Top Trends in K-12 Education for 2024

Published 25 January 2024 - ID G00805930 - 26 min read

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> The digitization of K-12 education worldwide has created opportunities and challenges. To deliver on the organization's 2024 mission, K-12 education CIOs should focus on key trends that impact teaching and learning, global student unpreparedness, and faculty and IT staff shortages.

Overview

Opportunities

- Post-COVID-19-pandemic digitalization has increased efficiency with technology and generative AI (GenAI) promises new ways of teaching and learning. We are also seeing security and surveillance systems that leverage technology to improve school safety. However, this increasing use of technology has exposed the school ecosystem to increased risks such as ransomware.

- Learning losses, perceived student underpreparedness for college or the workforce, and the declining half-life of skills have increased the pressure on K-12 education to demonstrate learning, ensure progression and advance readiness for postsecondary endeavors among students.

- Faculty and IT staff shortages continue to be felt across the globe, albeit unevenly, impacting not only student recovery but also hiring standards, instruction and IT organization. As digital solutions become increasingly integrated into the workforce, these solutions offer opportunities to alleviate these major challenges.

Recommendations

K-12 CIOs responsible for education technology optimization and modernization should:

- Secure the school environment by setting up partnerships across academics, IT and facilities/estate teams. The mission is to identify and maintain a technology portfolio that supports institutional requirements for digital security and well-being on campus in increasingly integrated digital and physical school safety designs.

- Support student progression by developing a comprehensive strategy and roadmap, in partnership with relevant stakeholders, to equip, educate and enable teachers, administrators, students and parents to leverage digital tools in the classroom. This will promote confidence in data and its potential to demonstrate and recognize learning.

- Strengthen school operations by identifying current operational gaps at your institution and enlisting the use of relevant tools and strategies to:

  - Lighten the workload of faculty and administrative staff.

  - Streamline and automate current processes and services.

  - Determine what is no longer of sufficient value and should be removed from your services catalog.

What You Need to Know

Balancing Expectations of the Future With Gaps of the Past — How Can IT Help?

In 2024, K-12 education finds itself at an interesting crossroads. It must be ready for the expectations of a fast-changing society and economy while still reconciling postpandemic impacts. Educators, administrators and guardians find themselves simultaneously pulled in opposite directions while ensuring to continue with business as usual. CIOs must therefore balance technology demands to ensure:

- Data and security

- Pressures of resource availability and need for automation

- Engagement and learning outcomes that address learning gaps and student/staff well-being

K-12 education must address three pillars that involve multiple challenges and opportunities. These are (see Figure 1):

- Secure school environment

- Strengthen school operations

- Support student progression

Figure 1: Top Trends in K-12 Education for 2024

Top Trends in K-12 Education for 2024

Source: Gartner
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Gartner.

Table 1: Trends Profiles

Secure School Environment	Strengthen School Operations	Support Student Progression
Safety and Well-being of Students and Staff	Workforce Challenge — Teacher Availability and Appropriateness	Demonstrable Learning
Ransomware in K-12 Education	Automation — Within and Outside the Classroom	Learning Insights — Gapalytics and Recognition

Source: Gartner

Globally, there is a marked shift from linear education and career paths to a dynamic landscape. [1] Agile and staggered or phased learning, along with continuous upskilling, are becoming imperative to better address the needs of a knowledge economy where artificial intelligence and automation are becoming ubiquitous. To enable this, the global K-12 sector which plays a foundational role in this evolving circuit requires:

- Safe environments for individuals to thrive in, including teachers, students and staff.

- A workplace where employees feel motivated to perform by promoting recognition and growth opportunities.

- An education system that is agile enough to respond to the socioeconomic and political currents while granular enough to motivate and support each student's progression through K-12.

As K-12 education prepares students for a future that is increasingly digital and shaped by AI, the opportunities, potential and interconnection between technology and education to promote the above endeavors is essential. [2]

AI Readiness — Not a Trend Yet

This research focuses on business and technology trends impacting K-12 education globally, albeit in varying measures. AI in general and GenAI have immense potential to impact education. This is evidenced by a 40% increase in Gartner K-12 client interactions (January 2022 to December 2023) on AI strategy and solutions. However, a recent report from the United Nations Educational, Scientific and Cultural Organization (UNESCO) suggests that less than 10% of schools and universities have adopted formal institutional guidance on the use of popular AI tools. [3]

The lack of adequate AI guardrails and guidance, combined with the growing invisibility and everyday-ness of AI, means that these powerful technologies pose the risk of being integrated into K-12 education, but not necessarily in ways that the educators ask for or may be aware of. [4]

This could mean unsanctioned or undisclosed use of data, potentially raising security and privacy concerns, especially for minors. For K-12 education educators to appropriately adopt AI, three capabilities need to be in place. They need to:

- Harness the full potential of AI by aligning it to organizational challenges and opportunities.

- Implement the technology responsibly to ensure secure and ethical use of data.

- Prepare students for the AI-driven future by systematically implementing it in the learning ecosystem.

To achieve these three objectives, all K-12 stakeholders must invest in building AI literacy, skill building and training. Right now, K-12 education is only seeing this kind of investment in small, varied pockets.

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Analysis by Michael Brown, Robert Yanckello and Saher Mahmood

Description:

School security takes the form of guards, physical access control and technology. Guards may be law enforcement officers who are armed or private security that may or may not be armed. Physical access control involves fencing, classroom door locks and controlled building access. Technology can involve weapons detection, panic buttons, video systems and direct communications with law enforcement agencies.

Why Trending:

Since 2008, 620 school shootings have occurred in the U.S. [5] While this number crosses both higher education and K-12, the overwhelming majority of incidents (65%) in the last year were at K-12 schools. Incidents include the 2018 shooting at Marjory Stoneman Douglas High School in Parkland, Florida, which resulted in 17 deaths, and the 2022 shooting at Robb Elementary School in Uvalde, Texas, in which 19 were killed. Such incidents have energized state and federal governments to pass a variety of statutes and security funding measures. Examples of new laws include the federal STOP School Violence Act of 2018 and the Bipartisan Safer Communities Act of 2022, which alone provided more than a billion dollars to address school safety. [6] While the risk associated with travel to and from school, disease and sports injury collectively exceeds that of school shootings, society's horror and governmental reaction to shooting events has produced a U.S. market for school security valued at more than $3 billion. [7,8]

Implications:

- **Budget**. School budgets are expanding, or making educational trade-offs, to accommodate security spending. The $3 billion market cited earlier does not include the U.S. spending of $2.5 billion for school resource officers and $12 billion for private security. [9] Increased school choice has been proposed by some as a way to address security, which, if widely implemented, could have a profound impact on public school budgets. [10, 11]

- **Skills and training.** School educators and administrators have myriad responsibilities today. The traditional challenges of delivering educational content, curriculum development, overseeing extracurricular programs, care and feeding of students, facility management and personnel management must now include training and expertise in security. Lockdown drills, regular coordination and drills with emergency responders, and operation of security technology systems are now necessary additional burdens for educators and administrators.

- **Environment and culture.** Video monitoring, locked doors, weapon detection, increased security officer presence, and even the design of hallways are changing the climate of schools. [12] While perhaps necessary, the culture is shifting toward a fortress perspective coupled with a persistent indication of imminent danger.

- **Technology choices.** Not all possible security technology is likely to be practical, if for no other reason than budget constraints. Urban schools and rural or suburban schools will have different needs and priorities. Communication technology and panic systems may be appropriate for all school settings, whereas video surveillance may be more critical in some settings. [13]

Actions:

- Collaborate with school administrators to balance security costs and security technology choices with traditional programs. Work with appropriation authorities, law enforcement, parents and stakeholders to establish priorities and plans that promptly address common protocols and long-term expectations.

- Develop necessary security awareness and skills by establishing in-service training requirements for staff, students and parents/guardians.

- Develop a cohesive approach to security by ensuring technology choices and operational plans are integrated.

- Maintain security capabilities and readiness, but diminish a fortress and siege perspective by continuing to emphasize the primary educational mission.

Further Reading:

Hype Cycle for Public Safety and Law Enforcement, 2023

Emerging Tech Impact Radar: Computer Vision

Ransomware in K-12 Education

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Analysis by Paul Furtado

SPA: K-12 education will remain a prime target for ransomware through 2028.

Description:

Ransomware is a type of cyber extortion where a malicious actor infiltrates an environment and encrypts and exfiltrates files, denying access and threatening disclosure, unless the victim pays a ransom.

Why Trending:

According to the Center for Internet Security (CIS), K-12 education was the most targeted industry sector in 2022-23. [14]

There has been more than a 30% quarter-over-quarter increase in cyberattacks against K-12 schools since the end of 2022. The CIS report suggests attacks on K-12 schools in the U.S. are on a near-weekly basis. [14]

Implications:

Former United States Secretary of Commerce Gina Raimondo said "The first thing we have to recognize is this is the reality, and we should assume, and businesses should assume, that these attacks are here to stay and, if anything, will intensify." The reality is that school districts must prepare for their networks to be targeted by a ransomware attack and be prepared for an acceptable level of response.

- **According to a report** from the U.S. Government Accountability Office, when a K-12 school district is impacted by a ransomware attack, the district can expect anywhere from three days to three weeks of learning loss. [15]

- **Recovery of all services** to preincident levels takes several weeks or months depending on the size of the school district and level of infection across all assets. Some school districts have experienced permanent loss of certain datasets.

- **Some data breaches** have resulted in the personal data of students, faculty and staff being posted on the dark web and public internet. Additionally, bad actors have targeted individuals specifically with ransom demands to "protect" their personal data.

- **Impact in K-12 environments** is significant due to the flat network architecture that is typically found in some school districts. This allows the malware ease of lateral movement and greater penetration of critical systems and applications.

- **In its 2023 annual survey,** the Consortium for School Networking found that 66% of districts lack a full-time cybersecurity position. [16] Threat actors know that the education sector employs the fewest security employees when compared to other industries (see IT Key Metrics Data 2024: Industry Measures — Education Analysis). [17] This reduced staffing typically results in gaps in monitoring, which can lead to delayed incident response.

Actions:

To successfully defend and respond to a ransomware attack, CIOs and security leaders in K-12 must:

- Be prepared to respond quickly and effectively by developing a comprehensive incident response plan (IRP). The plan must include a ransomware playbook to augment the IRP and lockdown endpoints that prevent access to a command prompt that prevents running Microsoft PowerShell scripts.

- Enable monitoring of endpoints to protect against process thread sprawl. Deploy strong endpoint protection to limit against lateral spread of malware.

- Segment student and faculty/employee networks. Stay vigilant with patching and vulnerability management. Enable stronger security to mitigate account breaches by implementing multifactor authentication for all faculty/staff accounts.

- Implement strong network monitoring with traffic analytics to identify deployed payloads quickly. Control outbound access routing to limit connectivity to known care-and-control domains. Augment internal staff with external resources (e.g., managed security service providers [MSSP], managed detection and response [MDR], and endpoint detection and response [EDR]).

- Consider creating a cybersecurity consortium with other districts to potentially share costs associated with monitoring, response and threat intelligence. This can also include the sharing of the chief information security officer role or other expertise across multiple districts. Leverage free services, tools or credits for K-12 initiatives offered by some vendors by checking with your existing vendors about their programs for K-12.

Further Reading:

Toolkit: Creating a Ransomware Playbook

Quick Answer: How Can CISOs Reduce Downtime During a Ransomware Attack?

The Gartner Framework for Ransomware Recovery

Ransomware Recovery Requires a Layered Recovery Response

Strengthen School Operations

Workforce Challenge — Teacher Availability and Appropriateness

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Analysis by Saher Mahmood, Kelly Calhoun Williams and Tony Sheehan

Description:

The K-12 teacher workforce is facing shortages worldwide. Long-standing issues of burnout, low pay, plummeting pipelines, early retirement and aging demography have been exacerbated by the pandemic. To meet this challenge, some states are lowering certification requirements for teachers or hiring underqualified staff. However, this is likely to adversely impact student safety and recovery from the COVID-19 pandemic-related learning loss.

Why Trending:

- According to UNESCO, 44 million more teachers are needed to achieve the goal of providing primary and secondary education for all by 2030. [18]

- In the United States, 44% of public schools were operating without a full teaching staff at the end of 2022, with a larger percentage in high poverty neighborhoods. [19] Similarly, the Australian education system predicts a shortage of 4,000 teachers by 2025. [20]

- Unattractiveness of the profession has led to an aging demographic of teachers and a dwindling pipeline. In the United States, the average age of public school teachers is 43 years, with more than a quarter being over 50 years of age. [21]

- According to the Organisation for Economic Co-operation and Development (OECD), at the primary school level, 60% of teachers are over 50 in Italy, 37% in Germany, 42% in Portugal, 36% in Sweden and 23% in France. [22,23]

- Teacher shortages are leading to overpopulated classrooms and heavy reliance on substitutes. Some classrooms use novel arrangements like "Zoom in a room" as short- to medium-term solutions. This scenario entails virtual teachers in a physical classroom, often consisting of more than one class. While that option helps meet the challenge for districts with little choice, it is not the answer and raises further concerns for K-12 education. [24]

- At a policy level, relaxing the credentialing standards or fast-tracking the process with for-profit online training providers has been seen. This is likely to have unanticipated implications for K-12 education and therefore must be monitored closely to ensure standards are maintained and learning is delivered. [25]

Implications:

- **Learning outcomes.** Students perform better under university-certified teachers compared to alternatively trained teachers who also tend to have lower retention rates. [26] Additionally, looping in the same teacher over multiple years for a student has shown significant gains in math and reading. [27] As education systems struggle to bridge uneven learning, compounded by the COVID-19 pandemic, the lack of appropriately trained teachers in the classroom can further slow down learning recovery, impacting postsecondary readiness.

- **Equity and access.** Recent studies indicate that neighborhoods with high poverty and high minority numbers as well as those in rural areas are associated with higher teacher shortages. The inequitable access to qualified teachers will only widen the existing achievement gap for underserved communities. [28]

- **Security and accountability.** Classes taught by substitutes and privately leased virtual teachers may require enhanced classroom infrastructure, including IT investments while creating a lack of clarity on who is accountable for student performance. Undersupervised classrooms may also create student safety issues, requiring investment in surveillance infrastructure to monitor classroom movement. [29]

Actions:

- Analyze. Begin identifying the extent of the problem in your district. Support the human resources department by leveraging analytics to spot patterns in key metrics, such as the scale of shortage, patterns in turnover, struggling teachers, or other critical indicators identified by the stakeholders.

- Retain. Build retention strategies that reduce teacher workload and vulnerabilities by partnering with academic and human resources teams to leverage technology, such as automation within and outside the classroom.

- Incentivize. Communicate and promote your district's professional development programs by introducing credentialing solutions or technologies for automated nudging at the optimal time to improve teacher engagement and recruitment. This may translate into enhanced satisfaction at the workplace.

Further Reading:

Retain and Improve Employee Performance Through Fairness

Quick Answer: How Can K-12 Education Get Ready for Conversational AI User Interfaces?

Automation — Within and Outside the Classroom

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Analysis by Terri-Lynn Thayer and Saher Mahmood

Description:

In K-12 education, automation within the classroom streamlines teaching, learning and assessment activities with personalized instruction, adaptive assessments, reduced manual tasks for the teacher and improved student insights. Outside the classroom, automation can strengthen everyday operations, administration and back-office processes with use cases, including security, communication, data and business intelligence. When approached cohesively and strategically, this business and operational automation can accelerate institutional performance.

Why Trending:

- Digital solutions can help scale up efforts to address the challenge of learning loss. Software to automate classroom activities like personalized instruction and assessment with adaptive learning tools, autograding, real-time translation and feedback features, and predictive analytics on student performance is increasing in the market.

- Pressure on schools to do more with less (money, faculty, and staff) has made productivity improvement for business and back-office practices a mission-critical initiative.

- The need for improved data quality, security and usability are driving efforts to digitize many previously analog business processes.

- Automation technologies have matured and are now viable solutions for reducing the effort, time, cost and errors typically associated with back-office and student/parent-facing tasks.

- AI-powered automation has improved the accuracy, efficiency and user-friendliness of business and operational tools, and their potential to help achieve desired outcomes.

Implications:

- **The intuitive and user-friendly interface** of GenAI promises a whole new range of market offerings for automation tools for personalizing instruction and assessment. This may lead to more decentralized or autonomous use of AI-powered tools at the classroom level.

- **Gartner predicts that by 2028,** 50% of K-12 organizations will use multiple systems and applications across classrooms and administration that include a conversational AI or GenAI user interface. [30]

- **Market offerings that address** K-12 business-specific workflow automation are increasing. This solution space includes purpose-built automation solutions and enhancements to ERP, student information systems (SISs) and other administrative software to enable automation.

- **Increased use of business process analysis** in order to identify the processes that are most likely to be improved and achieve desired business outcomes. Care must be taken not to overautomate by identifying processes that should remain human-centered interactions.

- **The growth of AI-powered automation** may bring workflows within and outside the classroom, sometimes unrelated, closer together.

- **If not evaluated and implemented correctly,** the potential for performance achieved through AI-powered automation will be undermined by issues of risk, security, bias and privacy.

Actions:

- Track the business value of automation within and outside the classroom by capturing the before and after automation impact on:

  - Time and effort to complete tasks

  - Cost saving and cost avoidance

  - Error reduction and data quality improvement

  - Increased compliance and risk reduction

  - Reduced paper

  - Increased student, parent, teacher, and staff satisfaction/experience

- Communicate the financial, operational and academic value of automation to relevant stakeholders, including administrators, teachers and parents, by involving them in relevant impact-assessment projects. Doing so could hasten technology adoption.

- Strengthen the potential for automation by developing a cohesive strategy and a roadmap that aligns the initiatives within and outside the classroom where applicable, instead of mutually exclusive or distinct workflows.

Further Reading:

4 Steps to Hyperautomation Success in Higher Education

Case Study: AI Recommendation Engine to Increase Graduation Rates

Case Study: Predictive Analytics That Foster Student Success in K-12 Education

Support Student Progression

Demonstrable Learning

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Analysis by Saher Mahmood and Marlena Brown

Description:

Demonstrable learning is the verifiable proof and measurable value of knowledge, technical and soft skills or competency acquired by an individual.

Why Trending:

The COVID-19 pandemic has had a two-pronged impact on K-12 education. First, it has created learning gaps, with an estimated 10-year projection to restore to prepandemic levels. [31] Second, the ensuing digitization has created a global network of information exchange and credentialing, disrupting the traditional K-12-to-college choices and diversification of career pathways. [32] Three broad trends have emerged:

1. Vocational and STEM courses that promise a career path that doesn't require a traditional four-year degree are on the rise. In the U.S., over 50% of high school students (approximately 8.3 million) participated in career and technology education programs in 2020-2021, according to the U.S. Department of Education. [33]

2. Private-sector entities are making forays into secondary and postsecondary levels, offering programs and certificates to close the skill gaps and build a talent pipeline in emerging technologies, especially AI. [34]

3. Geopolitical trends and a global race for innovation and technical talent are two forces leading to public-sector demand for accelerated learning in K-12, which can support a robust workforce pipeline. [35]

These trends make demonstrable learning that can justify student progression, within and beyond school, more critical than ever before.

Implications:

- **Personalization** that supports individual needs for social and professional preparedness will see a growing demand. For instance:

  - Parents expect more from K-12 education to provide support to students for individual learning and mastery over standardized learning. [36] To meet this expectation, an acceleration of digital strategy will be required.

  - Vendors are offering GenAI-powered capabilities that can personalize curriculum development, content consumption and assessments.

- **Data systems** that help organizations track student learning, performance and progression longitudinally through K-12 may see a growing demand. This can:

  - Help schools offer granular insights on low engagement and at-risk students with early intervention to positively impact learning outcomes and retention.

  - Incentivize market solutions that provide predictive, and eventually prescriptive analytics, for optimal progression and postsecondary choices. [37]

- **Gamification** of learning can support and enhance traditional instruction models in bridging the learning gap effectively. [38] Two developments can be seen:

  - School systems are experimenting with gamification in formal curriculum to not only increase engagement for academic learning but also to potentially develop and demonstrate desirable soft skills. These include strategy, critical thinking and even tangible skills like financial planning. [39]

  - Noneducation entities are gradually entering the informal education space, targeting parents via digital platforms that build communities of gamified learning. [40]

- **Vocational education** will see a steady uptick in K-12 education. The World Economic Forum predicts the creation of 3 million additional jobs in the education industry between 2023-2027, as a result of the impact of economic, health and geopolitical trends on the labor market, including vocational education teachers. [41] As the demands of the new labor market move toward a workforce with demonstrable skills, we can expect K-12 education will be impacted. [42]

Actions:

- Identify potential for automation tools that can support individual student needs, such as personalized learning and assessment, within existing tools like the learning management system (LMS).

- Prioritize analytics and credentialing solutions that help build, quantify, record and demonstrate individual student learning.

- Measure the appetite for gamified learning at your institution by establishing partnerships with gaming vendors to run controlled pilots. Identify the appropriate metrics in advance, such as alignment to curriculum requirements, expected learning outcomes and logistical costs, to help determine whether this undertaking is a success.

Further Reading:

Innovation Insight: K-12 Education Analytics

Quick Answer: How Can K-12 Education Get Ready for Conversational AI User Interfaces?

K-12 Education Innovation Snapshot

Learning Insights — Gapalytics and Recognition

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Analysis by Marlena Brown and Saher Mahmood

Description:

Learning insights in K-12 education signify the purposeful shift toward capturing tailored learning outcomes and consisting of two primary components:

- "Gapalytics" focuses on pinpointing learning gaps to allow for early identification and intervention. The impetus is on the learning loss experienced by students worldwide as a result of the pandemic and emerging readiness pressures to ensure students are college- or workforce-ready.

- Recognition refers to creating and capturing academic as well as vocational or skills-based learning with the use of digital credentials, such as badges and certificates, as part of the K-12 journey. This will help students to build a portfolio that enables them to grow. The seamless integration of gapalytics and recognition into education focuses on personalized, effective and outcomes-based learning that is captured and transferable to ensure students are postsecondary or workforce-ready.

Why Trending:

Among teachers, parents and nonstudents, 93% express dissatisfaction with high schools' preparation for college or the workforce. [43] Compounding this is the daunting projection of the expected decade-long effort to restore the prepandemic attainment gap. [44] These challenges intensify the imperative for K-12 institutions to proactively address learning gaps through insights and bolster students' readiness. CIOs bear a pivotal role in this transformative endeavor to:

- Implement advanced analytics

- Optimize technological infrastructure

- Facilitate personalized learning solutions

- Build recognition opportunities

Learning insights and recognition capabilities underlie the ability to successfully deliver information and to develop and measure the effectiveness of efforts to close learning gaps and prepare students for postsecondary endeavors. The priority institutions are placing on this is reflected in an increase of over 500% in K-12 CIO inquiries regarding data and analytics strategy and solutions. [45]

Implications:

- Increased pressure to utilize advanced data analytics tools to identify and address learning gaps.

- Ability to provide seamless integration of data from multiple internal transactional systems and external systems in order to provide a comprehensive student view.

- As more AI-based solutions flood the market, institution leaders should discern between industry-neutral platforms and focused point solutions to effectively pinpoint learning gaps and foster postsecondary readiness.

- Provide the ability to collect and share learning credentials and badges that will allow students to support multiple post-K-12 options.

Actions:

- Systematically assess analytics offerings, ensuring alignment with specific institutional needs for seamless data collection, cohesive institutionwide efforts and enhanced postsecondary readiness.

- Create a strong data integration strategy that focuses on promoting streamlined data collection, efficient technology use, ability to ingest structured and unstructured data, and is flexible.

- Prioritize technology solutions based on identified use cases supporting institutional outcomes, focusing on postsecondary readiness. This involves aligning current needs, ensuring flexibility to adapt to evolving requirements, and seizing existing opportunities to comprehensively address learning gaps.

- Offer technology solutions for credentialing within the learning management system (LMS) or independent solutions that can help students build a portfolio of certificates and badges which will strengthen their post-K-12 options.

Further Reading:

Predicts 2023: Education Will See Consolidation, Competition and Creativity

Innovation Insight: K-12 Education Analytics

Portable Digital Identity: Definition and Approaches

Evidence

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Secure School Environment	Strengthen School Operations	Support Student Progression
Safety and Well-being of Students and Staff	Workforce Challenge — Teacher Availability and Appropriateness	Demonstrable Learning
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Source: Gartner