Higher education institutions around the world are building smart campuses using technology to ensure digital and institutional resiliency, sustainability, operational efficiency, hybrid-first operations and learning, and public health and safety of students and staff on campus.

Reimagining the Future of Higher Education: Transforming Classrooms and Campuses

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Introduction

Higher education leaders are continuing to invest in transforming classrooms, facilities, and campuses to build resiliency capabilities in the face of ongoing pandemic and business disruptions. Looking ahead, as institutions prioritize technology investments for the future of higher education, education IT leaders are seeking to transform their institutions into smart campuses that are resilient, sustainable, operationally efficient, and physically and digitally secure. This transformation is in response not only to the pandemic but also to faculty, staff, and students who demand that institutions take seriously their concerns around social and environmental responsibility and expect their physical and digital campus experiences to be seamless, personalized, connected, flexible, and secure. Key questions for higher education in the digital transformation of its spaces include:

» What does it mean to be a campus today while ensuring a safe place for students, staff, and faculty? What campus experiences are high priorities for students, staff, and faculty?

» How are buildings being managed differently given new technologies and trends in online and hybrid-first learning and operations?

» What technologies and business practices must be adopted or changed to build a more resilient and sustainable campus?

» What will the future classroom look like in colleges and universities?

In managing a safe return to the classroom and campus, colleges and universities remain focused on the safety of faculty, staff, and students as well as sustainability, security, and the ability to quickly pivot between remote and in-person experiences as conditions change (see Figure 1). However, this is only part of the story; higher education facilities not only

AT A GLANCE

KEY STATS

According to IDC research:

» Nearly half of higher education respondents noted that the health and safety of students, faculty, and staff and environmental and social responsibility are their top concerns in 2022.

» By 2024, 40% of education institutions will have adopted a hybrid-first approach to operations and service delivery, driven by high demand for flexible learning options among students and lifelong learners.
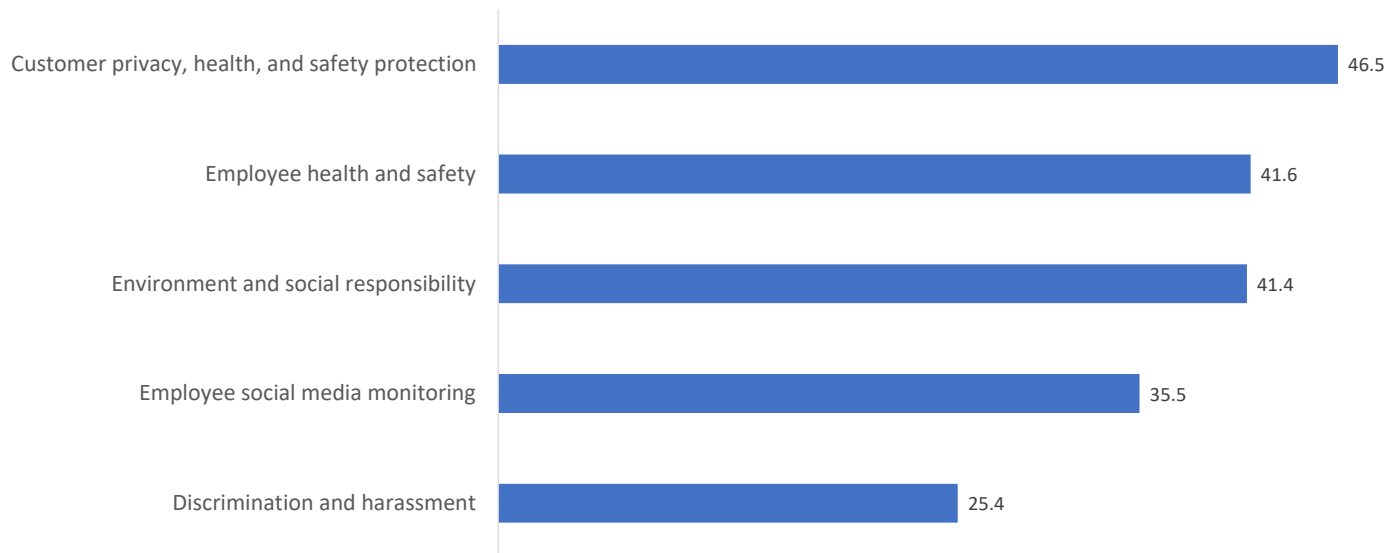
KEY TAKEAWAYS

As higher education continues to grapple with ongoing changes to campus life, institutions are seeking to advance smart campus initiatives to become resilient, sustainable, operationally efficient, and secure to address the next normal.

must support a fully hybrid campus experience but also must create smart campus experiences that entice various constituents (e.g., students, alumni, researchers, and corporate and nonprofit partners) to live, work, invest, and visit.

FIGURE 1: *Health and Safety of Faculty, Staff, and Students and Environmental and Social Responsibility Top the List of Concerns for Education Institutions*
  Q *Which of the following will your organization be most concerned with in 2022?*

Customer privacy, health, and safety protection	46.5
Employee health and safety	41.6
Environment and social responsibility	41.4
Employee social media monitoring	35.5
Discrimination and harassment	25.4

n = 48

Source: IDC's Future Enterprise Resiliency and Spending Survey, Wave 11, December 2021

Transforming classrooms and campuses is key for higher education institutions to address these top concerns in 2022. Smart campus technology will play an increasingly important role as institutions navigate ongoing change and disruption. The case for new investment is difficult in times of financial constraints, and it is critical to invest strategically to "future proof" institutions as much as possible.

Transforming Spaces Includes Smart Classrooms, Buildings, and Campuses

The transformation of higher education spaces is driven by the blending of the physical and digital worlds in all aspects of campus life and operations. In the classroom, technology now plays a critical role in teaching and learning. The rise of smart classrooms has enabled professors to utilize technology to enable frictionless engagements and encourage active participation of students with each other, the content, and the instructor, regardless of location. Smart classrooms empower faculty and are equipped with technology that amplifies collaboration opportunities between faculty and students, whether virtual or onsite, using broadband, personal devices, augmented reality/virtual reality (AR/VR) viewers, video cameras, headsets, and specialized content.

Technology has also proliferated in the back office, where the digitization and automation of workflows and business processes have enabled new innovations in service delivery and created new operational efficiencies that drive down operating costs. Additionally, higher education institutions are increasingly leveraging smart building and facilities

technology to support energy efficiency, cost savings, and sustainability goals, and they are implementing needed new services to ensure safety for the university community in physical and digital campus spaces.

Higher education campuses vary around the world; for example, in the United States and the United Kingdom, campuses may be physically separate locations for facilities and student housing, whereas in Canada or Germany, facilities and housing may be dispersed within the host community and less centralized. At its core, a smart campus embeds technology, such as Internet of Things (IoT) devices, ubiquitous connectivity, and analytics, for improved services, decision making, resilience, safety, and efficiency. These services range from location-based services that help people navigate facilities to mobile payments, wearables for health tracking, and building capacity and space planning. Pieced together, these emerging technologies are beginning to form the foundation of smart campuses as institutions seek to redefine and reimagine the higher education experience.

Hybrid Extends Beyond the Classroom to All Spaces

Pandemic impacts and market forces have shifted the expectations and needs of educators and learners today, and this impacts key business priorities for colleges and universities, from recruiting, yield, and retention to maintaining the ability to do grant-funded research. Digital-native students expect a personalized and connected learning experience, and data shows that the increased demand for hybrid and online learning will continue, which, in turn, will impact business models.

From rising demand from students for flexible learning models to an increase in flexible and hybrid work for faculty and staff, hybrid-first learning and operations are now key priorities of higher education leaders. IDC defines "hybrid-first" as an institutional approach that leverages a hybrid experience infrastructure to enable continuity of service regardless of physical location and to seamlessly shift between remote and in-person services. Hybrid first can be applied to back-office, classroom, student, or campus experiences. IDC believes that by 2024, 40% of education institutions will have adopted a hybrid-first approach to operations and service delivery, driven by high demand for flexible learning options among students and lifelong learners (source: *IDC FutureScape: Worldwide Education 2022 Predictions,* IDC #US47242621).

The COVID-19 pandemic has exposed the challenges that institutions face in offering remote or hybrid services, such as virtual mentoring, career coaching or staff skills training, and the lack of agility to respond quickly to a major crisis. This means that higher education institutions need to further modernize their spaces to improve connectedness, instrumentation, and edge intelligence to offer new services while building in security, resiliency, and sustainability. The digital and physical infrastructure and spaces that support faculty and students must be built/transformed so that institutions are structurally designed to be hybrid first.

Hybrid learning offerings expand the footprint and student base of a college or a university, but a true hybrid learning environment requires investments to upgrade or retrofit classrooms, redesign curriculums, improve cybersecurity, and provide secure, remote access tools. This is a broader shift than just using video for online classes and meetings. True remote and hybrid learning requires new videoconferencing equipment in classrooms and laboratories such as cameras, microphones, interactive whiteboards, and other specialized audio/visual equipment; digitally native content; scalable and flexible technologies to reach classes that may be in the hundreds or thousands; and the ability to use video and other tools for research and lab work, lectures and small group seminars, and mentoring/advising/career services, extracurriculars, and student health. Most importantly, these new technologies need to seamlessly work together so that faculty can focus on teaching and providing an engaging student experience whether in person or virtually.

The physical spaces on campuses also need to improve to meet student expectations and respond to a more contactless environment. Colleges and universities still need to ensure that there is value in an onsite presence for students while ensuring faculty, staff, students, and host communities feel safe with returning students. The campus experience will evolve by leveraging IoT to enable services from wayfinding to physical and mental health monitoring via mobile apps and devices to support students, as well as tools such as access cards, video, and intelligent devices to monitor and control buildings.

When we fully imagine the future of higher education, there is a blending of digital, virtual experiences and physical, in-person experiences. Student health services would offer health tracking via fitness trackers as well as check-ins via text and supported by telehealth appointments and in-person sessions, providing ongoing engagement as well as personalized attention. The same could apply to the career center, with mock interviews and mentoring offered via video sessions to practice interviews or edit resumes or opportunities for virtual interviews with companies around the globe that are supported by in-person interactions. These types of blended experiences apply to an almost unlimited number of services, such as clubs and social communities, classes, and crowdsourced help desk support.

Considering Cisco

Cisco has a strong presence in education, and its core networking and server technology has long been part of the technology stack found in education datacenters. Cisco's expanded portfolio of education-focused products and services enables educators, students, and administrative staff to connect from a school/school campus or from home.

Cisco has been working to support institutional transformation via solutions that scale across mobile devices, desktop computers, home and small offices, meeting rooms, classrooms, and cocreation spaces with a single collaboration cloud platform for video, calling, messaging and other services as well as integrations with learning management systems, other applications, and devices.

Collaboration and Distance Learning

Cisco Unified Communications and Collaboration is an IP-based communication system that integrates voice, video, data, and mobility products and applications for a secure communication and collaboration platform used by education institutions.

Webex by Cisco works to integrate virtual classes, meetings, and team collaboration with devices, including student devices and toll audio, for interactive and remote connection. Educators can use capabilities such as polling, meeting recording, or self-paced learning options that can be integrated with learning management systems. Webex has a variety of offerings, including:

- » **Webex by Cisco** enables educators and students to teach and learn in in-person, virtual, and hybrid environments, integrating meetings, messaging, and calling on a single integrated and trusted app. Staff and faculty can learn new Cisco offerings via online trainings and collaborate using cloud-based meetings and video. Webex by Cisco is designed to be user-friendly and is built for educational activities such as group work, in-class games, or classroom discussion.

- » **Webex Education Connector** is designed to integrate Webex with leading learning management systems. The Webex Education Connector enables classroom collaboration, facilitates distance learning, and simplifies administration.

» **Webex Devices** turn classrooms into hybrid learning environments where both at-home and in-person students can have the same experience. **Webex Boards** allow instructors to digitally whiteboard in the front of the classroom while broadcasting video and content to virtual students. **Room Kits** provide video and audio that can be added to any screen to enable classrooms with easy-to-manage video. A Room Kit includes cameras, speakers, and microphones and/or device integrations that let educators focus more on their content and less on technology.

» **Webex Control Hub** platform ensures that it's easy for IT to manage all devices, Webex accounts, and security from a single pane of glass.

» **Webex Calling** is an enterprise-grade cloud calling and team collaboration solution offered through a flexible subscription model. With centralized administration, security, and reliability, Cisco keeps the Webex cloud always on and always up to date so schools and universities can focus on their academic and research imperatives.

» **Cisco Call Control** delivers the right experience to the right user endpoint. These on-premises and integrated solutions allow customers to choose the consumption model that best fits their needs and reduce maintenance costs with infrastructure for voice, video, and messaging.

Secure Remote Access

Cisco understands the vulnerabilities of educators and administrators who are working from home and often access sensitive information. This is especially important as recent events have shown that remote devices have been used by bad actors for ransomware attacks and other hacking attempts. Cisco provides secure remote access via **Cisco Secure Remote Worker**, which offers an integrated set of solutions that provides secure access from any connection. **Cisco Umbrella** uses the internet's infrastructure to enforce security and block malicious activity before a connection is ever established. **Cisco Duo** uses multifactor authentication to verify user identity, and the device must satisfy security requirements before the user is granted access to IT systems and sensitive student, faculty, and administrative information. **Cisco AnyConnect** enables integrated virtual private network (VPN) access from any device, at any time and in any place, to provide secure access to critical IT resources.

Smart Connected Buildings and Campuses

Cisco has been developing smart hybrid campuses with a focus on resiliency, agility, and security.

» **Cisco Digital Network Architecture (DNA) Spaces:** With Cisco DNA Spaces, every piece of campus infrastructure is programmable, and location analytics is used for insight into the movement and behavior of people and things within physical spaces. Key features of DNA Spaces include:

- Autoregulate classroom temperatures, lighting, and occupancy

- Automatically apply policy throughout the campus

- Track attendance and in-person participation in the classroom and throughout buildings and campus, for outdoor and indoor spaces

- Automatically segment and secure user devices

- Improve network reliability and performance

- Simplify oversight with one management system

» **Cisco Customer Experience:** Cisco Collaboration for Virtual Education supports colleges and universities to rapidly enable a virtual educational experience with help from the Cisco Customer Experience team. This service offers training resources, from self-help to QuickStart Services, to help students, staff, and faculty quickly learn how to use virtual education services while reducing help desk calls. Services also include implementation support for IT staff, which can help accelerate deployment of new offerings.

Financing Options

Cisco has recognized the strain education institutions are under in the current environment. Cisco offers tools and solutions to help organizations afford purchasing technology upgrades or new technologies. **Cisco Capital** is designed to provide education institutions with flexible financing solutions for purchasing the latest technologies with no up-front costs and predictable payments. **Cisco Refresh** offers RF Certified Remanufactured Equipment that education IT managers can use to enable new service capabilities while making the most of their limited and often uncertain budgets. **Country Digital Acceleration** is a Cisco program built to expand access with country-level academic and industry partnerships and strategic investments. Currently, Cisco Country Digital Acceleration is involved with 37 countries around the world.

Market Opportunities and Challenges

Higher education institutions around the world are building smart campuses using technology to ensure digital and institutional resiliency, sustainability, operational efficiency, hybrid-first operations and learning, and public health and safety of students and staff on campus. This is challenged by constrained —or, in some cases, precarious — financial situations and the need to balance competing priorities while adapting business models and services to support a modern workforce and student base. This means that decision makers will be forced to carefully consider how to shift or change investment priorities. Cisco possesses the broad portfolio of technologies to support these transformational priorities plus funding support to help institutions make these transformations a reality.

Higher education is an increasingly competitive environment as many entrants are expanding their solution portfolios in terms of breadth and depth of product capabilities, professional services, cloud computing options, and IoT services as well as vying for limited dollars. There is significant jockeying for market share around collaborative applications and video tools, both of which are essential for administrators, teachers, and learners experiencing hybrid-first learning and work. Higher education buyers are being inundated with competitive offerings as they look for turnkey collaboration and communications solutions to simplify remote operations as well as long-term strategic partners that will support the overarching digital transformation strategies of their institutions.

Key Takeaways

As higher education institutions grapple with ongoing disruptions to business operations and campus life, projects and priorities will shift to build smart campuses that are digitally resilient, flexible, sustainable, efficient, and secure. Transforming classrooms and campuses is essential to the ability of institutions to respond to the demands of faculty and students for flexibility, choice, and autonomy and to evolve business and operating models to drive down costs, increase profit margins, and remain solvent in an uncertain world.

In response to COVID-19, higher education institutions have undergone significant transformation, and the focus for the future will be on continuing modernization efforts to meet the needs of students and lifelong learners. Institutions are now challenged to address pandemic-era technical debt and simplify their technology stack by prioritizing the digital tools they need to operate in this new environment. This will rest on a safe return to campus and ongoing sustainability efforts with the ability to enable hybrid-first experiences in all aspects of institutional operations and services. In addition, institutions need to be better prepared for any future disruptions so that they continue to address the needs of their diverse constituents.

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About the Analyst

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Matthew Leger is Research Manager for IDC Government Insights responsible for the Worldwide Education Digital Transformation Strategies practice. Mr. Leger's research focuses on key IT and digital transformation trends as well as emerging solutions impacting how primary, secondary, and higher education and related services are delivered.

MESSAGE FROM THE SPONSOR

Between reacting to change and reimagining education, there's a bridge

Ever since two professors started Cisco in 1984, education has been in our blood. Cisco partners with education institutions to support educators, administrators, researchers, and students inside and outside the classroom with collaboration, security, mobility, networking, and data center technologies. We work with tens of thousands of schools, colleges, and universities around the world, and have trained 12.6M students through the Cisco Networking Academy.

As the world changes and continues to change, we're here to help. Cisco is and will continue to be an education company and your trusted technology partner supporting education, and we believe it is critical to continue educating the leaders, dreamers, scientists, artists, researchers, caretakers, and doctors of tomorrow, without compromising trust, security, or privacy today. ***Learn more***.

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