# CHANNEL BYTES

# From Chalkboards to Wi-Fi Signals:

## The Digital Transformation of K-12 Education

**Why good connectivity is pivotal for education in the modern world, a ChannelBytes perspective.**

**The significance of digital infrastructure in education is underscored by the US Department of Education. However, it is crucial to recognize that enhancing infrastructure goes beyond merely granting students access to technology. The focus should be on harnessing technology to bolster the entire education system—enhancing administrative processes, offering support for educators, and creating avenues for students to avail themselves of assisted tutoring and additional educational resources.**

To realize these objectives, digital infrastructure must be both accessible and adaptable to accommodate varying levels of usage, especially during peak demand times. Security stands out as a critical consideration, with schools requiring robust measures to safeguard both their assets and the personal information of teachers and students.

At the core of enhancing the educational experience for everyone in K-12 schools lies the imperative to upgrade digital infrastructure. However, given the multitude of available options and the rapid pace of technological advancement, identifying the right solution necessitates thoughtful consideration.

For schools seeking to upgrade their digital infrastructure, this report offers valuable insights. It examines:

- Trends shaping transformations in K-12 education

- Key challenges in K-12 schools regarding digital infrastructure

- Important considerations when making decisions on digital infrastructure

- Strategies employed by schools for successful digital infrastructure upgrades

A recent report highlights that only 67% of K-12 schools have met the required bandwidth, signifying progress. However, the remaining third of schools, encompassing approximately 23 million students, still lack the advantages of sufficient digital infrastructure.[1]

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1 Connect K-12's 2022 report shows 67% of U.S. school districts now meet FCC Internet Connectivity Benchmark. Connected Nation. (n.d.).

## Leading Trends in K-12 Schools

As academic results witness a decline, with a 7-point drop in average math scores since the COVID-19 pandemic[2], schools acknowledge the urgent imperative for change to facilitate recovery. Educational leaders are prioritizing this shift, focusing on identifying the necessary measures to support and enhance education for improved outcomes.

Over the past three years, students and teachers have navigated various adaptations, taking a toll on their well-being[3]. This strain is reflected in an increasing number of teachers contemplating leaving the profession, while more students express feelings of exclusion and being unheard. There is a growing acknowledgment that addressing the social, emotional, and physical needs of students is integral to fostering an effective learning environment.

As the dynamics of interaction and engagement evolve, there's a recognition that a one-size-fits-all approach is neither effective nor necessary. An opportunity exists to enhance the quality and design of instruction through personalized approaches, leveraging technology. To realize this potential, schools must ensure the presence of the right digital infrastructure to effectively support the envisioned plans for change.

## Current Challenges in K-12 Schools

Although the primary mission of K-12 schools centers on education, numerous institutions encounter difficulties in achieving this goal due to insufficient digital infrastructure support. This becomes evident during crucial moments like exams, where system failures and unreliable Wi-Fi access contribute to student disengagement, impeding their access to essential information.

Amidst the challenges faced by educational institutions in adopting digital infrastructure, cost constraints, and budget limitations emerge as significant barriers. The intricate landscape of technology integration is further complicated by the scarcity of access to IT expertise. Schools often hesitate to allocate their limited budgets to technology investments, grappling with uncertainties about their specific needs and navigating the selection process among various products and brands. This financial predicament is exacerbated by the fact that 70% of K-12 administrators identify funding as the primary obstacle to program evaluation[4]. These findings underscore the pervasive impact of financial considerations on schools' ability to embrace and effectively evaluate technology solutions for educational enhancement.

2, 3, 4 Amanda Taylor, M. L. (2023, June 26). 2023 trends in K-12 Education. Hanover Research.

Adding to the complexity is the challenge of security and the delicate balance of leveraging technology to enhance it without introducing additional risks. Beyond safeguarding student privacy, there's a critical need to secure educational assets, such as learning resources and test scores. The objective is to ensure these assets remain untampered and protected from misuse.

While it's largely understood that aging infrastructure can result in cybersecurity vulnerabilities[5], keeping ahead of risks is an almost impossible task. The rapid pace of technological advancement further complicates decision-making around investing in new digital infrastructure, as the awareness persists that newer versions will soon be available.

Addressing these challenges can be facilitated by collaborating with a technology partner specializing in educational environments. Roeing IT Solutions, a Managed Service Provider (MSP) based in Indiana with a 25-year track record, has established itself as a reliable collaborator with schools. Recognized in the education market as a trusted ally, Roeing excels in navigating technological transformations. Their extensive experience not only caters to digital infrastructure needs but also effectively addresses and resolves various IT challenges. Beyond conventional troubleshooting, Roeing provides insightful guidance on leveraging technology for additional benefits, enhancing overall support for K-12 schools.

Roeing IT Solutions goes beyond mere problem-solving, offering valuable insights into harnessing technology for additional benefits, thereby elevating the overall support provided to K-12 schools.

5 K-12 Digital Infrastructure Brief: Adequate and future proof. (n.d.).

# Vital Considerations for Successful Digital Implementation in K-12 Schools

## Be Clear on Why Technology Investments Are Necessary

In today's tech-centric lifestyles, reliable access and connectivity are deemed essential by the majority of young people. For schools aiming to capture and maintain student engagement in learning, leveraging technology in a manner that resonates with students is crucial.

Recognizing the transformative potential, even authorities and industry organizations acknowledge that technology can act as a catalyst for improving the quality and accessibility of education, especially in poorer and disadvantaged communities. However, realizing these benefits hinges on the presence of dependable digital infrastructure.

It is noteworthy that the Federal Communications Commission (FCC) has set specific goals for broadband access in schools, aiming to ensure a minimum standard of connectivity. Recent data reveals a significant disparity, with districts not meeting the FCC goal paying a higher median price per megabit — $1.75 per Mbps, compared with $0.97 Mbps for those meeting the goal[6]. This emphasizes the critical need for strategic investments in digital infrastructure to bridge the accessibility gap and enable schools to fully harness the educational potential of technology.

## Take Advantage of Funding Programs

The E-Rate program was instituted to assist schools and libraries in obtaining reliable broadband access. This initiative provides funding and discounts, varying based on urban or rural location and the poverty level of the local community surrounding schools.

## The discounts range from 20 percent to 90 percent of the costs of eligible services[7].

It's clear in our research that partnering with a certified E-Rate providers, such as Roeing IT Solutions, for digital infrastructure upgrades ensures that schools receive tailored technology solutions. This collaboration not only offers support throughout the application process but also assures that the implemented technology will truly enhance the educational experience. The flexibility of the E-Rate program's discount structure enables schools in diverse settings to bridge the digital divide and provide students with the connectivity and resources necessary for a well-rounded education.

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6 Connect K-12's 2022 report shows 67% of U.S. school districts now meet FCC Internet Connectivity Benchmark. Connected Nation. (n.d.).
7 E-rate - schools & libraries USF Program. Federal Communications Commission. (n.d.).
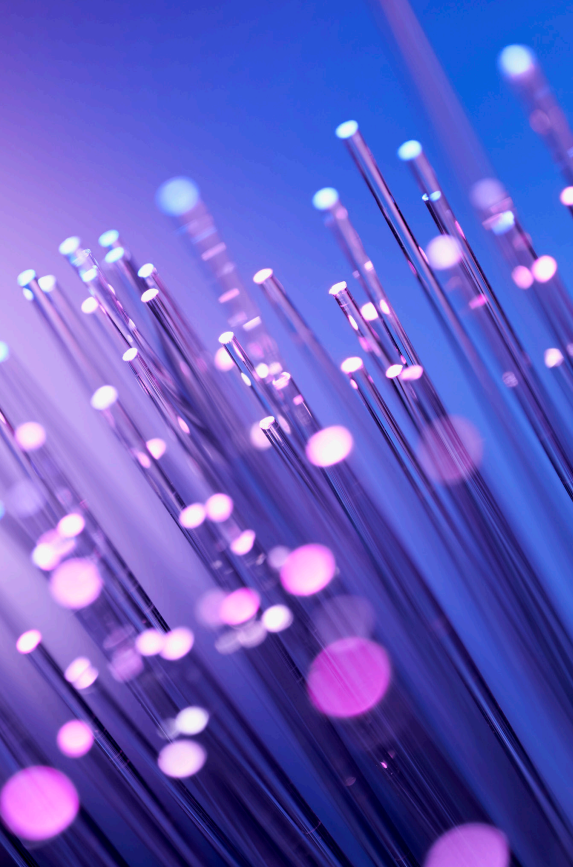
## Understand Networking Usage and Options

Enhancing network performance goes beyond simple hardware replacements, involving a comprehensive understanding of network usage, program requirements, average and peak usage patterns, as well as considerations for access and security. Future-proofing is a critical aspect, necessitating an assessment of potential shifts in technology, program preferences, and user volumes[8]. With the rapid evolution of technology, network upgrades must be implemented with an eye toward future considerations.

In the dynamic realm of educational technology, establishing hardware replacement cycles is more than routine maintenance—it's a strategic commitment to future-proofing. Adhering to 3-4-year cycles for devices and 5-year cycles[9] for networking hardware ensures optimized performance today while anticipating tomorrow's demands. Beyond mere upkeep, it's about fostering a culture of perpetual innovation and preparedness.

This proactive mindset, coupled with partnerships with leading Managed Service Providers like Roeing IT Solutions, ensures that educational networks not only meet current challenges but remain resilient and adaptable to the evolving landscape of technology.

In the ever-changing landscape of education technology, choosing the right consulting partner and technology is pivotal. Collaborating with a Managed Service Provider (MSP) like Roeing IT Solutions offers more than just hardware installation. An experienced MSP provides ongoing support, security updates, and valuable insights for effective technology utilization. As a RUCKUS Networks partner, Roeing IT Solutions, with over 44 years of experience, brings specialized expertise in networking solutions tailored for K-12 schools. The integration of RUCKUS AI enhances issue resolution, ensuring an uninterrupted learning experience. This partnership is a commitment to continuous improvement, security, and maximizing the potential of innovative solutions in education.

# Proof that Winning at Connectivity Enhances Education

In our research, we've observed the impactful collaboration between partnerships. As a local technology partner based in Indiana, Roeing IT Solution's work with dozens of schools has significantly improved connectivity. This local connection provides schools with a unique advantage—a trusted partner in their neighborhood, well-acquainted with the educational landscape. This partnership exemplifies how a local ally, deeply rooted in the community, can positively transform education, setting a precedent for similar collaborations nationwide:

### SAT Success:

A centralized configuration facilitated by Roeing IT Solutions, including six RUCKUS access points and 10GB switches ensured seamless connectivity for over 210 students during SATs. This setup not only allowed students to concentrate without disruptions but also eased administrators' worries about network issues. The versatile infrastructure was also employed for robotics and public use, highlighting how a single network upgrade can greatly enhance support for various educational activities.

8, 9 K-12 Digital Infrastructure Brief: Adequate and future proof. (n.d.).

## Network Upgrade Success:

Dealing with an unreliable wireless network, a school needed a solid solution to fix the issues. Roeing IT Solutions stepped in and ran a practical test, using RUCKUS AI to get a thorough understanding of the existing network problems. By combining insights from the AI analysis with data from a wireless survey, Roeing IT Solutions designed and put in place a customized RUCKUS networking solution for the school. Since the changes, the school now has quick and dependable wireless connectivity, putting an end to the problems that were causing disruptions before.

## Network Troubleshooting Success:

After a network upgrade, a school faced lingering issues. Roeing IT Solutions used RUCKUS AI for thorough testing and troubleshooting, discovering that the problem originated from an improperly configured Mobile Device Management (MDM) system, requiring rule adjustments. With the capacity to pinpoint and guide the school through implementing a solution, Roeing IT Solutions effectively resolved the issues. As a result, the school experienced the anticipated benefits of a more reliable and improved connectivity post the network upgrade.

## Keeping Ahead with Technology Trends:

In the dynamic landscape of education technology, the timely adoption of innovations holds profound benefits for both students and educators. Roeing IT Solution's proactive approach in embracing wireless solutions, steering away from conventional cabled networks, reflects a strategic response to the evolving educational environment. Beyond mere infrastructure enhancement, a valuable MSP recognizes the importance of fortifying network security against emerging cyber threats and modernizing classroom tools. This extends to transitioning from traditional projectors to more interactive and expansive screens, fostering a richer learning experience.

## Elevating Connectivity Standards with Partnerships

Through a longstanding and respected partnership, Roeing IT Solutions has earned certification as an Elite RUCKUS Partner. With dedicated RUCKUS technicians specializing in the nuances of RUCKUS networking solutions, Roeing IT Solutions excels in delivering robust technical support and creating tailored solutions, mindful of the budget constraints often faced by schools. Roeing IT Solutions has shown leadership in E-Rate sales, highlighting its steadfast commitment to providing significant value and benefits to the education sector.

# Conclusion

Recognizing the diverse ways in which students learn and the individualized pace at which they progress, the contemporary approach to education underscores the importance of adaptability. Technology plays a pivotal role by empowering teachers to enhance education on a broader scale, while simultaneously affording schools the flexibility to personalize the learning experience as needed.

The importance lies in seemingly simple factors, such as having a network robust enough to withstand peak usage during exam times. Additionally, having a network that accommodates new and emerging technologies is crucial, enabling schools to leverage these advancements for the enhancement of education. Establishing reliable and accessible digital infrastructure is pivotal for the advancement of education. Our parting "Byte", do your research, have the right partner, use the right technology and focus on the needs of today and tomorrow.