:: IT Management

GAME CHANGER

RETHINKING HOW TECHNOLOGY IS USED IN EDUCATION

TECHNOLOGY IN EDUCATION

Supporting Digital Transformation in Higher Education

To sustain the technology innovations that blossomed during the pandemic, institutions must invest in IT infrastructure and develop an IT strategy centered on student success.

TECHNOLOGY WAS ALREADY TRANSFORMING teaching, learning and scholarship at colleges and universities before COVID emerged. The pandemic has accelerated these changes, spurring new models for instruction and campus operations that will continue long after COVID recedes.

According to global research firm McKinsey & Company, students and faculty are eager to continue using the new technologies adopted during the pandemic. Many of these changes have improved the student experience by making it easier for students to access course materials and participate in their education from wherever they are, thus enhancing student success.

However, sustaining these new practices and supporting further innovation will require the right blend of technologies and leadership practices within higher education institutions — including an IT infrastructure that allows for future growth and expansion.

PRODUCED BY: CAMPUS TECHNOLOGY

SPONSORED BY: LUMEN®

Interactive Learning Models Drive Technology Adoption

As COVID forced a shift to remote learning and working, colleges and universities turned to new technologies to support more seamless, interactive collaboration from a distance. The uptick in technology adoption has been significant: A McKinsey survey of students and faculty from public and private U.S. colleges and universities, for example, found a 19% average increase in the use of learning technologies overall since the pandemic began.

For some technologies, the growth in usage has been even more dramatic. Tools that support connectivity and community building — such as social media-inspired discussion platforms and virtual study groups — have seen the biggest jump in use (49%), according to McKinsey data. The use of group work tools, meanwhile, has grown by 29%.

The shift to more interactive and diverse learning models is likely to continue. As one industry expert told McKinsey, "The pandemic pushed the need for a new learning experience online. It re-centered institutions to think about how they'll teach moving forward and has brought synchronous and hybrid learning into focus."

Challenges to Innovation Persist

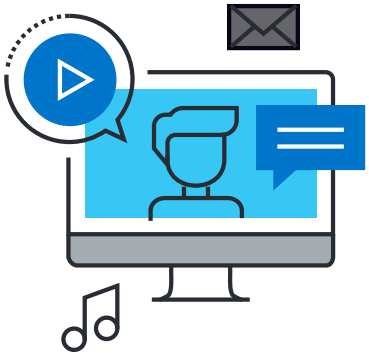
For many universities, the changes made during COVID have jumpstarted the broader institutional strategy for digital transformation. Prior to the pandemic, 55 percent of IT leaders said their institutions were either "not yet" or not at all engaged in digital transformation, **according to an Educause survey**. In 2021, this figure was only 29 percent.

Still, many challenges to innovation remain. An **annual list from Educause** highlighting the top 10 IT issues facing colleges and universities identified the following priorities, among others:

- *Developing the IT infrastructure, processes and workforce skills to secure data.*
- *Accelerating digital transformation to improve operational efficiency.*
- *Using digitization to create more equitable, student-centric services.*
- *Creating a blended campus with both digital and physical spaces for learning and working.*
- *Creating a cloud and SaaS strategy that reduces costs and maintains control.*

To achieve these goals, colleges and universities will need a robust IT infrastructure that can support these innovations. "How do we get there?" **Educause wrote**. "By beginning with a shared vision and strategy to achieve a sustainable business model that places students' success at the center of it all."

Tools that support connectivity and community building — such as social media-inspired discussion platforms and virtual study groups — have seen the biggest jump in use (49%), according to McKinsey data. The use of group work tools, meanwhile, has grown by 29%.



SECURITY STRATEGIES

5 Elements of a Future-Ready IT Infrastructure

In any digital transformation effort, it's important to have a solid technology foundation in place. Here's where to start.

NONE OF THE INNOVATION THAT CAMPUS LEADERS ARE working toward is possible without an underlying IT foundation that enables success. Here are five key elements of a future-ready IT infrastructure that can effectively support digital transformation in higher education.

1 | A flexible, scalable WAN

Your network is the backbone that connects students, faculty and staff with digital tools and services, which is why successful digital transformation begins (and ends) with the network.

Colleges and universities need a strong but flexible wide-area network (WAN) that can easily scale to support future growth and innovation. A software-defined WAN (SD-WAN) meets this need by virtualizing the network architecture, allowing for centralized control and dynamically routing traffic in response to real-time capacity.

2 | Secure and agile cloud platforms

As more services and applications move from campus-based servers to the cloud, colleges and universities

need agile cloud platforms that can keep data secure and are responsive to their needs. "Effective deployment of cloud services is critical," noted Sonia Ramsey, regional vice president of State/Local Government and Education sales for Lumen. "It's foundational to enhanced innovation and efficiency."

Increasingly, institutions must balance their use of commercial cloud services with their own private cloud infrastructure. "When you upload data to private cloud services and you go to pull it out, you get charged for that," explained Scott Pohlman, director of higher education business development for Lumen. "That ends up creating a lot of budget issues. Having a robust infrastructure on campus where you can monitor cloud usage, funnel all users through a single platform and still give them the flexibility to connect to different cloud providers as they need to is important."

3 | Robust data security protocols and services

According to one survey, ransomware hit nearly two-thirds of higher education institutions worldwide in 2021.

"You have to be able to safeguard data and privacy," Ramsey emphasized. In the shift toward cloud computing and hybrid learning environments, "the security perimeter has changed. Before, everything was safe behind a firewall, now the perimeter needs to be extended to every user. This highlights the need for identity and access management. Who are your users, what can they access and when can they access it? Managing access by users, enabling validation and authentication tools, with secure connections can help protect sensitive data."

4 | Scalable and sustainable data storage

Driven by the growing use of big data applications and large research datasets in higher education, colleges and universities need an ever-increasing amount of data storage.

"Higher education institutions need a comprehensive, cost-effective data storage strategy," Ramsey observed. "The volume of data being collected from all areas of the campus is enormous. Transmitting all that data to the cloud becomes a very expensive proposition. This is where edge computing solutions must come into play."

5 | Tools for anytime, anywhere collaboration

"A robust unified communications strategy allows students, faculty and administration to connect and collaborate from anywhere, at any time, regardless of location," Ramsey said. "That's critical in this era of the hybrid campus."

Driven by the growing use of big data applications and large research datasets in higher education, colleges and universities need an ever-increasing amount of data storage.

DEFINING OBJECTIVES

3 Steps to Leading Digital Transformation

IT leaders play a critical role in digital transformation efforts. We've identified three key ways to steer strategic planning and resources and enable institutional innovation.

EFFECTIVE LEADERSHIP IS AN ESSENTIAL INGREDIENT FOR DIGITAL transformation to succeed. College presidents, provosts and other leaders must work with all stakeholder groups to establish a vision, convince people to buy in and empower staff to implement the desired changes.

Here are three critical steps in the journey toward transformation.

1 | Engage all departments in planning.

According to an **Educause survey**, the biggest barrier to digital transformation within higher education is poor planning and coordination across institutions, cited by 52% of respondents. Engaging stakeholders from *all* campus departments in planning and executing digital transformation is vital for success.

"This really needs to be a collective conversation involving all disciplines," said Lumen's Sonia Ramsey, "including leadership, IT, admissions and faculty."

2 | Define needs.

Planning should revolve around the academic needs of students and faculty. What services and technologies do they require to be successful? What underlying infrastructure is necessary to support these innovations?

"The ability of colleges and universities to thrive depends on their ability to put student success at the center of their digital transformation initiatives," Ramsey said.

3 | Consider budget restrictions.

Budgets are another key hurdle to overcome, with 41% of IT leaders **citing cost** as a "major" barrier to innovation. While meaningful digital transformation can't be achieved by a large enough budget alone, "it will demand at least some level of investment in institutional staff, money and technology resources," Educause observed.

Campus leaders will have to figure out their budget restrictions, Ramsey said. If these are prohibitive, "they'll need to be solved for."

Key Issues to Address

Equity of access

Digital equity is more critical than ever. As the student experience is no longer confined to the campus, students need reliable, high-speed internet service wherever they are. Colleges and universities should collaborate with regional education network organizations and service providers to address both "middle mile" and "last mile" connectivity in the areas they serve.

Implications of a "borderless" campus

Geography no longer dictates job opportunities. This could put rural institutions at a disadvantage when hiring staff. Institutions will need to plan for how they will attract and retain top-notch talent, particularly in the IT and cybersecurity fields.

The role of AI

As it becomes more challenging to hire personnel, can artificial intelligence be used to automate routine tasks that have been done manually before? If so, how will you secure buy-in from staff? "AI is one of those technologies that brings visceral reactions from both sides," Ramsey noted.

GAME CHANGER

RETHINKING HOW TECHNOLOGY IS USED IN EDUCATION

CUSTOMIZABLE NETWORKING

How Lumen Can Help

Lumen solutions assist colleges and universities by providing them the modern IT infrastructure they need to power digital transformation.

AS THE MAIN PROVIDER OF FIBER CONNECTIVITY FOR Internet2, the research backbone of the United States, Lumen has been serving higher education institutions for many decades. But Lumen is much more than just an infrastructure company.

"We're purpose-built for the Fourth Industrial Revolution," said Lumen's Sonia Ramsey. "The Lumen platform enables colleges and universities to acquire, analyze and act upon data quickly; embrace emerging technologies that will reshape operations; and efficiently deliver innovations that will redefine the learning experience."

Here are four ways Lumen puts modernization in motion at colleges and universities.

Adaptive Networking

Lumen's flexible, on-demand networking solutions deliver scalable, high-performance connectivity for critical data and applications.

"We have over 500,000 route miles of fiber," Ramsey said. Lumen offers software-defined networking over its fiber backbone, as well as public and private cloud connectivity, VPN and Ethernet services, managed network services and more.

Through its commitment to higher education, Lumen has partnered with regional education networks to provide fiber for high-speed connections to higher-education institutions across the country. "Our fiber supports approximately 70 percent of these networks nationwide," Ramsey noted.

Connected Security

Lumen maintains its own in-house threat intelligence team that leverages data scientists, machine learning technology and behavioral analytics.

"Our mission is to leverage our global network to help protect customers and keep the internet clean," Ramsey said. "We do this by sharing our threat intel with the global security community, notifying victims and proactively mitigating known cyber threats."

This benefits colleges and universities in two ways. Institutions that use Lumen connectivity solutions benefit from this added layer of security at no extra charge. In addition, schools can subscribe to get threat notifications and alerts in real time as they occur.

Unified Communications

Lumen offers integrated voice, video and web solutions designed to enhance communication and collaboration within and between institutions, powering remote learning and working.

"A differentiator for Lumen is the strength of our global network," noted Lumen's Scott Pohlman. "Lumen has one of the largest, most connected, deeply peered networks in the world. That connectivity is key not just for security but for quality of service.

By keeping calls on our IP backbone from the origination of the call to very close to its termination, we're in control of the user experience for a longer period of time. We can help ensure there is a high-quality path, and that the user gets a robust experience." That's made possible as Lumen has the worlds most deeply peered, highly distributed and reliable IP network.

Lumen's UC offerings take this best-of-breed voice solution and add customizable video and web conferencing solutions on top, such as Teams, WebEx or Zoom. The result is a modern voice and video service for maximum productivity.

Edge Computing

Colleges and universities can deploy Lumen edge computing solutions to store, analyze and work with massive research datasets closer to where students and teachers need them — minimizing network latency and providing fast, secure access to sensitive information.

With edge solutions from Lumen, institutions can store research datasets outside the network perimeter, where they won't interfere with regular network traffic, while also maintaining control of the data and keeping it close for rapid access.

"The cost load of moving data to/from a public cloud service provider would be too prohibitive," Pohlman explained. "We are creating purpose-built, bespoke edge platforms for our customers that simplify the edge by making it smaller, faster and much more flexible." ■

Learn More

Lumen's enterprise platform combines networking, edge cloud, collaboration, and security to power amazing experiences for higher education. Find out how to build a strong technology foundation for your campus at **lumen.com/highered**.