Top 5 Trends Impacting K-12 Education in 2021

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Initiatives: Education Digital Transformation and Innovation

K-12 education continues to face challenges resulting from the pandemic. In 2021, education CIOs can embrace opportunities emerging from our top trends involving collaborating with senior leaders, leveraging hybrid work and learning environments, and adopting intelligence-based adaptive learning.

Overview

Opportunities

CIOs in K-12 education will continue to face challenges into 2021 resulting from the pandemic. Identifying and understanding K-12's top five trends will become critical for the education CIO dealing with an increasingly fluid and hybrid environment, regardless of what happens with the pandemic in 2021. For example, K-12 education CIOs can:

- Leverage digital to a larger degree than ever in this hybrid world to address the anticipated worldwide shortage of teachers, as well as provide needed remote and hybrid flexibility for staffing and teaching.
- Collaborate with organizational leaders to develop a more robust strategy for schools' migration to the cloud to add future flexibility and scalability.
- Rely heavily on the use of digital assessments and analytics, both in-person and remote, leveraging formative and more innovative ways to gain rapid feedback and insight on student learning.
- Adopt a greater use of intelligence-based adaptive learning by addressing significant learning loss incurred by students in 2020.

Recommendations

K-12 CIOs involved with education digital transformation and innovation should:

- Prepare for coming changes in 2021 by focusing on deliverables that specifically address requirements for a new model with increased delivery flexibility (in-person, remote and hybrid) and delivery of technology capabilities directly and specifically tied to improved student learning outcomes.

- Engage executive support and key decision makers in a common understanding of what needs to be addressed as schools eventually return to in-person learning, focusing especially on how to avoid drifting back to the prepandemic "status quo."

What You Need to Know

For the purposes of this research, the term "K-12 education" will be used to reference all primary/secondary education programs.

The global impact of the pandemic on education organizations around the world will continue to be felt through 2021 and beyond. Schools worldwide continue to struggle with having to open or close (sometimes repeatedly) as variants of the COVID-19 virus reignite around the world.

Each organization in every country did what they could to rise to the challenge and provide some kind of learning continuity for students in 2020. Those organizations that could do so created remote learning capabilities and accelerated the launch of a new hybrid learning age in K-12. Many countries that did not have those capabilities are currently exploring ways to build remote capacity while making significant technology investments to modernize infrastructure. [1] Even organizations in countries where schools have reopened have recognized the importance of having remote capabilities that can be turned on and off as needed to meet challenges, including weather disasters, snow days or even another medical crisis. [2]

Several business and strategic technology trends in K-12 evolved from these unusual conditions, the top five of which are highlighted in this research. Each had importance "pre-COVID," but postpandemic, each trend accelerated and took on an even more critical role. The importance of the K-12 CIO role has never been greater, as the CIO must be able to tie the organization's mission-critical priorities to the necessary technology capabilities and investments.

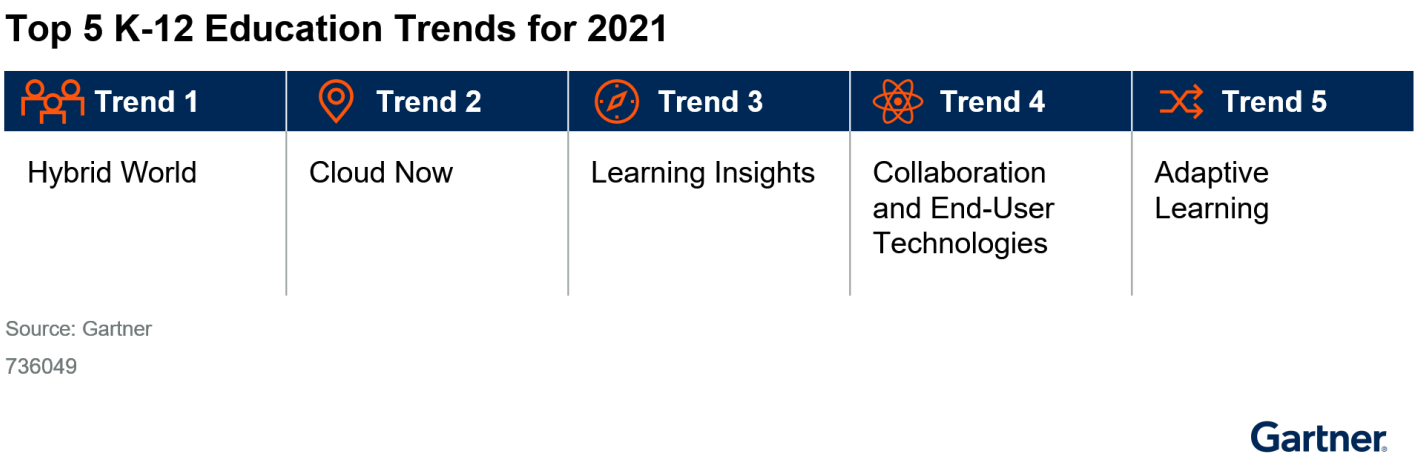
The reader may notice that, with one exception, these trends do not repeat any of the previous years' K-12 trends. This reflects the reality that the events of 2020 have pushed several trends and initiatives to the back burner, and brought new ones to the forefront.

The early efforts of K-12 remote learning by educators and administrative staff were, at times, ugly and messy, and, in some places, shook parents' confidence in its viability. However, the reality is that the monumental task of reaching students when schools around the world were closed represented an amazing accomplishment. Much of this effort was established in a matter of days and weeks. The creativity and force of will needed to find ways to do what needed to be done has made a huge difference in the lives of students. But there is so much more to do.

This hybrid age can best be described as a new demand for flexible instructional delivery, capable of adapting as needed to focus on the best of what in-person and online learning (particularly remote) can offer. This has created not only a monumental challenge across K-12 organizations, but also a massive opportunity to accelerate the organization's progress toward achieving its digital ambitions.

An adaptable, agile K-12 organization of the future will be one that recognizes the key strategic technologies and business trends represented by these top five trends shown in Figure 1.

Figure 1: Top 5 K-12 Education Trends 2021



Each represents both a response to the crises the pandemic created and, more importantly, trends in business and strategic technologies that will position the organization for the future.

Trend 1: Hybrid World

Analysis by: Kelly J. Calhoun Williams

Description:

This trend represents an evolved recognition postpandemic that K-12 needs a new way to adapt to more-flexible models for the delivery of instruction under almost any conditions. Though there is a great deal of pressure to return to the status quo of traditional education in many parts of the world, what educators have learned in the last year has made it impossible to do so. Organizations have seen the benefit of leveraging both in-person and remote learning options, mashing these two approaches together in unique ways to create a new, hybrid-centric model for a more-resilient and agile organization.

Why Trending:

Most of the world recognized the situation the pandemic created for education for what it was — both a disaster and an unprecedented accelerant for leaping education forward into the digital age. Significant investments in technologies and infrastructure have been made in many countries, and there is a great deal of interest in ensuring those investments do not evaporate once the worst of the pandemic is over. [3]

Hybrid world, one of our new trends, describes a situation in which there will be almost universal recognition of the importance of not only having a well-thought-out hybrid delivery strategy, but also an intentional focus on this as a well-defined capability. The organization must have a strategy to protect

students from disruptions to their education, and also address their learning preferences — a new hybrid culture, if you will.

This is trending, because a redesign is needed that gives access to flexible and adaptable digital learning resources and systems, and a focus on those that ensure student engagement and connection, even when remote.

The need for professional development for teachers to navigate this new world cannot be overstated, and explains why this is such a strong trend this year. Most organizations learned several lessons early on, including that:

- Remote teaching is not similar to teaching with technology in the classroom, with a very different pedagogy required. [4]
- The type of hybrid model used can create inordinate amounts of extra work required for teachers, with some complaining that they feel their job has doubled in workload.
- Teachers need help to learn how to be effective in a digital environment in general, and in a remote one in particular. Having expert modeling, ongoing professional development and a significantly expanded professional learning community are also positively associated with helping teachers expand their abilities. [5]

Implications:

With the advent of the pandemic, all K-12 education CIOs are tasked with leveraging technology to its fullest to improve students' lives and learning. Though the challenges to date have been enormous, the potential to shift education in a whole new direction is unmistakable. The movement to more 1:1 (computer-to-student) ratios will continue. With that, there is a growing expectation that everything will be digitally enabled and that little to nothing will disrupt a student's education. Hybrid has revealed an entire student population that has actually thrived in a remote environment, and increasingly, K-12 organizations are being asked not only to continue hybrid offerings, but also to keep offering remote options. This expectation will put a major demand on educational leaders to creatively think of new ways to meet these needs, even in difficult budget times.

Hybrid as a model is here to stay, and CIOs must prepare for that future.

Actions:

- K-12 education CIOs should:
  - Expand beyond the basics of creating learning management systems (LMSs) or video web conferencing connections between teachers and students by identifying other digital capabilities to improve instruction.

- Enable faculty and students to leverage new skills in 2020 by preparing innovative new in-person digital learning environments for when they return to campus. Start planning that now with organization stakeholders.
- Prepare for increased demand for all digital services by auditing your current infrastructure and cybersecurity status. Prepare early for that surge in demands that this larger “digitalized schools” footprint will create.

Trend 2: Cloud Now

Analysis by: Kelly J. Calhoun Williams

Description:

“Cloud now” refers to the trend driving a major push away from legacy and locally hosted systems and services toward cloud-based ones. This trend has been evolving for several years, as K-12 organizations have increased their trust in cloud providers and their ability to securely and safely deliver and manage increasingly sensitive data. However, as with several other technologies, the advent of the pandemic accelerated the movement to the cloud at a breakneck pace. The trend of “cloud eventually” became “cloud now.”

Why Trending:

The COVID-19 event created several crises for K-12 education. Schools suddenly needed to close, and organizations desperately trying to create remote learning options suddenly learned (or relearned) several key benefits of the cloud. Not only did students need immediate access to learning resources and systems, but also the entire workforce of the organization — business, administrative and instructional — was typically forced to work remotely overnight. Network designs moved from what was for many a fairly simplistic, “everything is inside our walls” schema to the complex question of how to secure resources when everyone is *outside* the walls.

The sudden need for options for secure remote access spawned a list of problems that cloud could help solve. Organizations realized they needed flexibility and rapid scalability of their infrastructure resources in ways they hadn’t before. Virtual labs, virtual desktops (virtual desktop infrastructure [VDI] or desktop as a service [DaaS]), automation and remote network access needs for staff, and the ability to deliver it all in a variable demand environment has drawn K-12 CIOs into exploring these technologies. Whether private, public or hybrid clouds; multiclouds; or other designs, each strategy lends itself to capabilities to serve needs the agency could not meet before, and address peaks and valleys in usage more cost-effectively. Education is now focused on how to deliver services no matter the user’s location, what kind of device he or she has available, or what type of connection. The advantage of cloud is that it makes each of these possible.

Implications:

Those that were experimenting with various aspects of cloud use over the last several years and encouraged expanding investments in this area had those theories tested with the flood of new demands the pandemic has generated. Though they may have had migration plans mapped across several years, they made these moves in weeks or months. Organizations raced to migrate key systems and operations to the cloud as they raced to orient IT staff on new required skills and designs.

Those that made these preparations, however, have reaped the benefits of the increased agility and adaptability of cloud services. Although they may not appear to save money on the front end of the equation, these major shifts from traditional, locally hosted services to software-as-a-service models have revealed how they can free up resources for other things internally. Increasingly, K-12 CIOs have come to recognize that there are many trusted cloud vendors that can do several things "better, cheaper and faster" (and typically, far more securely) than the organization can do for itself.

Actions:

- K-12 education CIOs should:
  - Consider where cloud-based services could benefit the organization by examining all systems where scalability, security or agility is currently a struggle, and verify cloud-based alternatives.
  - Transition from capital expenditures to operational ones as an ongoing requirement by educating the executive team (especially the financial leadership) on why these changes will ultimately be required to meet this new challenge of acquiring services.
  - Strengthen cost management strategies by adopting processes that improve the business case and value/benefit realization process, up-valuing soft benefits such as flexibility.

Trend 3: Learning Insights

Analysis by: Kelly J. Calhoun Williams

Description:

"Learning insights" is a broad umbrella term intended to describe a collection of technologies specifically focused on faster, more-accurate and more-actionable insight into a student's learning. These technologies include (and in some cases, were represented in the 2020 top five trends) digital assessments, analytics and learning management systems (see Top 5 Trends Impacting K-12 Education in 2020).

Why Trending:

The pandemic's impact has driven a wave of new demands for leveraging digital to improve learning insights and demands for tools that are available whether the student is in person or remote. The known learning losses for students during this time have created a major task for organizations that are seeking

to identify student learning gaps from last year and redesign curriculum and learning plans to fill those gaps.

This requires tools that are much more capable and useful than the traditional means of assessment education has long depended on, such as simple quizzes and tests. A combination of technologies and creative ways to combine them is needed to gain the insight faster and more specifically to target students' learning gaps as quickly as possible.

For example, adaptive learning systems (see Trend 5) can be leveraged to create assessments of a particular curriculum provider's content from 2020, target key prerequisite skills and recommend a personalized remediation plan for each student. Effective analytics tools can be used as well to continuously reassess and identify any students not ready to move forward into a curriculum for the next school year (an adapted one, as this won't be a full year either).

Education leadership is turning to these technologies to meet those challenges, which it would likely be unable to address well at scale otherwise.

Implications:

No organization is likely to be able to redo 2020 entirely, and even if they could, it would only set students even farther behind. The ability to quickly identify the "stepping stone" skills for students that will be needed to do a collapsed version of instructional plans over two school years will be required, but it will be very challenging.

Looking at the *combination* of technologies and capabilities they bring to the organization will be a necessary and important part of leveraging digital to help address a major problem. The K-12 CIO, along with key stakeholders across the organization, will need to share in some creative thinking to address the challenge. The CIO must have a greater grasp of these technologies' capabilities to help position the organization to leverage them.

As an added bonus, it can also build confidence in the organization that the technology division is capable of leveraging important digital investments to solve the organization's mission-critical problems at a time when they're needed most.

Actions:

- K-12 education CIOs should:
  - Assess the organization's current capabilities across the full spectrum of learning insights technologies by engaging partners from the teaching and learning/curriculum division, as well as key expertise within your department, to help define the need.
  - Gain the critical skills to support these needs and target this issue by hiring third-party expertise to help if needed. Your local higher education institutions might already have internal resources who can help their education research teams if funding for outside resources is an issue.

Trend 4: Collaboration and End-User Technologies

Analysis by: Kelly J. Calhoun Williams

Description:

Collaboration technologies can enable secure and reliable tools for communicating, working together and sharing resources as needed across an organization. End-user technologies are focused on creating secure, scalable user environments, regardless of where the user is located. Popular examples of these include VDI and DaaS, described below. Each of these is important for enabling the environments that have emerged in K-12 education, with thousands of rapidly deployed devices used in and outside the network. Creating and managing effective collaboration tools, generating desktops that can be built quickly and securely and used on most any kind of device, and wherever the end user may be, have suddenly become quite relevant in K-12.

Why Trending:

The advent of the pandemic brought the recognition that students, faculty and administrative staff would be sent home immediately to learn and work to the forefront. Some K-12 organizations had taken early steps to accommodate remote work (sometimes just for a few special users that needed after-hours or remote access to a particular system), but there were no large-scale systems for this situation. Many had built their network security models around requiring physical presence within the organization's confines to access data. Movement to cloud-based systems for key functions (such as email) often expanded the network's reach and addressed a feature end users appreciated, but much more was needed when suddenly everyone was forced to work or learn from home.

The crisis created a need to address two critical capabilities in ways most K-12 organizations had not before:

1. A more-sophisticated understanding and application of collaboration tools to connect teachers, students and staff via video, audio and document storage and management at a strategic level

2. The ability to create device desktops that could accommodate different user profiles; "deploy, destroy and redeploy" rapidly in quantity, with the ability to centrally manage applications and data; as well as secure the organization's resources, regardless of user location

After the initial rush of leveraging existing solutions, K-12 CIOs are now contemplating how to rethink their organization's existing product portfolio, and leverage these products for a longer-term, improved position for the future. These include how these functions can be integrated into existing common platforms (such as Microsoft, Google or Zoom), for productivity and connecting (such as Microsoft Teams or Google Meet), or even integrated into existing, cloud-based LMSs (which were also rapidly deployed in this time).

Implications:

We see a future where unexpected situations require some end users to work from home long term or permanently, as schools may need to be flexible about whether learning that day will be on-campus, remote or hybrid. The hybrid world now demands an organization be agile and well prepared with a strategy and planning for its collaboration and end-user technologies. This will require rethinking of policies, governance models, security practices and more.

This is also part of building a new (and potentially innovative) culture within the organization, which now has skills and abilities it did not have before the pandemic. Most organizations now expect that everyone will be able to work, teach and learn anytime, anywhere. Furthermore, all solutions designed for distance learning must work well, whether the user is working in a hybrid model or returns to campus full time.

Actions:

- K-12 education CIOs should:
  - Prepare for the return to school (if they're not there already) by reviewing these technologies for what will (or will not) need to change to work effectively and securely. Environments can rapidly change between in-person, remote and hybrid, even potentially mixing them all in one class.
  - Explore the options not currently in use for VDI or DaaS by leveraging Gartner inquiry, and determine whether opportunities or advantages have been overlooked in the rush to implement solutions.

Trend 5: Adaptive Learning

Analysis by: Kelly J. Calhoun Williams

Description:

Using technology as an interactive teaching tool, adaptive learning platforms and content deliver learning resources that are customized to meet the needs of an individual student. According to Gartner, adaptive learning dynamically adjusts the way instructional content is presented to students based on their responses or preferences. It is increasingly dependent on a large-scale collection of learning data and algorithmically (including artificial intelligence [AI])-derived pedagogical responses.

Dependent on the foundation in learning insights, adaptive learning uses continuous assessment and learning analytics, ideally allowing the alteration of sequence, pace and type of learning resource to meet a user's unique needs. The advances in the use of AI and related technologies will likely be the means to significantly advance and scale up adaptive learning in the future.

Why Trending:

Adaptive learning becomes an especially timely capability today, as organizations struggle to quickly identify individual learning gaps and help students catch up to where they need to be for the new year. Today, vendors provide products and platforms that achieve varying degrees of adaptivity through a variety of means, from the simple to the significantly complex. (See Top 5 Trends Impacting K-12 Education in 2020 and Prepare for AI's New Adaptive Learning Impacts on K-12 Education for additional detail.)

- Again, as with learning insights, K-12 organizations are being offered more options today for adaptive learning, thanks to the advent of AI enhancements in this area. However, due to the complexity of this endeavor, progress remains slow. [6]
- A significant amount of learning data is needed to power these adaptive platforms, which remains a sensitive and technically necessary aspect to adaptive learning that requires further advancing trust and security in the use of student data.
- LMSs and other instructional products now often include AI-enhanced adaptive learning tools, with more diverse subject matter than ever before.

Implications:

K-12 is seeing momentum on the adaptive learning front, as AI-based enhancements advance and add new capabilities and insights. The advent of these capabilities marks the significant progress of reaching this category's potential in K-12.

For all its progress, some of the learning theories and algorithms on which a number of these technologies are based are not necessarily highly sophisticated yet. However, this may change significantly as (1) AI-based technologies mature and improve (and personal comfort improves as trust builds), and (2) AI is constantly learning, and over time, its value increases if appropriately designed. This potentially brings a much greater level of sophistication to the personalized adaptation of curricula. Expect to see continuing progress in this arena in the next few years as technology improvements for commercial uses continue to deliver opportunities for education.

Actions:

- K-12 education CIOs should:
  - Anticipate the increased volume of learning data being collected (especially as AI-enhanced products arrive) by developing policies that address concerns around data privacy and security. Ensure that stakeholders are aware of the benefits and the purpose (as well as the ethics) of this additional data and build trust.
  - Identify any adaptive learning capabilities you may already have, such as options that integrate with your LMS. Expand on these by creating pilot projects on a small scale to explore the practical applications of this technology in your environment.

Evidence

[1] How Countries Are Using Edtech (Including Online Learning, Radio, Television, Texting) to Support Access to Remote Learning During the COVID-19 Pandemic, The World Bank.

[2] COVID-19 and Student Performance, Equity, and U.S. Education Policy, Economic Policy Institute.

[3] Post-Covid-19 Education and Education Technology 'Solutionism': A Seller's Market, Springer Link.

[4] Will Shift to Remote Teaching Be Boon or Bane for Online Learning? Inside Higher Ed.

[5] The Shift to Online Teaching, Usable Knowledge.

[6] Challenges and Contexts in Establishing Adaptive Learning in Higher Education: Findings From a Delphi Study, Springer Link.

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Recommended by the Author

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