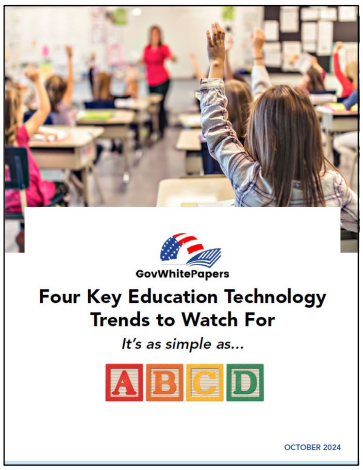

Four Key Education Technology Trends to Watch For

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Four Key Education Technology Trends to Watch For

It's as simple as...

OCTOBER 2024

Like in every sector of society, technology is having a huge impact on education, changing the way teachers teach, students learn, and researchers discover. We wanted to take a look at the role technology plays in education. From kindergarten through graduate school, teachers and administrators are integrating technology in new ways to meet the needs of students and the institutions that support them.

After speaking with leaders in education technology and reviewing the latest government regulations and guidance for technology in education, we identified four key trends for K-12 and higher education. While the categorization might be as simple as A, B, C, and D, the challenges facing educators and administrators are much more complex.

A is for Artificial Intelligence

Artificial intelligence (AI) is both a boon and a bane for educators. AI in K-12 classrooms holds the promise to automate many tasks, including lesson planning, grading and feedback, parent communication, and tutoring support. However, they also have to face the issue of students utilizing it as a shortcut for homework and assignments. Rather than resisting AI, educators are embracing it as a reality and leaning into ensuring that the technology is used accurately and ethically, both by their students and themselves. Charles Elliott, Field CTO, Education and Research for Google Public Sector, stated that AI should be treated as a learning tool because, when used responsibly, it can create a more Socratic experience than traditional ask-and-answer worksheets. AI as homework help can actually create a richer learning experience for many students.

The integration of AI into education can take lessons from other industries that have introduced automation. Doug Thompson, Director, Solutions Engineering & Chief Education Architect at Tanium, pointed out that automation in cars started with low-risk processes–turning on headlights at dusk and starting wipers in the rain–and has progressed since then. Similarly, educators should look to implement AI in ways that have a low-risk threshold and allow humans to "sign off" on the actions suggested by AI. While AI can generate personalized learning plans, predict student performance, and transcribe lectures, human intervention remains crucial for refining, monitoring, and applying these outputs in meaningful ways.

Responsible AI in Education

The responsible use of AI is shared between educators and technology vendors. The U.S. Department of Education Office of Educational Technology issued guidance[1] around the concept of shared responsibility. The guidance outlines risks that schools should examine and address before implementing AI:

- A "race to release"
- Bias and fairness
- Data privacy and security
- Harmful content
- Ineffective systems
- Malicious uses
- Misinformation management
- Transparency and explainability
- Underprepared users

The guidance also stressed the need to keep "humans in the loop" to check AI outputs and the impacts of AI-generated recommendations. Additionally, it encouraged institutions to utilize technologies that are designed specifically for the education market and:

- Provide evidence of rationale and impact
- Advance equality and protect civil rights
- Ensure safety and security
- Promote transparency to earn trust

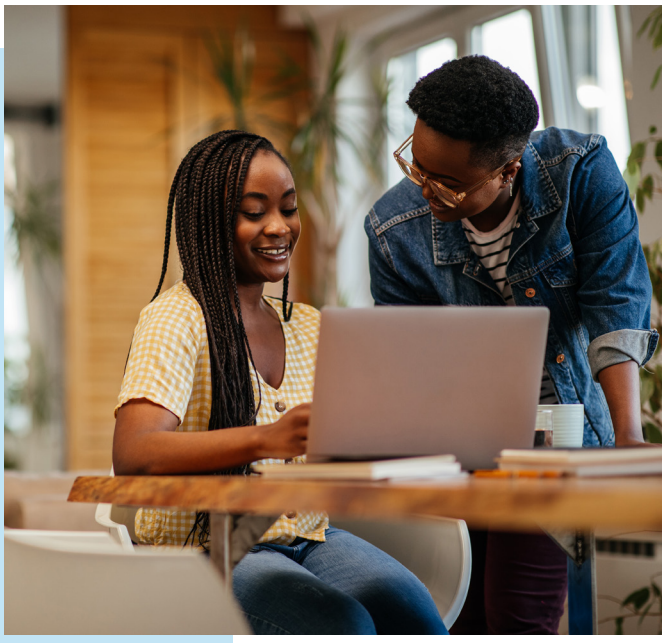
But, of course, the AI solution is only as good as the data it has to work with. Thompson noted that with bad data or a poor process, AI just helps you make mistakes faster. A focus on data quality and access is important for AI, as well as sustainable business practices.

B is for Better Business with Analytics

Academia is considered analytical and thoughtful, but when it comes to the modern definition of analytics—the computational analysis of data—the two are not as tightly aligned. Educational institutions are awash in data—information about students, their performance, program revenues, and so much more. However, that data is siloed and owned by different groups that do not always collaborate.

Higher education, in particular, is focused on business sustainability. Enrollment numbers are decreasing for various reasons, including population decline, affordability concerns, and the evolution of career options, and universities need to double down on their data to determine the cost and ROI of different programs and offerings.

Steve Harris, President and General Manager, Public Sector for Alteryx, detailed how much value there is in bridging the existing silos. The first step is reporting, being able to gather all of the data to show year-over-year performance (either of a student group or of parts of the university business). The next, more powerful step is applying analytics to that reported data to be able to ask questions about it and find out why things happened. As organizations become more analytically mature they can then model out changes. Rather than implementing a new policy or changing a business structure and then waiting a year to see the results, analytics can provide predictive insights into the impact of changes.



Higher education enrollment numbers are decreasing for various reasons, including:

- Population decline
- Affordability concerns
- Evolution of career options

Putting Analytics into Action

Harris cited the Joint Statement on Analytics[2] from the Association for Institutional Research (AIR), EDUCAUSE, and the National Association of College and University Business Officers (NACUBO) as a key to driving change in how universities, in particular, utilize data.

This overview of implementing analytics provides six principles:

1. Go big – Unlike with AI, there is no need to wade in slowly. Utilize analytics to address the most pressing issues first.
2. Invest what you can – By this, the group means invest everything you can–time, talent, and money–to get the solution right the first time.
3. Analytics is a team sport – Establish a team approach with an expectation for collaboration across colleges, departments, and divisions.
4. Analytics has a real impact on real people – Responsible use of data is a non-negotiable priority.

5. Prepare for detours – Expect mistakes and setbacks and make these acceptable. Staff need to see analytics as a long-term commitment, a core part of their day-to-day functions, and a driver for institutional decision-making.
6. Act now – Without analytics that improve the functioning of an organization, students will continue to leave institutions without graduating, discouraged, and more in debt than when they entered.

Applying the research rigor used in classrooms to the business data held within educational institutions is a necessary step for them to evolve and thrive. Of course, achieving access to and visibility into that data needs to be done securely, as detailed in the next education technology trend.

C is for Cybersecurity

With large amounts of highly sensitive personal data and limited IT budgets and staff, educational institutions are a particularly popular target for ransomware and other cyber attacks, and the risk continues to rise. There was a 105% increase[3] in ransomware attacks in the education sector from 2022 to 2023.

Thompson cited email as a complex security hole. Even with robust training and security measures, large user bases increase the likelihood of someone inadvertently clicking a malicious link. Plus, bad actors are using AI to scale and evolve email threats faster than IT teams can adapt. In addition to a continued focus on email safety practices, educational organizations should also focus on protecting the crown jewels of the organization – data.

105%

Percent increase in ransomware attacks in the education sector from 2022 to 2023.

Centralizing IT

Historically, especially at the higher education level, organizations have designed their own IT systems to meet their specific needs. For example, a business school at a university may have a bigger budget and more technology experts than a smaller school. The team at the business school has likely procured, designed, and deployed a wide variety of solutions not available to others across the university. Not only does this result in inequity, but it's also incredibly inefficient and can pose new security vulnerabilities.

To improve cybersecurity in higher education, Thompson sees many schools looking to centralize their IT to get a better handle on all of the systems in use and create strategies to protect the data those systems access. This is, of course, easier said than done and requires a lot of give-and-take with users having to accept new systems. But the effort is worth it as it allows for efficiencies of scale in terms of licenses, storage, and computing power, not to mention the needed visibility for increased security.

With a handle on the IT systems in use, IT teams can then focus on the data and put guardrails in place to protect it accordingly. Personal, sensitive data should be open to a select few, and those people should have to submit to multifactor methods to get access. Even then, that access should be limited in terms of a time limit (only allowing someone to be in a file for, say, one hour) or where the data can be moved.

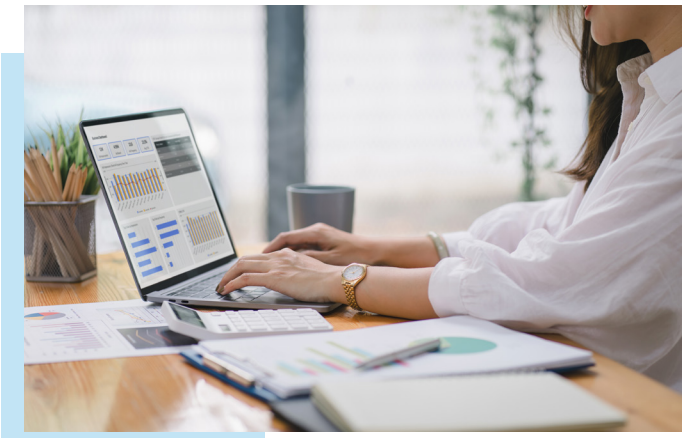
D is for Data Literacy

Underpinning all of these technology applications is the need for increased data literacy, first for our educators and then passed on to students. Data literacy can be defined as "the ability to read, work with, analyze, and argue with data." With this broad definition in mind, it opens the door for the discussion of data beyond just data scientists and analysts. In fact, data literacy is more akin to financial literacy—a life skill that everyone should have, not just bankers.

Removing the stigma that data science is only for trained professionals is important in making society, as a whole, data literate. According to Harris, technology that utilizes data has to be easy to engage with so that people can begin to work with data in new ways. The hands-on work with data sets the path for improved data literacy. Thompson echoed that if you only give AI to people who understand data, you lose a huge opportunity. Making it available more broadly with education around responsible use allows human creativity to deliver new ways to use data and AI solutions for K-12 and higher education.

Building the Data Literacy Curriculum

For educators, this means incorporating data literacy into lessons, pushing students to realize that if an answer does not turn up in a web search, it does not mean it does not exist. The problem may lie in how they asked the question. Researchers have found that even very small changes to how prompts are written[4] result in different outcomes, making it clear that the quality of prompts greatly affects the quality of outputs. Everyone needs training on how to most effectively craft questions to get the desired results out of AI and data platforms. Elliott shared that Google works with customers to provide best practices to help them write prompts that work specifically for the models that an organization is using.



The National Association of State Chief Information Officers (NASCIO) found that[5] agencies that prioritize data literacy training have staff that are:

- less likely[6] to click on malicious email links that introduce malware into networks;
- able to evaluate the validity of survey data by checking the sample size, the date of the research, the funding source, and the logic of the baselines;
- able to understand the difference between correlation and causation;
- able to recognize biases.

The incorporation of data literacy discussions and practical applications needs to happen across all levels of education with both students and staff.

Technology Advances Take Us All Back to School

Adapting to the reality of AI in the classroom, meeting the changing dynamics of the business of education, and battling security threats requires that educators and students alike gain a new understanding and appreciation for technology and the data that powers it.

The challenge is to ensure technology enhances the learning process rather than becoming a shortcut. Taking a lesson from the development of GPS (Global Positioning System), educators must be strategic in their understanding and use of tech. GPS made it far quicker, easier, and more convenient to find our way around[7]. However, it has had an impact on our sense of physical geography, with a generation of people that have never had to rely on a map or general sense of direction to find a location. Looking at technology use in the classroom, it needs to become a tool that enhances how we teach and learn, offering more personalized learning and assessment for a wide variety of learners.

To stay up-to-date on the latest ed tech trends, check out GovEvents and GovWhitePapers to find events and resources where leaders share their successes and challenges.

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