles to catch up. Where ed tech investments, both pre-COVID and during COVID, mostly focused on deploying school-issued devices and piping connectivity out to students and teachers to bridge the online learning gap, the post-COVID era launches a new, though somewhat unknown, beginning.

With most teachers and students back in the classroom, with their devices in hand, what’s next for K-12 education technology?

With increased K-12 budgets for 2023, infusions of funding from the American Recovery Plan Act (ARPA), and continued E-rate funding, K-12 school districts are well positioned to transform education through technology. The question is how. Here are just some of the needs that we’re seeing:

### Device lifecycle management

With devices at or near saturation levels, districts have largely achieved their 1:1 initiatives. Going forward, they will need to implement a sustainable lifecycle management program to not only to maintain the devices they have now but also to refresh and finance new devices every two to

four years. Some ed tech leaders are looking to buyback or trade-in programs that provide a credit for new devices while sustainably disposing of older devices.

In addition, schools must also consider tools—such as mobile device management (MDM) software—to help with device management. These tools enable IT teams to automatically provision new devices, deploy new applications, and install new or updated software without having to touch each device—and give them more time to focus on the core education mission.



85% of ed tech leaders said their districts now have enough devices to cover all students at all grade levels for in-class use.

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## Transforming K-12 Classrooms Requires Attention to IT Infrastructure (cont.)

### Connectivity

But device maintenance and management are moot without sufficient Wi-Fi infrastructure to support simultaneous and/or remote users or to implement access control across multiple applications. Districts will need to extend the network out to various access points to ensure all students have both access and ample bandwidth. This will continue to be an issue as more devices and other endpoints, applications, and services are added to the network and districts struggle to house, connect, and power it all.

In addition to Wi-Fi, private 5G networks may offer IT teams the control and privacy needed to accommodate a growing number of devices and things that are connecting to the network from multiple locations—which requires even more power!

### Cybersecurity

School districts now have students and teachers accessing the network across typically distributed endpoints—from classrooms to off-site venues to their homes. And, with the increased number of K-12 threats associated with COVID, districts have become a prime target for bad actors who know that they typically have weak defenses.

Though E-rate currently funds basic firewalls as part of internet connectivity, K-12 tech leaders have said that that equipment is antiquated and leaves networks vulnerable. The FCC is currently weighing whether or not to fund more advanced cybersecurity tools, such as next-generation firewalls, anti-virus and anti-spam software, intrusion prevention and protection devices, and other tools.

### Advanced learning technologies

Personalized learning and other pedagogies that enable more innovative and engaging teaching methods and student learning experiences will increasingly rely on newer technologies like artificial intelligence, augmented reality and virtual reality (AR/VR), and others on the horizon. These advanced technologies will require not only more bandwidth but more power, too.

### Collaboration

Finally, one-off learning management systems (LMS) continue to be integrated with communication and collaboration systems to increase collaboration between and among students, teachers, administrators, parents, and other stakeholders. Google Workspace for Education and Microsoft Teams both offer not only an integrated LMS but collaboration space as well. While uptake of these systems has increased for teachers and students alike, the learning process—and the inefficiencies within—has stayed largely the same.

*“Teachers are significantly more comfortable using more digital tools across planning, instruction, and assessment as compared to pre-pandemic, and increasingly seek integrated, digital, and data-rich products.”*

[EY-Parthenon](#)

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## Powering the 21st Century K-12 “Anywhere Classroom” Requires UPS, Racks and Enclosures

If you work in a K-12 school district, you have more than likely been having lots of discussions about technology over the last few years. Maybe it’s about beefing up the wireless infrastructure, getting a higher-speed Internet connection or moving to a 1:1 computing environment.

Amid these discussions, I wonder how much you’ve talked about how and where you’re going to store all

the IT equipment it takes to deliver those services, and how to keep it all up and running in the event of a power disruption. From what I’ve seen, such discussions are not top of mind for most school districts — but they should be.

Too often when I visit a school and ask to see the server room I see a jumble of equipment — servers, routers, switches, wireless gear — sitting on shelves, with wires going every which way and, often, plenty of dust. Sometimes the equipment is tucked into the corner of a classroom, because it happens to be one of the few with air conditioning.

If your district spends tens or hundreds of thousands of dollars on IT gear that is crucial to the educational experience, it makes sense to spend a little more on some proper racks, power and cooling products to protect it.

### Power protection

[Green Premium™ power protection](#) is a good starting point. Most K-12 schools rely heavily on Internet-based resources during the day, whether it’s Google apps, Microsoft Teams, or other services. If that connection goes down, teachers must scramble to substitute another plan for the day’s lesson.

Similarly, most schools have certain applications that need to be online all the time, such as the web security tools that ensure student safety on the Web and enable administrators to ensure students aren’t surfing where they shouldn’t be.

Preventing these tools from going down requires the use of certified Green Premium “smart” uninterruptible power supply (UPS) systems with network management cards for secure monitoring and control of individual units. Many of these UPS units not only provide backup power whenever the utility power is down, they feature remote and environmental monitoring to help optimize energy efficiency.



Most schools have web security tools that enable administrators to ensure students aren’t surfing where they shouldn’t be.

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## Powering the 21st Century K-12 “Anywhere Classroom” Requires UPS, Racks and Enclosures (cont.)

Depending on where your school is located, disruptions due to weather may be frequent. It’s important to note that although school is out in the summer, weather-related power disruptions can wreak serious havoc on IT gear if it’s not properly protected — and that kind of physical damage has expensive implications.

Devices such as routers that provide Internet connections draw relatively little power, so it’s entirely feasible to install a UPS that will power them for multiple hours. Most of the time, that’s enough to get you through until the power comes back on.



Schneider Electric Green Premium will help to meet your sustainability commitments by delivering products that comply with environmental regulations, as well as transparent with environmental disclosures and end-of-life instructions.

### Racks and enclosures

Every school should also have at least one IT rack to properly house the routers, switches, storage units, servers and other IT gear. Stacking such equipment on shelves in a storage closet is risky, because it doesn’t offer the ventilation the equipment needs nor the physical security it requires.

Where space is at a premium, a purpose-built enclosure may make sense. Schneider Electric, for example, has a line of enclosures that are made to be installed in non-dedicated spaces, such as a classroom or administrative office. The [NetShelter CX](#) line, known as the “server room in a box,” enable schools to house everything they need in an attractive enclosure that looks like another piece of furniture. But they are lockable (providing the security that IT gear requires), virtually soundproof, come in various sizes, and include fans for self-ventilation.

Power protection, racks and enclosures are all eligible for rebates of 20% to 90% under the federal government E-rate program.

You spend a lot of money on the IT infrastructure required to power the 21st century classroom. It makes sense to budget a bit more for Green Premium power protection, racks or enclosures to ensure those classrooms remain online, even in the face of power disruptions.



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## Ensure Reliable K-12 Classroom Connectivity with Proper UPS Maintenance

Given how important online resources are to K-12 districts it's equally important to invest in a UPS to keep the IT equipment that supplies their Internet connections up and running in the face of a power disruption. If your district has already purchase UPS systems, you're probably already sleeping better. But there is a bit more to the story: now you may want to consider putting those UPSs on a lifecycle management program.

UPSs, or uninterruptible power supplies, are not unlike cars in that they need maintenance over their lifetime to operate reliably and efficiently. In fact, the UPS lifecycle has a lot in common with that of a car. You have to carefully consider which model is best for you, install it in an environmentally friendly environment (akin to a garage), perform maintenance at regular intervals, tune it up occasionally, and properly dispose of it when it gets old and can no longer be considered reliable.

The exact life expectancy of a UPS will depend on a number of factors, beginning with the environment in which it lives. UPSs have batteries, which are susceptible to conditions such as excessive cold, heat, humidity and dust. They work best in a clean environment at a temperature of 77°F (25°C). While the UPS will certainly operate at lower or higher temperatures, a rule of thumb is that for every 15°F (8.3°C) above that temperature, the UPS battery life is reduced by 50%.

Beyond installing it in a climate-controlled environment, UPS units periodically require attention, just as with your car (as [this infographic](#), nicely illustrates).

For UPSs that are less than 3 years old, an extended warranty helps to protect your UPS investment. While details will vary, in general the warranty should provide 24x7 technical support, free and compliant battery replacement if it dies prematurely, and safe and responsible battery disposal. It may also cover free shipping on any required replacement parts.

At 3 to 7 years old, consider replacing the UPS battery, as that's right in the wheelhouse for expected battery lifespan — again, not unlike a car battery. Your UPS vendor should be able to provide a battery that's fully assembled with instructions for how to hot-swap it, so you don't have shut down the UPS or any attached equipment. Ask for postage-paid packaging so you can recycle your old batteries.



Teachers and students rely on the internet to access the resources they need. Don't let a UPS failure put that connection in danger of failing in the face of a power disruption.



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## Ensure Reliable K-12 Classroom Connectivity with Proper UPS Maintenance (cont.)

If your UPS is more than 7 years old, it's time to think about replacing it. Newer UPSs come with advanced features, such as remote monitoring and management capabilities, extended run-time, and more. It's also a matter of reliability as well as efficiency; New Green Premium UPSs are far more energy efficient than older models, many of them having [EnergyStar](#) ratings, so you'll save on operating costs. To further ease the cost burden, some vendors (including APC by Schneider Electric) offer discounted pricing on new UPSs with your trade-in.

APC also has online tools to guide you through decisions at each phase of the UPS lifecycle. The [Service Selector](#) helps customers with newer UPSs find the most appropriate maintenance package while those with somewhat older models can use the [Upgrade Selector](#) to find a new battery. When it's time for a new UPS, the [UPS Selector](#) can help you find the right model. You can use the tools yourself or call on an APC partner to walk you through the options.

Your Internet connection needs to stay up so teachers and students can access the resources they need, when they need them. A UPS failure can put that connection in danger of failing in the face of a power disruption. Give your UPSs the attention they deserve throughout their lifecycle and they won't let you down.

### APC Trade-UPS

Trade in an old UPS, regardless of manufacturer, for 25% off a new UPS and free removal and disposal of the old unit.



Given the importance of online resources, K-12 schools should invest in a UPS to keep the IT equipment that supplies their Internet connections up and running.



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## Get the Latest on Ed Tech Funding and How to Sustain It for the Future



Thanks to millions of dollars in pandemic relief funding and increased budgets, many school districts acquired devices and resources to achieve 1:1 goals that previously seemed unattainable.

According to the National Association of State Budget Officers (NASBO), General Fund Appropriation budgets enacted for K-12 education in fiscal 2023 rose by \$27.1 billion over 2022. Many states also continue to leverage federal aid from ARPA/Elementary and Secondary School Emergency Relief (ESSER) to assist schools with creating healthy learning environments, return students to classrooms, and address local education needs. The recently passed Infrastructure Investment and Jobs Act also provides \$1 billion in grants towards cybersecurity enhancements for state and local government information systems, [according to DLT](#).

The E-rate program, however, offers more permanent funding solutions for education technology.

### E-rate

The schools and libraries universal service support program, commonly known as [the E-rate program](#), helps schools and libraries to obtain affordable broadband.

Eligible schools, school districts, and libraries may apply individually or as part of a consortium. Funding may be requested under two categories of service: category one services to a school or library (telecommunications, telecommunications services, and Internet access), and category two services that deliver Internet access within schools and libraries (internal connections, basic maintenance of internal connections, and managed

internal broadband services). Discounts for support depend on the level of poverty and whether the school or library is located in an urban or rural area. The discounts range from 20 percent to 90 percent of the costs of eligible services. E-rate program funding is based on demand up to an annual Commission-established cap of \$4.456 billion.

The E-rate program is administered by the Universal Service Administrative Company which is responsible for processing the applications for support, confirming eligibility, and reimbursing service providers and eligible schools and libraries for the discounted services.

### What does E-rate support?

E-rate supports not only the fees paid to a voice or data services provider but also the equipment that supports internal connections, as well as installation and maintenance of those connections.

In other words, if your district needs to install wireless access points, routers, switches, and cabling to support Internet connectivity, that's all eligible. Same goes for the phone systems that connect to voice services. Racks to house hardware are likewise eligible, as are the power distribution units (PDUs) and uninterruptible power supplies (UPSs) that ensure all that equipment has reliable power—a crucial consideration given how much schools rely on their online services. Need help from a service provider to install all that gear? That's covered, too.

E-Rate can dramatically change the ROI equations for school technology initiatives, making projects that once seemed out of reach eminently feasible.



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## Get the Latest on Ed Tech Funding and How to Sustain It for the Future (cont.)



What’s more, it’s not a one-time deal. The program has been in place for 20 years and many districts will need to update services and technologies for which they’ve already received E-Rate funds. Fortunately, there’s no limit on the number of times you can request rebates for eligible services and equipment.

### Tips for a sustainable ed tech program

While federal and state funds, like E-rate, will continue to provide funding, ARPA funding will end in 2024 (projected end date for ESSER II funding is September 2023 and ESSER III is September 2024). With an uncertain economy ahead, [EdTechMagazine.com](https://www.edtechmagazine.com) [advises](#) districts to plan for reduced K-12 budgets that will likely force cuts in hardware, applications, and services. But how can districts make a transformational impact on learning while putting themselves on a sustainable path to new technologies?

Consider forward-funding contracts, as well as these alternative ways from [EdTechMagazine.com](https://www.edtechmagazine.com) to sustain ed tech investments:

- Stop funding outdated, ineffective, or rarely used programs or technologies.
- Use zero-based budgeting strategies to further scrutinize where funds are directed.
- Harness the efficiencies that newer technology tools provide.
- Reconsider traditional instructional delivery models in light of newer technologies.

To drive digital transformation, they also recommend tying investments back to the value of student learning—and that starts with a clear picture of spending across your

district. Look to technology solution providers to provide ROI analyses to demonstrate value. They can also help you save money through optimization, automation, secure data management, single sign-on, and advanced data analytics.

Finally, if you’re not getting the answers you need, consider another solution provider—or consider whether that service, solution or product continues to provide value.

For over 40 years, APC has been dedicated to serving K-12 schools and providing a comprehensive portfolio to support their IT infrastructure needs. Among their offerings are the highly sought-after Smart-UPS™ with lead acid or lithium-ion batteries. Recently, APC introduced two new products: the [Smart-UPS Ultra](#), smaller with more power, and the [Smart-UPS Modular Ultra](#), with scalable capacity. These innovative solutions are designed specifically for K-12 schools’ where IT space is limited and feature simplified remote monitoring and management via [EcoStruxure™ IT](#). Additionally, they can be seamlessly integrated into classroom-ready and network-closet-friendly IT racks, such as NetShelter Soundproof Racks or NetShelter Wallmount Enclosures.

To learn about some of the APC solutions for K-12, [visit the APC Education page](#).

### Additional Resources:

- » [APC Education Solutions](#)
- » [APC Education Blog Posts](#)