

What's Next in Higher Education

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Where the Tech Troubles Are

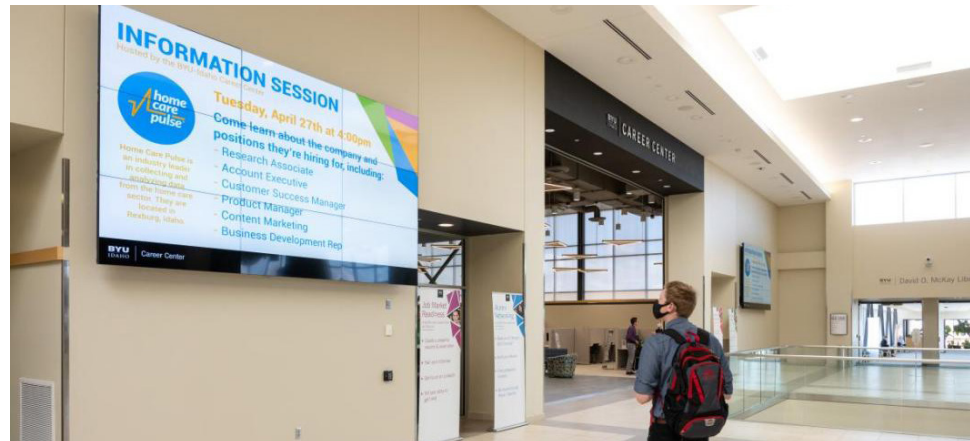
Students value connectivity, convenience and being consulted about technology but have little concern about protecting institutional networks.

Nancy Mann Jackson · November 1, 2022

Student interest will continue to grow when it comes to virtual courses and remote learning options for live courses, the desire for creating richer academic and on-campus experiences, and new technology options. Yet, on many campuses, technology dollars are limited, with a wide variety of initiatives competing for that funding.

Even at higher ed institutions that value student input in making allocation decisions, student desires must be weighed against other priorities, such as cybersecurity. “Campus IT dollars are stretched more than ever before at our institution,” says Bill Balint, chief information officer at Indiana University of Pennsylvania. “We have to figure out what initiatives are truly important to student success—and remember that a lack of proper investment in cybersecurity carries the most risk, even if students don’t perceive it. Cyberbreaches shut down campuses.”

More than one-third of college undergrads believe students should have a significant amount of input on the tech investments their institutions make, and an additional half think they should have some input, according to a [Student Voice survey](#) conducted Sept. 19 to 27 by *Inside Higher Ed* and College Pulse with support from



Nearly two-thirds of students surveyed find the content on digital signage to be useful. BYU Idaho’s two video walls outside its career center allow passersby to see key messages and announcements. The campus has more than 50 information screens. (BYU Idaho University Relations)

Kaplan. On the cybersecurity front, only 6 percent of the 2,000 respondents are very worried about their college being targeted by a cybersecurity breach or attack.

Meanwhile, findings from *Inside Higher Ed’s* Survey of Campus Chief Technology/Information Officers, which garnered 175 responses in August and September, shows how much more concern these higher ed professionals have about network protection. Fewer than one-quarter of campus CIOs in the survey, a collaboration

with Hanover Research, are very or extremely confident that their institution’s cybersecurity practices can prevent ransomware attacks. Nine in 10 say their institution has purchased cyberinsurance.

Campus technology investment decisions can represent delicate balancing acts between security, student preference and the institution’s future plans.

The Student Voice survey, which captured opinions of and experiences with both enterprise and

academic technology, revealed varying opinions about what campus technologies are most valuable. The right tech investments likely depend on the needs of each campus and its students regarding teaching and learning goals, cybersecurity, and student experience. Data highlights also include that:

- Wi-Fi is a big concern, with 62 percent of students saying they would like to see it improved and 43 percent saying it's just somewhat, not too or not at all reliable. The second top area in need of improvement, the online student portal, was chosen from a list of 21 possible areas by 37 percent of students. Nearly seven in 10 say their college's portal is somewhat (54 percent), not too or not at all user-friendly.
- Both online and in-person classes get interrupted at least sometimes by technology not working correctly. One in 10 who have had online classes say interruptions happen often, compared to 6 percent of those who have had in-person classes. Just 6 percent of those with online class experience say tech interruptions never happen, and 10 percent of those say the same about in-person classes.
- More than four in 10 students think it's OK for professors to limit (34 percent) or ban (8 percent) the use of tech devices in the classroom. Those who attended private high schools are particularly open to device limits or bans—51 percent compared to 40 percent of those who attended public high schools.

- Fewer than one in five respondents are very familiar with their college's policies regarding the use of personal devices on campus networks, and students who are computer science majors are even less likely to be very familiar, 7 percent. One in 10 of the full sample are not at all familiar.

Focus on Connectivity

Not having reliable, fast access to the internet is frustrating to students, whether they're in class, in the library or outdoors. Just 20 percent of respondents say campus Wi-Fi is very reliable in all or most areas, and 37 percent say it's very reliable in some areas (such as in buildings).

Reliability only in certain locations isn't enough for most students. For example, Wilson College in Pennsylvania has an equestrian center, farm and athletic fields in a location close to campus that was not connected to the campus network. It was difficult to stream events and ballgames or conduct other tech-enabled tasks in those locations, says Amy Diehl, chief information officer.

Her first task after arriving on campus in early 2021 was to get those areas connected. Now, events and games can be livestreamed directly from the fields and facilities. In addition, Diehl is working with a provider to assess the Wi-Fi network across campus and improve it as needed.

Diehl views powerful Wi-Fi as an ongoing priority for college campuses. "There's an ever-growing need for data, an ever-present challenge to make sure wireless capabilities are robust and

eliminate dead spots," she says.

Unreliable Wi-Fi can impact learning. Evan Richwalsky, a student at John Carroll University in Ohio anticipating graduation in 2024, says that in spite of a Wi-Fi infrastructure upgrade, he experiences ongoing difficulties. For example, when an in-class activity involves use of an online resource, "there are always some students who have issues accessing it because of bandwidth," Richwalsky says. "Professors often end up having to put students in groups or something so we can share resources since the Wi-Fi won't let us all access it."

Similarly, Richwalsky says he and his classmates have experienced connectivity problems when taking tests online. "We may have to move rooms, stagger our start times. Or the professor might have to schedule a pen-and-paper retake for the next class period."

A survey respondent from a public institution in California commented that the connection speed in the library is particularly troublesome and that sometimes it's not even possible to get on Wi-Fi there. Another, from a community college in Ohio, wrote about the system not responding in the middle of an exam and having to ask the professor to reset it. "Some of the professors act like we're lying that there are still a lot of glitches."

Almost 50 percent of Student Voice survey respondents say their online classes are often or sometimes interrupted by glitches. The problem is fairly prevalent in person also, with 38 percent of students saying these classes are often or

sometimes interrupted by technology not working properly.

While campus Wi-Fi connectivity may sometimes be the glitch culprit, “there are many variables at play,” especially with online classes, says Matthew McFall, chief information officer at Wallace State Community College, in Alabama. When a student is taking an online course off campus, a smooth experience will depend on the student’s Wi-Fi connection, the professor’s Wi-Fi connection and the institution’s learning management system.

“The institution controls only one variable, the LMS,” McFall notes. “All the time, we get people reporting that Blackboard or Canvas are not working, when the LMS actually is working, but users don’t realize that a successful online class depends on a number of other variables.”

Rebecca Hoey, provost and senior vice president for academic and student affairs at Dakota State University, in South Dakota, has a theory around tech glitches being almost as common in on-campus classes as in off-campus classes. “It’s probably not about networks failing. If it’s not happening systematically, the problem is usually more about human error or specific devices.”

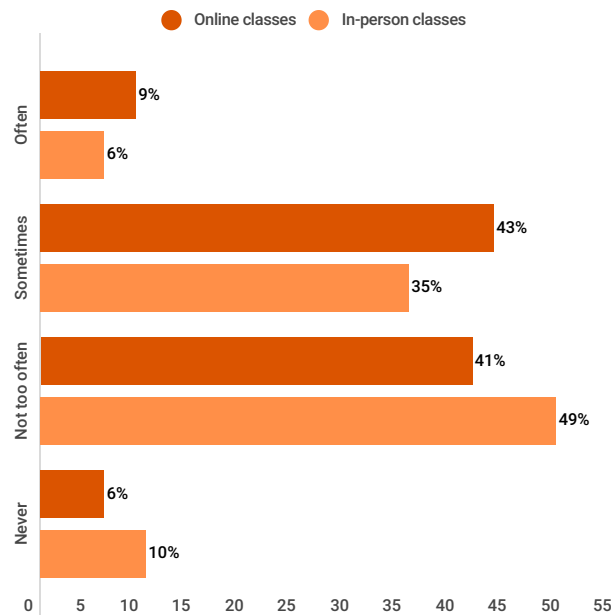
Technology’s Role in Teaching and Learning

Forced campus closures during the pandemic created a generation of students and faculty who are more comfortable than ever before learning and teaching digitally. In addition, changing demographics and cost pressures make online

Classes Get Glitchy

Student-reported frequency of classes being interrupted by technology not working properly

Note: Results listed with “not applicable” responses filtered out



Source: *Inside Higher Ed*/College Pulse survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and College Pulse collaboration, is presented by Kaplan

learning more feasible for many students. For many campus tech teams, figuring out how to provide the right technology to allow students to learn in the ways they want to learn is a top priority.

About half of survey respondents have taken a flexible class with the option to attend each class session in person or online. Students at four-year colleges were much more likely to have had that option than those at two-year colleges, 53 percent compared to 22 percent.

Tom Andriola, vice chancellor for IT and data at the University of California, Irvine, believes providing such options will become increasingly important. “For some students, being able to control costs by doing more online is helpful, and even in universities that are built around a residential experience and being part of a community, sitting in an 800-seat lecture hall isn’t very personal,” he says. “My role is to push this issue as an optionality topic rather than just an online topic. Optionality allows students to consume the content how they want to, when they want to, which is consistent with how the rest of our lives are moving.”

Not every type of class works well with the option for students to attend in person or online, but when it’s possible, increasing numbers of IT leaders are committed to providing classrooms and professors with the equipment needed to make it happen. “We’ve expanded access so students can take advantage of learning the way they want to,” reports Hoey at Dakota State.

In addition to recognizing student choice in methods of teaching and learning, IT leaders are wrestling with how—and whether—to incorporate tech trends into campus classroom. Take the metaverse, for example, being increasingly used within higher ed. But when asked

about their interest in attending classes in the metaverse, 55 percent are not too or not at all interested.

Older survey respondents are more interested than younger students in these virtual reality classes that involve teachers and students “meeting” in the metaverse. Of respondents age 18 or younger, 39 percent (plus or minus 9 percent margin of error) are very or somewhat interested, and that inches up to 44 percent for those age 19 to 23 (plus or minus 2 percent) and to 55 percent for those age 24 to 29 (plus or minus 9 percent). Among those age 30 to 39 (plus or minus 10 percent), 71 percent of students are interested.

Perhaps these figures reflect older students’ interest in learning remotely, or an older generation’s established ideas about synchronous learning.

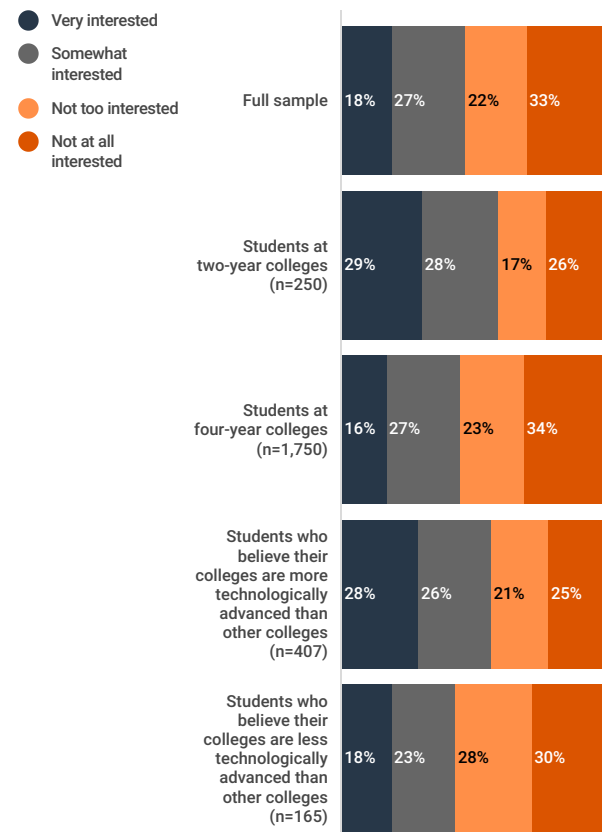
Students at community colleges also tend to like the idea more than those at four-year colleges.

“I’m always interested when we try to recreate a face-to-face experience for online students,” Hoey says. “Students who study online don’t necessarily do it because they live too far away to make it to class. They’re working, or they have children at home or in sports. Trying to recreate face-to-face requires them to be in a certain place at a certain time. We keep trying to force what people in a certain generation believe class should be like rather than focusing on freedom.”

Despite the need for choice in where and when to attend class, Andriola from UC Irvine ex-

Who Wants to Learn in the Metaverse?

Students who say they’re interested in learning through virtual reality class meetups



Source: *Inside Higher Ed/College Pulse* survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and College Pulse collaboration, is presented by Kaplan

pects that metaverse experiences will become increasingly important on campus. “Employers tell me they expect that employees who come to them in five to 10 years will have experience from university in the metaverse, due to the way meetings and work will be conducted,” he says.

Some UC Irvine faculty members are working on developing ways to interact with the metaverse through the teaching and learning process, but “we’re in the early stages,” Andriola says. “This is not just about the classroom, but the overall campus experience. We will see more metaverse experiences embedded in student groups and activities as well.”

The User Experience

As noted, nearly four in 10 students surveyed would like to see their online student portal get improvements.

Dakota State is one institution currently prioritizing a portal upgrade, with the goals being to help it become more intuitive and user-friendly, says Hoey. “Students are very familiar with Amazon, YouTube and other sites created by web-design experts, but often our student portals are a hodgepodge managed by different departments rather than expertly designed and centrally managed. For students, the portal is a big part of their experience.”

The new version will take advantage of internal web-design experts. While most campuses have creative teams available for marketing work, they haven’t traditionally been used to develop tools like the student portal. With an increased

focus on student experience, Hoey is hopeful that will change.

Another important factor for student experience with campus technology is the ability to conduct campus business from a smartphone. In the Student Voice survey, 31 percent of students said it was somewhat or extremely difficult to buy a textbook on their phones, and 38 percent said it was somewhat or extremely difficult to drop or add a course on their phones.

However, IT leaders view these tasks via mobile as less difficult: 14 percent of CIOs in *Inside Higher Ed's* survey say it is somewhat or extremely difficult for students to purchase textbooks on their phones, and 24 percent believe it is somewhat or extremely difficult to change an academic course on their phones.

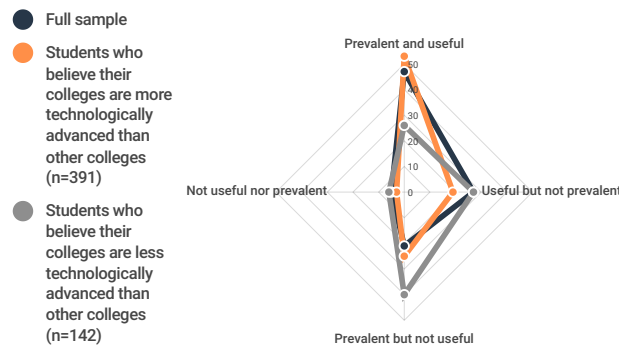
"We have to recognize that students live on their phones, and we have to make sure administrative tasks can be done on their phones," says Diehl at Wilson College. "We need to push our vendors to make sure their software is mobile-friendly. My job is to push our vendors—tell them what our needs are and push them to continue developing their products to be more advanced and intuitive."

If it's not easy to purchase books through campus structures, students can always turn to other, more intuitive providers. "I was surprised so many people said it was difficult to buy textbooks on their phones," Richwalsky says, adding that even if it's difficult through the campus store, sites like Amazon and Chegg make it easy. "That's how I purchase many of my textbooks."

Communication Through Digital Signage

How students see digital signs on their campuses

Note: Responses filtered to include only those who are aware of digital signs on campus (93%); hover over each dot in chart to see %



Source: *Inside Higher Ed/College Pulse* survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and College Pulse collaboration, is presented by Kaplan

Digital signs on campus also contribute to a student's campus experience, providing event information and other campus announcements, as well as content such as news and weather. Forty-four percent of responding students said digital signs are both prevalent and useful on their campuses, and 20 percent said they are useful but not prevalent.

"Digital signs can be great, but they can get outdated quickly," says Wallace State's McFall. "A

lot of institutions don't put time into the content; I've been at institutions where individual departments were responsible for their own signs, so there was no standard look or approach."

At Wallace State, the marketing team is responsible for the content on all campus digital signs to achieve a common design and practice.

Still, some students are more apt to rely on information delivered directly or via social channels. "We get a daily email at 4:00 a.m. with announcements, and I also keep track on social media," says Richwalsky.

Prioritizing Cybersecurity

IT leaders find it concerning that fewer than half of survey respondents say they are somewhat or very worried about the threat of cybersecurity breaches or cyberattacks on their campus.

"I don't know if that means they are confident in their IT department or they just don't care," says McFall of Wallace State. "We block phishing emails every day and constantly update security. Many students are oblivious and have no real concern about privacy."

A July 2021 [Student Voice survey](#) of 2,286 undergraduates found that most students were unaware of just how much data their institutions have about them—but also that they were not overly concerned about it. The majority of students had no concerns about the handling of their attendance, grades or enrollment data, and nearly half had no concerns about their course engagement behavior data or their financial information.

While faculty members can be compelled to attend cybersecurity training, the same can't be said for students. Twice in a recent week, McFall says he sent out campuswide announcements about suspicious emails to avoid. Like other institutions, Wallace State also hosts optional cybersecurity-awareness sessions for students.

"We have to teach cybersecurity like a life skill," says UC Irvine's Andriola. "Students will spend the rest of their lives in a threat landscape."

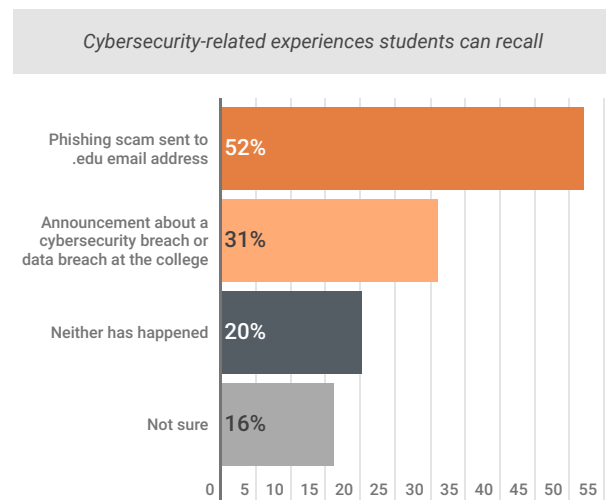
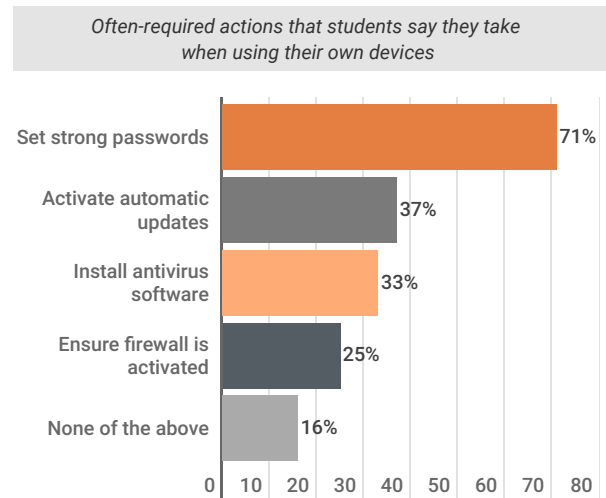
Besides finding new ways to educate students about vulnerabilities, IT leaders are taking steps to mandate secure access to campus networks. More campuses are requiring multifactor authentication (MFA) for users, for example.

Users don't always appreciate this step. A survey respondent at a North Carolina public university wrote about the frustration of managing two-factor authentication in buildings with weak Wi-Fi signals. "I can't mark 'safe' devices and ... sometimes I'm stuck walking up and down the halls of buildings, even stepping out of buildings just so I can log into my university account. It feels unnecessary, clunky and on one occasion was the straw that broke the camel's back leading to a full-on breakdown."

"If a hacker does get through with a phishing email, they may have the user's credentials, but with MFA, they can't connect to the system without a second factor," Diehl says, whose institution recently installed it for students, faculty and staff. "Sometimes, colleges and universities prioritize installing MFA for faculty and staff and leave students out. But a compromised student

IT Security Steps and Alerts About Problems

Student actions and experiences related to network and data security



Source: *Inside Higher Ed/College Pulse* survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and *College Pulse* collaboration, is presented by Kaplan

account can also cause damage to your system."

To be successful, those cybersecurity initiatives cannot compete for funds with other campus technology projects. At Indiana University of Pennsylvania, cybersecurity investments are prioritized above all other technology investments.

When officials there made the recent decision to implement multifactor authentication across campus, "we took the funds needed off the top of our technology budget," says Balint. "That money is not even available when we start making decisions about classroom technology and other tech investments."

Technology Input

As noted, the vast majority of survey respondents believe students should have some or a significant amount of input into the technology investments their institution makes. Thirty-five percent say their institution does that through student surveys, 24 percent say student leaders are asked to give input and 19 percent are aware of small focus groups conducted for this purpose.

Indiana University of Pennsylvania's IT department surveys its faculty IT committee and its student subcommittee before making decisions about technology investments. However, because student opinions vary so widely, taking their input into consideration is tricky, says Balint.

When students were asked to select which technology aspects they'd most like to see improved on their campus, only one of the 21 different

options (better Wi-Fi) received a nod from more than half of respondents; nine other options were chosen by at least 25 percent.

“If we think students have a common view of technology, this survey shows us they don’t,” says Balint. “Their opinions are often very localized and based on their academic program, whether they’re on campus, hybrid or distance only. No matter what you do, there will be a majority of students who don’t care or don’t think it’s an important investment. Our general rule of thumb is to decide which investments can help the most students the quickest.”

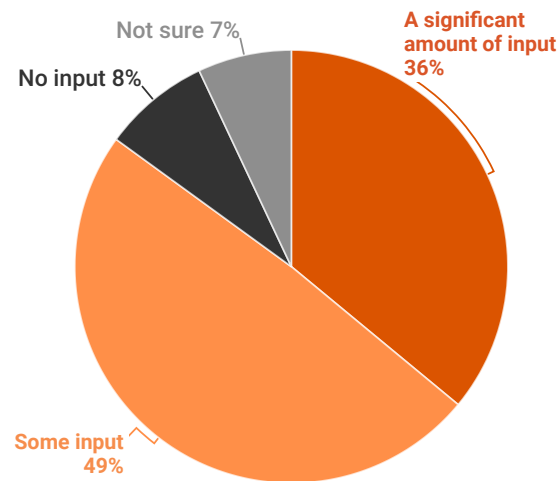
In addition, IUP’s technology team looks at what technology investments are most important to student success, using a broad definition of that term, Balint says. For example, with limited dollars available, is it more important to make it easier for students to drop and add courses using their phones or to implement smarter classroom technology?

“We might say, ‘Well, it may not be simple to drop and add with a phone, but we have tons of computing stations on campus where they can easily do it online,’ so classroom technology may win,” he explains.

While student input is important for making decisions about campus technology, some campus leaders warn that catering to the whims of current students could mean your campus won’t be prepared for the needs of future students. The opinions of current students are valuable but must be combined with industry knowledge and forecasting.

Getting a Say in Tech Investments

How much input students believe they should have about institutional investments in technology



Source: *Inside Higher Ed/College Pulse* survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and *College Pulse* collaboration, is presented by Kaplan.

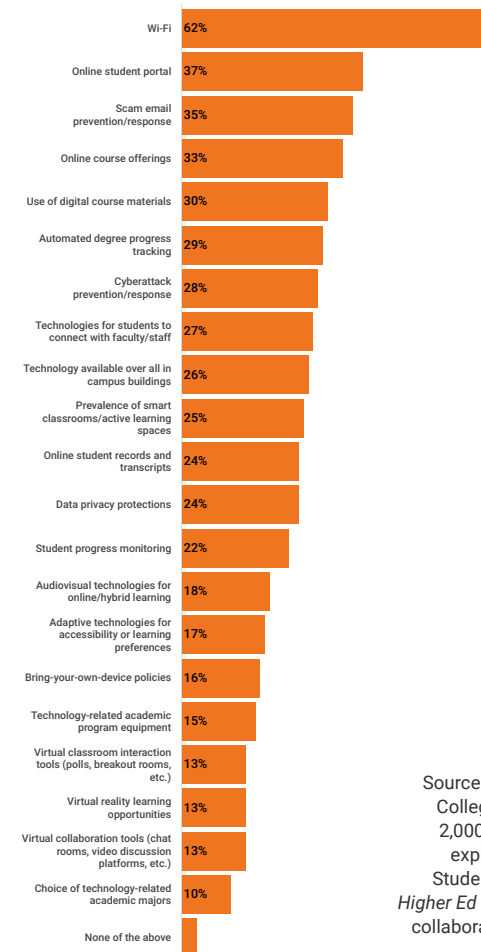
“We’re not just focusing on student expectations but also on taking the technology as far as it can go,” says Andriola at UC Irvine. “It’s not just an issue of what students want now but also how technology will continue to transform the campus experience and the future of teaching and learning.”

[ARTICLE HERE](#)

<https://www.insidehighered.com/news/2022/11/01/survey-campus-technology-student-priorities-and-problems>

Students’ Tech Priority Wishes

What aspects of technology students say they would like to see their colleges improve



Source: *Inside Higher Ed/College Pulse* survey of 2,000 college students; explore the data [here](#). Student Voice, an *Inside Higher Ed* and *College Pulse* collaboration, is presented by Kaplan.

Improving student success

5G enables more personalized, connected, and dynamic campuses.



Next-generation student success

The continued dominance of hybrid learning, growing enrollment challenges, and an increasingly diverse student body are driving colleges and universities to embrace technology solutions to promote student success.

Students today often balance coursework with caregiving, job responsibilities, and managing their own health and wellbeing. The strain of these demands can push students away from traditional higher education environments. Meanwhile, bootcamps and certificate programs give students more options when it comes to career development.

As student life becomes more complex, students are looking for a more flexible, personalized education that accommodates competing priorities. A **smart campus**, equipped with connected IoT sensors and devices, can help you tailor educational resources for individual student needs, reduce barriers to education, and promote a holistic vision of student success.

T-Mobile® for Education helps higher education institutions like yours drive student success with connected technologies. With our leading 5G network and 24/7 expert support, we're ready to help you discover and implement the solutions to support your goals.

Here's how a digitally connected campus can support student success:



Prioritize equity and access

The future depends on empowering all students with knowledge and opportunity. T-Mobile for Education shares those values—we're committed to making technology resources more accessible to underserved communities.



Devices and broadband access

Now more than ever, it's critical to equip students with the devices and internet access they need to succeed in a hybrid learning environment.

- Hotspot checkout programs give students opportunities to access online learning from virtually anywhere.
- T-Mobile for Education offers faculty, staff, and students discounted plans with Unlimited talk, text, and data.

1 in 4 college students struggle with coursework due to unreliable internet.¹



Drive digital literacy

Digital literacy is an essential skill for classroom and workforce success.

- For students and educators alike, digital fluency is critical for a successful blended learning environment.
- T-Mobile for Education helps colleges and universities identify curriculum-development opportunities to drive digital literacy.

Through Project 10Million, T-Mobile paves the pathway to higher education by providing K-12 students with the digital resources they need to succeed.

The T-Mobile Commitment: Thurgood Marshall —scholarship and mentorship

In partnership with the Thurgood Marshall College Fund, the T-Mobile Magenta Scholars program is donating \$500,000 to create 18 scholarships for students attending historically Black colleges and universities (HBCUs).

Scholarship recipients can also join our signature summer internship program and receive mentorship and professional development opportunities.

Make hybrid instruction more engaging

New technologies enable the personalization and flexibility that make online courses more engaging and effective. Nearly 80% of undergraduate students feel online courses lack the engagement of in-person classes.²



Flexible learning

Hybrid instruction allows students to access material in a way that works best for them, whether that be in-person or remote.

- Video conferencing and livestreams allow for virtual attendance.
- Augmented and virtual reality expand possibilities for in-person and virtual classes.
- AI-powered assistants and tutors provide personalized assistance.



40% of students say having more flexible learning options is very important.⁴



Improved digital access

Integrated technology has the added benefit of increasing access for a wider range of student needs.

- Natural Language Processing services translate dialogue into text in real time.
- Adaptive learning platforms promote personalized education journeys.

For students, video captions increase retention and comprehension for all learners, not just those who need them most.³



Enhanced learning analytics

Enhanced data analytics identify obstacles to graduation and systemic issues that otherwise would go overlooked.

- Online education generates useful data on student behavior and performance that can be used to influence future courses to make them more effective.
- Personalized course selection recommendations provide customized educational journeys.

Data offers an unbiased view of teaching or organizational inefficiencies.

Enhanced student life improves classroom success

Student success is often impacted by what happens outside of the classroom. Today's students expect high-speed internet access everywhere, including on campus grounds and in their dorms.



Accessible mental health services

Mental health has been a serious concern for students for years—but recent years have brought increased mental and emotional distress that's impacting student performance.

- Improved connectivity fosters communication within student support networks.
- Virtual access to on-campus mental health resources expands accessibility.



88% of students believe there's a mental health crisis at U.S. colleges and universities.⁵



Campus-wide communication

Institution-wide communication strategies share information—from how to access important resources to graduation requirements—effectively and equitably.

- Digital wayfinding helps students and visitors locate facilities.
- Digital signage displays important and timely information to students, staff, and visitors.
- Parking space sensors manage campus traffic, benefiting student commuters.



70% of colleges and universities have installed digital signage on campus.⁶



Internship programs and student recruitment

Career readiness is a priority for many students. T-Mobile for Education works with colleges and universities to develop internship and recruitment opportunities for students.

- Internship opportunities give students direct access to hands-on work experience.
- Mentorship with senior leaders reinforces career skills.
- Opportunities are available for STEM and non-STEM students across a range of departments.



Career readiness was a leading concern for 84% of students and educators in 2021.⁷



A trusted technology partner

Improved connectivity is the path to more engaged students and a staff well-equipped for the future of higher education. **Explore more higher education technology trends with the T-Mobile for Education Guide: Student success through innovation.**

T-Mobile for Education supports the modernization of higher education institutions with 5G-enabled devices, discounted plans, and the nation's largest and fastest network—so you no longer need to compromise your goals due to cost or complexity. Together, we can build an infrastructure for the future of learning.

T-Mobile for Education is ready to support your campus's initiatives. Visit **T-Mobile/HigherEd** or call **1-877-352-0786** to learn more.

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The State of Higher Ed Technology: A Survey of CIOs

Doug Lederman · October 25, 2022

Fewer than a quarter of college and university technology leaders are very confident that their institutions can prevent ransomware attacks. Most are struggling to hire and retain technology employees. And just four in 10 say they believe senior administrators at their institution have made digital transformation a high priority, even after the COVID-19 pandemic laid bare the importance of agility and adaptability.

Those are among the findings of *Inside Higher Ed's* 2022 [Survey of Campus Chief Technology/Information Officers](#), its first-ever such survey. The technology survey, conducted in partnership with Hanover Research and released in conjunction with the Educause annual conference that begins today, joins Inside Higher Ed's studies of other key campus leaders, alongside those of presidents, provosts, chief academic officers and admissions directors. A copy of the report can be downloaded [here](#).

Technology has played an increasingly important role at most colleges and universities in recent years, reshaping how institutions communicate with employees and students, manage their business processes, operate their facilities, and, to varying degrees at different institutions, deliver their education. At most colleges, technology isn't the strategy but is increasingly an enabler of it.

The survey sought to gauge how the senior-most technology leaders on campuses—most of

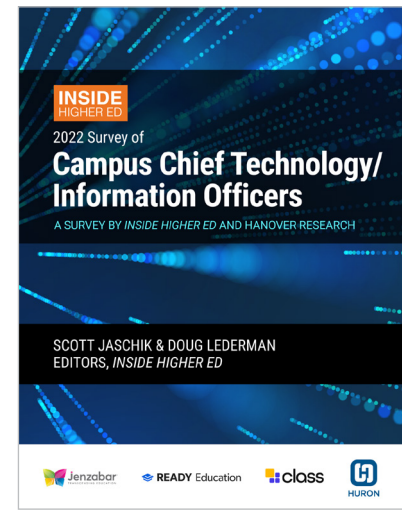
whom carry the title of either chief information officer or chief technology officer—view their institutions' efforts to use the ever-growing array of technological tools and capabilities to carry out their educational and other missions and operate more effectively and efficiently. (This article uses the terms “CIO” and “CTO” interchangeably to refer to the survey's respondents.)

A bifurcated picture emerges from the 175 respondents. At about two-thirds of colleges, the chief technology or information officer is on the president's cabinet, with about one in six of those added during the pandemic. Technology leaders at those institutions are far likelier than their peers to say that their institution has made digital transformation a priority (52 percent versus 24 percent), and far less likely to agree that senior administrators at their college treat the IT unit “more like a utility than a strategic partner” (42 percent versus 70 percent).

IT leaders who are in the executive cabinet are significantly likelier to agree that their institution “makes data analytics a strategic priority” (68 percent versus 45 percent) and “has buy-in across departments regarding the importance of sharing and analyzing data” (60 percent versus 38 percent).

Other highlights of the survey's findings include:

- Most respondents strongly agree that their institution has technology that makes re-



mote/flexible work viable for employees, but only half agree that their institution has policies that encourage remote/flexible work.

- CIOs are generally upbeat about their colleges' ability to offer high-quality virtual instruction, and most agree that their institution upped its game during the pandemic. Tech leaders also generally agree that their institutions provide technical and instructional design support for faculty members but don't believe they give instructors credit for digital pedagogy or teaching with technology.
- Fewer than a quarter of tech leaders are very or extremely confident that their cybersecurity policies can prevent ransomware attacks.
- Few CIOs report that their institution has

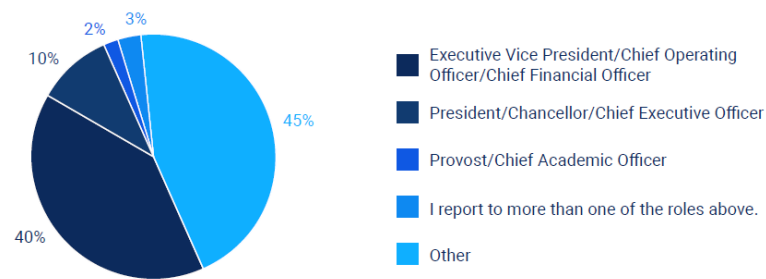
made meaningful investments in cutting-edge technologies such as virtual reality or immersive learning (38 percent say they have at least begun investing) or adaptive learning (44 percent say they are considering investing).

Why Structure Matters

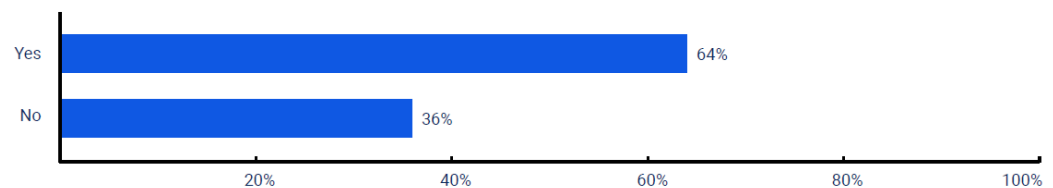
The survey's questions and results can be divided into several broad categories: how technology is managed and prioritized within institutions, including budgetarily; campus technological infrastructure and support; and the role technology plays in campus work and in teaching and learning.

Reporting lines and structures are rarely newsworthy. But in many organizations, including colleges and universities, how decisions are made and who is involved in making them can help determine what decisions are ultimately made, which matters a lot. So in crafting this initial survey of chief technology/innovation officers, *Inside Higher Ed* and Hanover sought to understand institutions' structure for managing the role of technology.

Two key questions suggest that CIOs and CTOs are generally well positioned to be influential in their institutions: the vast majority report to either the most senior administrative officer (45 percent) or directly to the president (40 percent), with most of the rest to the provost/senior academic officer. About two-thirds are on the executive cabinet or council at their institution, with 15 percent of those joining the president's team of closest advisers during the pandemic.



Are you on the president's/chancellor's executive cabinet or council at your institution? (n=175)



CIOs at public doctoral universities are the likeliest to report directly to the president, at 52 percent, followed by those at private master's and baccalaureate institutions (41 and 44 percent, respectively). CTOs at community colleges (54 percent) and private doctoral institutions (57 percent) are likeliest to report to the executive vice president or chief operating officer. Four in five tech leaders at public doctoral institutions (79 percent) are on the president's cabinet, with the other sectors all in the 60 to 65 percent range.

CIOs at nondoctoral universities and the central IT units they lead tend to have a wider set of responsibilities than their peers at public and private research universities.

Virtually all CTOs are responsible for administrative technology, telecommunications and academic technology. But while between two-thirds and three-quarters of CIOs over all say

they provide support for online education, media services, institutional research and campus teaching and learning centers at their institutions, tech leaders at two-year and four-year nondoctoral institutions are much more likely to do so than their doctoral university peers.

Bigger (and wealthier) institutions are also much more likely to have specific senior officers responsible for key functions such as cybersecurity, data analytics and online education. The overall proportion of institutions with a chief point person on these issues can be seen below.

But the gaps between institution types are significant: 43 percent of public doctoral university CIOs say their institution has a chief officer responsible for online education, compared to 24 percent of community colleges and 29 percent of private baccalaureate colleges. Nine in 10 public doctoral universities and eight in

10 private doctoral institutions have a cybersecurity czar of sorts, compared to 70 percent of public master’s institutions, 59 percent of community colleges and about half of nondoctoral four-year private institutions.

Budgets and Human Effort

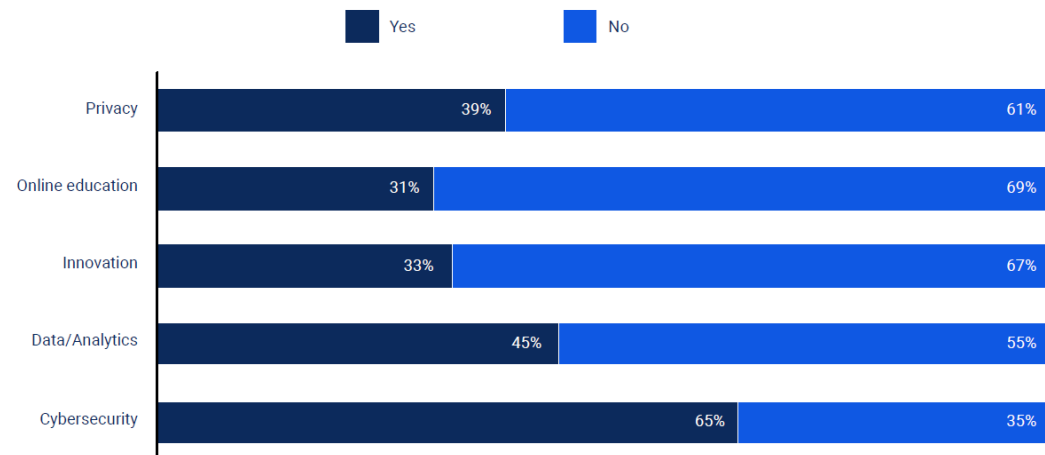
Another set of questions sought to understand the scope (and cost) of campus technology resources and how they were distributed across the institution.

The budget data showed enormous, and unsurprising, variation, given the great differences in size and complexity of institutions in the higher education ecosystem. A majority of colleges and universities reported centralized IT budgets of between \$1 million and \$5 million (37 percent of the total pool of institutions) or \$5 million and \$10 million (22 percent), with 12 percent of institutions (and a quarter of four-year baccalaureate colleges) spending less than \$1 million and 16 percent (68 percent of public doctoral institutions) spending at least \$20 million.

The 2021–22 academic year was one in which [many colleges faced enrollment](#) challenges but benefited from [federal aid](#) to [help institutions](#) and students navigate the COVID-19 pandemic.

About four in 10 CIOs (42 percent) said the central IT functions at their institution experienced a budget cut in the 2021–22 academic year. Those reductions were disproportionately reported at public master’s universities (by 65 percent of CTOs at those institutions) and at private doctoral universities (57 percent).

Does your institution have a chief or senior technology officer who is primarily responsible for overseeing any of the following areas?



Those institutions were also likelier than their peers to expect their 2022–23 budgets to shrink below their 2021–22 levels. Over all, more technology officers expected their 2022–23 budgets to increase (31 percent) than to decline (22 percent), but the reverse was true for private doctoral universities (26 percent expected the 2022–23 budget to be lower versus 17 percent higher) and public master’s institutions (35 percent predicted lower versus 15 percent higher).

For many years, Kenneth C. (Casey) Green published the Campus Computing Survey, which was last produced in 2019; *Inside Higher Ed*’s new survey aims to partially fill the gap left in its wake. Green said the anticipated reductions in IT budgets are “striking—and disappointing ... given that IT assumed an even larger and even more essential role in instruction and campus operations during the pandemic.”

One of the perennial discussions about how technology is managed on campuses is about the degree to which it should be centralized as opposed to left to individual campus departments and units to oversee. Many discussions about shared services and other attempts to centralize technology and other services run aground amid arguments by faculty and staff in individual departments that their needs take a back seat.

This survey sought to gauge how colleges and universities are currently allocating their technology resources, centrally or dispersed through the institutions.

CIOs were asked how many technology employees were managed through the central IT unit as opposed to by individual academic departments and administrative units, as seen in the charts below.

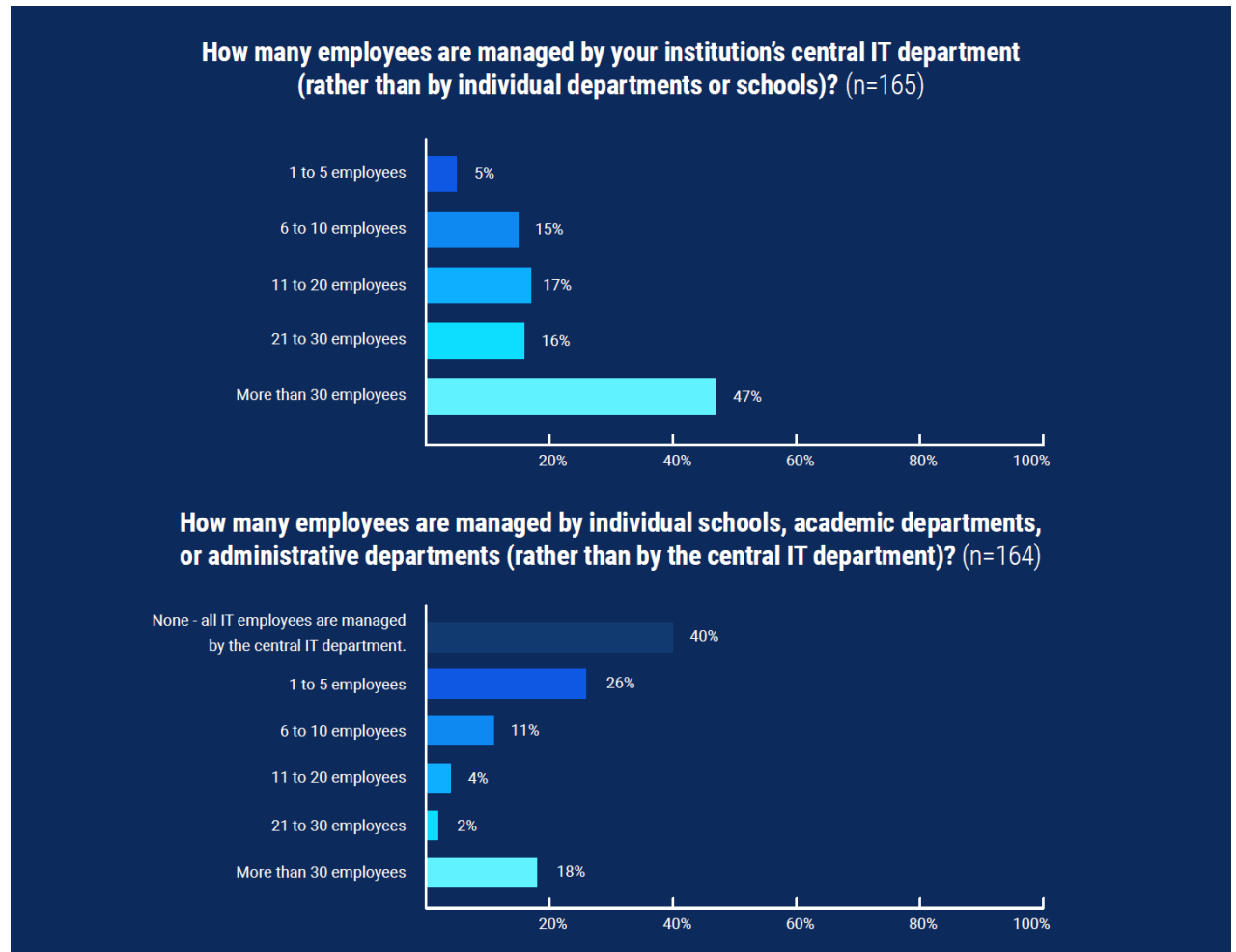
About four in five CTOs (79 percent) reported that their central IT unit had more employees than were managed by disparate units at the institution. But about a fifth of CIOs—mostly at larger institutions with dozens of technology employees—said individual units employed as many or more employees than did central IT.

Distribution of Technology Employees	
Central IT has more employees	79%
Both central IT and individual schools/departments have more than 30 technology employees	17%
Central IT and individual schools/departments have same amount of employees (less than 30 employees)	3%
Individual schools/departments have more employees than central IT	1%

At most institutions, the central IT unit manages most key technology functions, such as setting technology policy and ensuring cybersecurity (90 percent each), managing infrastructure (82 percent) and personal devices (64 percent), and providing tech support for students (69 percent).

But functions such as hiring of technology employees, managing specific technology applications for both academic and nonacademic purposes, and technology support for faculty members are split more equally between central IT and the individual units in question.

CIOs from public doctoral institutions are much likelier than their peers to say that functions such as tech support for students and professors and application management are joint responsibilities between central IT and departments, reflecting the comparatively significant



authority of academic and other departments at those institutions.

The Role of the CTO and Technology Decision-Making

Arguably more important than the details of how institutions' technology operations are structured and supported is the question of how

they make decisions about the role of technology, which ultimately is what matters most.

But the survey's data suggest that the two issues are interconnected.

Several questions sought to gauge how technology leaders envision their roles and that of technology and innovation at their institutions—and,

importantly, how they think others view it.

CTOs answered one set of queries about how leaders at their institution viewed the central IT unit.

Over all, about half of respondents strongly (19 percent) or somewhat agreed (33 percent) that “senior administrators at my institution treat the central technology unit more like a utility than a strategic partner.” Thirty-nine percent disagreed.

There were sharp divisions by sector: tech leaders at community colleges, public master’s universities and private baccalaureate colleges were likeliest to believe leaders saw technology departments as units to carry out specific functions rather than as influential in setting direction.

The gaps were particularly wide based on campus structure. A full 70 percent of CIOs at colleges where they were not in the cabinet and 60 percent who did not report to the chief executive officer said administrators viewed them as utilities, compared to about 40 percent where the reverse was true.

Perhaps unsurprisingly, behavior follows perception. The survey asked CTOs whether their units performed more like utilities or like strategic partners at their institution, and while nearly six in 10 over all said their unit played a key role in strategy setting, technology leaders at public master’s universities (64 percent) and community colleges (41 percent) were most likely to agree at least somewhat that their department operated more like a utility.

CIOs who sat on administrative cabinets or

To what extent do you agree or disagree with the following statements related to your institution's central IT department:									
	All Institutions, by Sector			Public			Private Nonprofit		
	All	Public	Private Nonprofit	Doctoral	Master's/ Bacc.	Assoc.	Doctoral	Master's	Bacc.
Senior administrators at my institution treat the central technology unit more like a utility than a strategic partner.									
% Strongly disagree	16	14	18	22	5	13	23	19	11
% Somewhat disagree	23	22	25	26	21	19	27	23	26
% Neither agree nor disagree	9	6	11	4	11	6	14	15	6
% Somewhat agree	33	41	25	37	58	34	9	19	40
% Strongly agree	19	17	21	11	5	28	27	23	17

reported directly to the president were also much more likely to say their department behaved like a strategic partner.



Every tech leader at a higher education institution has as a primary obligation the responsibility to identify ways to ensure that the maximum proportion of resources are going to the academic enterprise.



Similar patterns emerged around a set of questions about “digital transformation.” That buzzword means many things to many people. [Educause defines](#) it as “a series of deep and coordinated culture, workforce and technology shifts that enable new educational and operating models and transform an institution’s operations, strategic directions, and value proposition.”

[A project at Brown University](#) characterizes it as “the purposeful creation of a cohesive digital ecosystem that provides faculty, staff, students and alumni with the tools and capacities needed to support education and research, business operations, volunteer engagement, and communications, and which are optimally integrated with each other to support data-sharing and efficient maintenance.”

The survey takes as a starting point—though certainly some people in higher education may dispute it—that most colleges are (or need to be,

to varying degrees depending on their missions) on a path to preparing for a more digitally focused present and future.

The survey doesn't ask CIOs whether they think digital transformation is necessary at their institutions; it's taken for granted that they do. But they were asked how important digital transformation is for leaders at their institution. Roughly four in 10 said it was either essential (10 percent) or a "high priority" (32 percent), while about one in six said it was either a "low priority" (12 percent) or not a priority at all (4 percent).

There were some differences by sector: the proportion saying it was either essential or a high priority ranged from 31 percent at private master's universities to 49 percent at public doctoral and private baccalaureate colleges.

But as with the question about utility versus strategic partner, the differences based on the technology structure at the institution were far sharper.

More than half of the CIOs who were in the cabinet at their institution (52 percent) said digital transformation was a key priority at their institution, compared to 24 percent of those who were not in the executive group. And 59 percent of technology leaders who reported directly to the president or chancellor said digital transformation was highly important to their leaders, compared to 32 percent who reported to someone else.

Mark McCormack, senior director of research and insight at Educause, said the organization

has tried in [reports such as this one](#) to explore how CIOs can be most effective and influential.

Educause's own research has shown that technology leaders benefit when they report directly to the president or sit on cabinets.

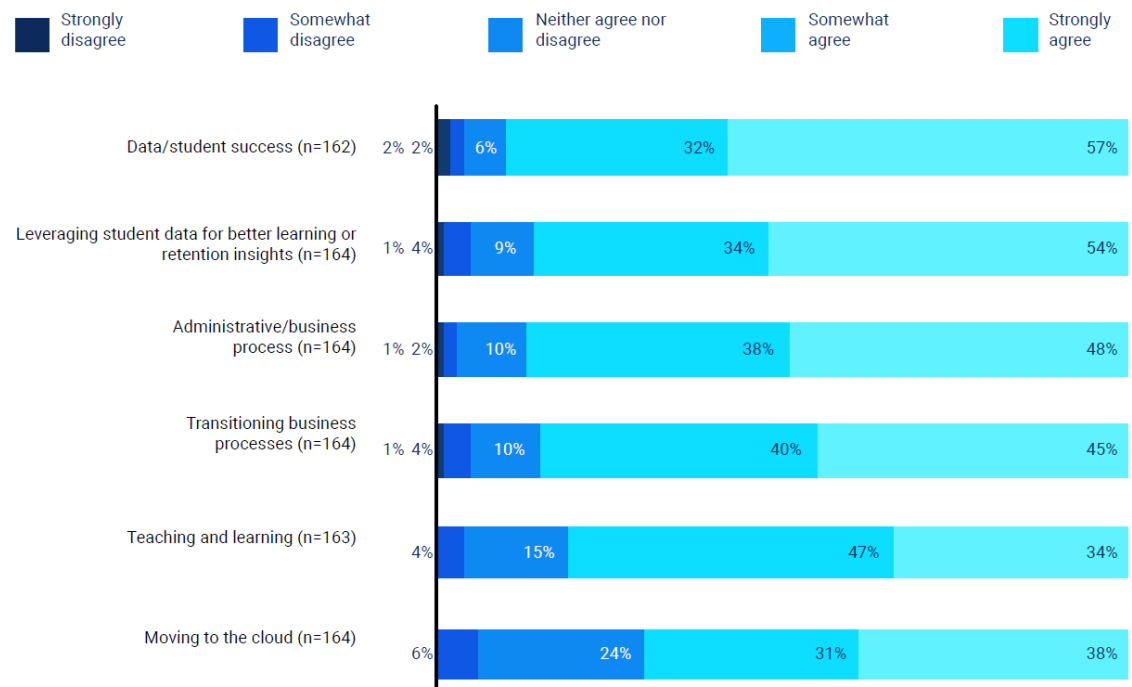
But he said via email that "when institutional leadership fosters a healthy culture of collaboration and partnership, those positions of power and direct access become less essential, and it frees us up to think creatively about other alternative institutional structures and reporting lines (like reporting to the academic officer,

which more closely aligns the CIO with the institution's missional priorities and activities around student success)."

Where do CIOs and their institutions see the most opportunity for digital transformation? The top two priorities relate to ensuring student success, followed by improving business processes and then teaching and learning.

But fewer than two-thirds of CIOs say their institutions have set specific goals for making their institutions more digitally focused, and those who have say insufficient financial investment

How much of a priority are the following focal areas in terms of digital transformation efforts?



(65 percent) and resistance among faculty and staff members (60 percent) pose the biggest obstacles.

About a third of CTOs cite goals that are incomplete or ineffective and lack of senior administrative support.

Mark Cianca, who joined Huron Consulting Group as a specialist in higher education last spring after serving as a CIO and in numerous other roles over 35 years at the University of California, said he was surprised that more tech leaders didn't identify moving their operations to the cloud as a major focus.

Asked which of their core technology systems they had migrated from being run on their own campuses to being run in the cloud through a web-based software-as-a-service platform, 87 percent of CTOs chose their learning manage-

ment systems and 70 percent cited their customer relationship management software (for communicating with students and other constituents), and just under half identified their human resources and fundraising systems. Far fewer said they'd made that move for budgeting, research administration and student information systems.

Cianca said CIOs increasingly need to be "identifying activities and behavior" their institutions are engaging in that "do not add value to the organization" and are not core to the academic mission. "Every tech leader at a higher education institution has as a primary obligation the responsibility to identify ways to ensure that the maximum proportion of resources are going to the academic enterprise," he said.

At most institutions, he said, "being in the busi-

ness of running a data center isn't part of the academic core."

Judging Their Own Performance

Another set of questions aimed to gauge technology leaders' perspective on what they and their institutions do well technologically and where they fall short.

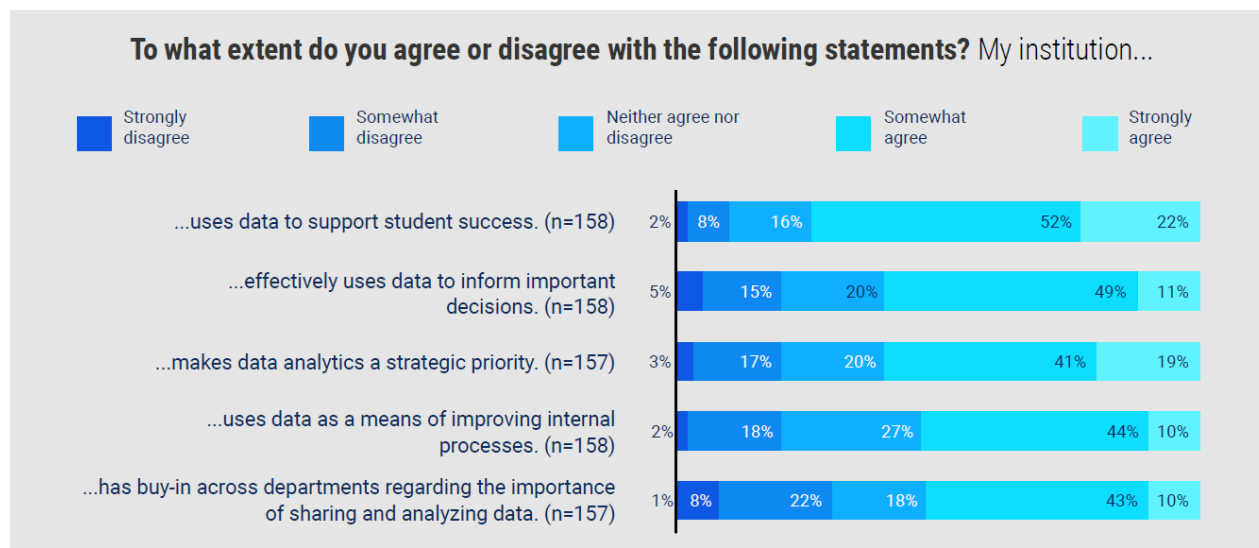
CTOs give themselves the best ratings on elements such as computer networks and data communication (94 percent rate it as excellent or good, 58 percent excellent), user support services (91 percent excellent or good), wireless networks (90 percent), the learning management system (87 percent), and audiovisual-enabled classrooms (86 percent).

They rate themselves least well on IT training for students (24 percent), mobile apps and services for students and employees (45 percent), disaster planning (50 percent), and IT training for instructors (51 percent).

Digging more deeply into a couple key functions, technology leaders acknowledge they have room to improve on how effectively their institutions use and analyze data.

Nearly three-quarters (74 percent) say they believe their institution uses data to support student success.

But only 60 percent say their institutions use data effectively to inform important decisions (only 11 percent strongly agree) or make data analytics a strategic priority (19 percent agree strongly).



Barely half agree that their college or university uses data to improve internal processes or has gained buy-in across the institution about the value of data use and analysis.

Liv Gjestvang, chief information officer at Denison University who previously spent 15 years in learning technology at Ohio State University, said she was heartened by the technology officers' focus on leveraging data to support student retention and success. But she said via email that areas such as institutional advancement, alumni engagement and enrollment management can all "reap huge benefits from increased data insights in their work, and CIOs and their teams have an opportunity to help align strategies and integrate systems to support data driven insights across the institution."

Other Findings

The CIO survey produced numerous other im-

portant findings. Among them:

Remote work and the IT workforce. Many higher education leaders are worried about employee turnover and burnout, and perhaps no departments are more vulnerable than technology units. While tech employees are comparatively well paid within higher education, gaps between what programmers, engineers and others with digital skill sets can earn on the open market are perhaps wider than is true for most other college and university workers.

More than half of CIOs strongly agree (51 percent, and 33 percent somewhat agree) that they are struggling to hire new technology employees, and 62 percent (27 percent strongly) say they're struggling to retain employees. Better salaries at other organizations (99 percent) and more flexible remote work policies (53 percent) are the biggest factors in their struggles, with

few seeming to think that employees see the work as less meaningful or think the institution is no longer pursuing its mission (9 percent each).

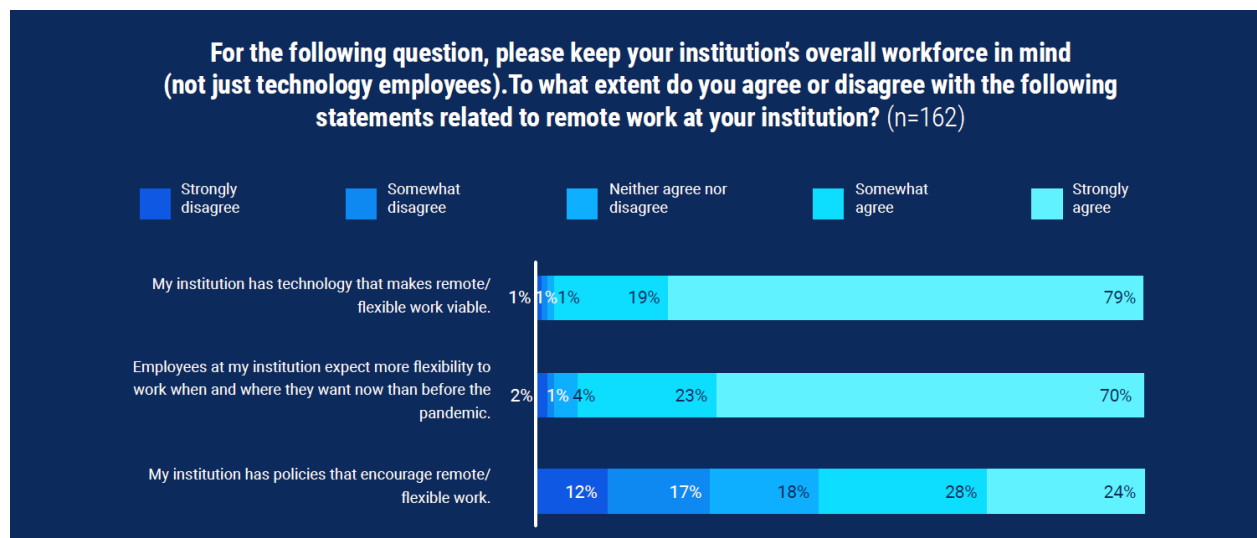
For all employees, CIOs also believe their institutions are well prepared technologically to enable remote work. But the tech leaders are not confident that their institutions have policies that will satisfy the growing number of employees that they believe want more flexible work arrangements, as seen below.

Digital learning and academic technology. Chief technology officers believe their institutions upped their game in digital teaching and learning during the pandemic—with a significant assist from the federal government.

Roughly eight in 10 CIOs agreed that their college or university's ability to offer high-quality online (84 percent, 42 percent strongly) and hybrid courses (77 percent, 35 percent strongly) "significantly improved" since the pandemic began. Eighty percent also agreed that their institution would "sustain" its ability to offer high-quality virtual learning.

Even more CTOs, 86 percent, agreed that their institution had used money from federal COVID recovery aid to improve its digital learning infrastructure. Most of that money has now been spent, which will force institutions to find other sources of funds to sustain or expand their support for technology-enabled learning.

CIOs rated their institutions much more highly on technical and operational support for learn-



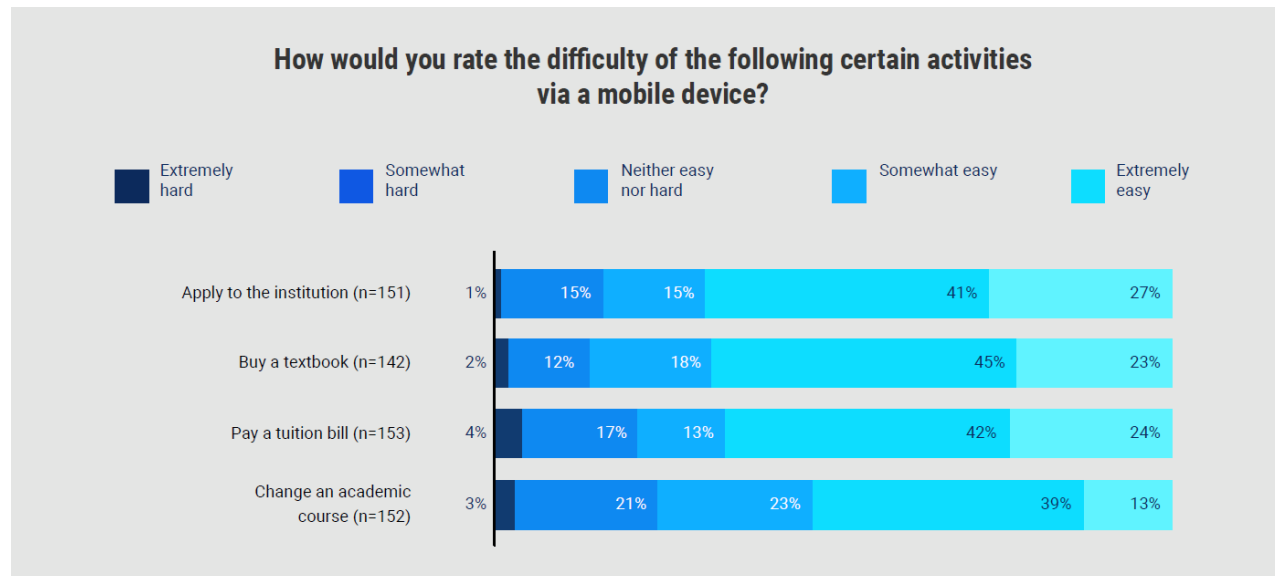
ing initiatives than on policies for motivating and rewarding instructors.

Three-quarters or more of tech leaders strongly or somewhat agree that their college provides technical support for teaching (91 percent) and creating (89 percent) online courses and invests in technology and instructional design resources to improve teaching and learning (78 percent).

About two-thirds say their institution has a “climate that encourages experimentation with new approaches to teaching, including with technology” (70 percent) and policies that “protect faculty members’ intellectual property rights for digital work” (67 percent).

The numbers decline further when CTOs are asked whether they agree that their colleges acknowledge the time demands of online courses on faculty workload (61 percent, only 18 percent strongly), provide additional compensation for online course development (45 percent), consider teaching with technology (in-person or online) in tenure or promotion decisions (38 percent), or reward faculty members for contributions to digital pedagogy (35 percent agree, only 8 percent strongly).

Cybersecurity. As colleges and universities face growing numbers of cyberattacks, only 2 percent of CIOs say they are “extremely confident” that their institution’s policies can prevent such attacks, 20 percent are very confident, 59 percent are moderately confident and a full quarter are either “slightly” confident (23 percent) or not



confident at all (3 percent).

The vast majority of technology leaders say their institution has cybersecurity insurance, and nearly two-thirds of those (62 percent) say they are satisfied with their coverage. Nearly a third (29 percent) say they have insurance but want to expand it, and about 10 percent don’t have cyber insurance. Most of those say the policies are either too expensive or carry requirements that are too high.

Emerging technologies. Relatively few CIOs say their institutions have gotten serious about cutting-edge technologies. Fewer than one in seven technology administrators say their college or university has made “meaningful” investments in such areas as quantum computing (14 per-

cent), machine learning (6 percent), artificial intelligence (8 percent), adaptive learning (7 percent) or virtual reality/immersive learning (9 percent). Nearly a third of CTOs (29 percent) say their institution has “begun making investments” in virtual reality, more than in any of the others.

Public doctoral institutions are significantly likelier than their peers to have made investments in these areas.

Mobile accessibility. Only about a quarter of CTOs say their college makes it “extremely easy” for students to use a mobile device to perform core functions such as applying, buying a textbook, paying their tuition bill or changing a course. Another four in 10 on average say it is “somewhat easy” to do so. ■

ARTICLE HERE

<https://www.insidehighered.com/news/survey/campus-it-leaders-assess-digital-progress-data-use-remote-work>

How COVID Spurred Digital Innovation and Empathy

In the early pandemic, educators rallied to provide academic continuity in unprecedented ways. That spurred online teaching innovations, many of which are worth preserving and enhancing, a Stanford self-study says.

Susan D'Agostino · October 20, 2022

By most accounts, the March 2020 switch to emergency remote teaching and learning was rough on students, faculty members and staff workers. Student mental health suffered, existing inequities were exacerbated and many missed a sense of community.

Now, a Stanford University [self-study](#) released today provides evidence that, despite acknowledged hardships, college students, faculty members and staff rallied around the shared goal of academic continuity in unprecedented ways. In the process, they developed and refined online teaching practices and course design in ways that better serve the whole student. Moving forward, some of those digital innovations may be worth preserving and enhancing.

“It didn’t matter if you sat in IT or our academic technology group or in one of the schools or foreign facilities office where you rarely interacted with the academics—the shared goal was so clear to everybody,” said Matthew Rascoff, Stanford’s vice provost for digital education.

If colleges proceed without reflection, COVID-era digital teaching and learning improvements could be lost, the study authors argue. Their next step—scheduled to take place in the upcoming year—is to identify a new, unifying goal around which to rally. That goal, which is not yet



(Phynart Studio/Getty Images)

determined, will be whatever comes after the no-longer-needed goal of providing academic continuity during the switch to emergency remote teaching.

“That feeling [of a unifying goal] is going to go away if we don’t document it, develop some support to enhance it and say, ‘Don’t you want that back?’” Rascoff said. “We need that after the pandemic.”

The self-study, which was based on interviews

with 59 students and faculty and staff members and a review of early-pandemic artifacts, documents online education innovations and highlights lessons learned. The report also includes questions the community should ask now, “regardless of what turns the COVID-19 pandemic may take.”

Though the study focused only on one institution, other colleges may benefit either from understanding the lessons learned or by using it

to motivate their own self-studies, Rascoff said. What follows are some report highlights.

Enhanced Virtual Communities

When the pandemic hit, students' social connections, support networks and word-of-mouth communication channels were disrupted. Juniors and seniors, for example, had few opportunities to share knowledge with new students, according to the report. Students lacked opportunities to chat with professors in hallways or to participate in professional networking events.

"The pandemic was tragic, isolating and scary, but at the same time, it was a large-scale faculty boot camp" for digital teaching and learning, said Cindy Berhtram, a co-author of the study and associate director of project management at Stanford Digital Education, an office launched in 2021 that assists in coordinating the university's digital education efforts and incubates new programs.

Instructors were intentional as they worked to build and maintain connection in virtual spaces. To reproduce opportunities for informal chats, some arrived 15 minutes early and stayed 15 minutes late when hosting a Zoom class. Others planned brief, whole-class check-ins during class meetings in which they asked how students were feeling or what they were doing outside class.

Faculty members' Zoom backgrounds sometimes revealed children, pets or activity unrelated to the class that proved distracting at times. But those distractions also humanized instruc-



Faculty really need to be supported effectively to understand how to develop humanized online classes that foster belonging, identity, safety and trust.



tors, according to the study.

"The traditional [professor-student] relationship is one that's very much rooted in impersonal professionalism," said Michelle Pacansky-Brock, a faculty mentor for digital innovation with the California Community College system who is also the lead principal investigator on a project focused on humanizing online STEM classes. To humanize online learning, Pacansky-Brock notes, the professor-student relationship should "shift from one of impersonal professionalism toward relational authority."

When a student is uncertain whether they belong, their brain is scanning for cues such as a smiling face or warm gesture. An instructor who, for example, records a brief, if imperfect, welcome video in a nonoffice setting such as outdoors will signal an interest in connecting.

"Students will click on play and feel as if you're speaking one-on-one to them," Pacansky-Brock said.

Before the pandemic, Stanford's Center for Teaching and Learning hosted a little-used Teaching Commons website. The pandemic served as a catalyst for reviving the site, which provides curated digital resources in learning, education and pedagogy.

"It's not just that a website was created but rather cultural changes were happening at the institution," said Lisa Anderson, another co-author and associate director for educational partnerships at Stanford Digital Education.

The Teaching Commons website "became this growing ecosystem," Kenji Ikemoto, Stanford academic technology specialist, told the study's authors. "Stanford is decentralized, and the pandemic showed us that there's a lot of will to work together across department lines."

Inclusive, Collaborative Teaching and Course Design

The pandemic laid bare some long-standing higher ed and societal inequities. Some students struggled to access technology resources or internet connections necessary for remote learning. Zoom backgrounds also put students' homes on display; some joined class from quiet, spacious homes, while others joined from cramped closets or environments with many distractions.

Instructors developed mechanisms to better understand the whole student, including challeng-

es they faced in the virtual environment. Some, for example, invited students at the beginning of class to participate in a clickable world-map poll identifying where they were. That allowed students to bring a piece of their identities to class, while also letting the instructor know that, in some cases, they were joining from a location where it was nighttime.

“Belonging is a basic human need, and it comes before achieving one’s full potential,” Pacansky-Brock said. “That’s just as true in a physical classroom as it is online.” Higher ed administrators, according to her, need to recognize the need to foster belonging online, especially among underrepresented students.

“Faculty really need to be supported effectively to understand how to develop humanized online classes that foster belonging, identity, safety and trust,” Pacansky-Brock said.

Still other faculty members used surveys to solicit information on students’ technology needs, which provided real-time information necessary to create inclusive learning experiences. Many faculty members also invited students to periodic, virtual one-on-one meetings that helped build relationships.

Instructors also surveyed their students and adapted their remote courses in real time based on student feedback. Some asked students about their learning goals, which helped inform the course content. When they did, some stu-

dents reported having feelings of agency in the course.

“The absolutely biggest change is the way that instructors started paying closer attention to whether their courses are successful for students,” John Mitchell, Stanford engineering professor, told the authors. Mitchell noted that the habit may lead to permanent changes.

Staff across the university also formed partnerships to support inclusive online teaching. The Learning Technologies and Spaces team worked together with the Office of Digital Accessibility, for example, to develop a more comprehensive process for vetting and approving technologies for widespread use at the university.

By engaging with students in authentic ways during this time, faculty members were sometimes in the position of moderating difficult conversations. In response, individuals and groups across the university teamed up to produce resources and workshops offering guidance for navigating conversations about, for example, pandemic experiences or racial and social justice.

Lessons Learned and Unanswered Questions

In conducting a self-study, Stanford learned that previously fragmented schools, departments and business units had untapped potential to form partnerships that could enhance digital instruction and address educational disparities.

Faculty-student relationships also changed. Students offered tech support to instructors and participated in course design. Faculty members grew in their abilities to empathize with students’ individual challenges and, in response, adjusted their teaching and course designs to be more inclusive.

Some of the questions the researchers have moving forward are:

- “Under what circumstances should faculty and academic instructors be able to teach with flexibility, using such instructional modalities as fully online, hybrid or flipped instruction?”
- “Should students be afforded alternatives to attending classes in person and have more options of alternative forms of assessment?”
- “What should be students’ role in course design?”

The study is intended to serve as a foundation for crafting a mission-driven digital learning strategy in the upcoming year.

“Too often, faculty and leaders and the general public have this unfortunate view of online classes,” Pacansky-Brock said. “They look at them through a deficit-based lens and think, ‘Oh, it’s online, so it can’t be welcoming. It can’t be supportive. It can’t be rich in community.’ That’s very unfortunate, and it’s wrong.” ■

The Post-Pandemic College Campus as a Design Challenge

Imagining the college campus of the future.

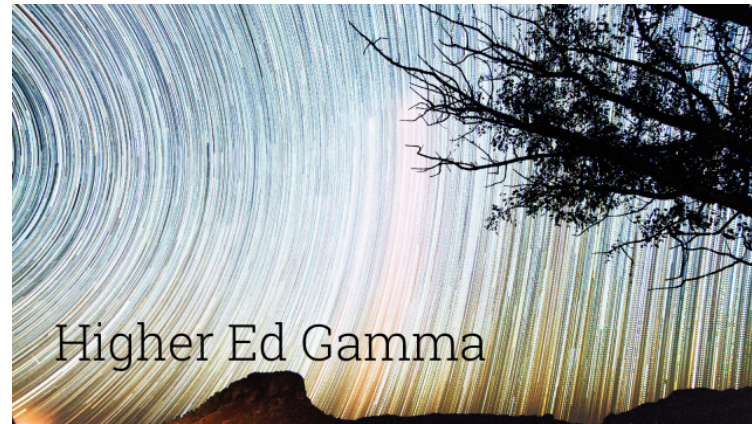
Steven Mintz · September 11, 2022

I don't know whether outer space is, as *Star Trek* tells us, the final frontier, but I know full well that physical space is among campus's biggest sources of conflict. Where we park, where we teach and whether we even have an office are among higher ed's most contentious issues.

On *Star Trek*, of course, the mission is visionary: to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no one has gone before. On campuses, the challenges are much more mundane but fraught financially and politically nonetheless. Decisions about building siting, architecture, layout, maintenance and remodeling rarely occur without controversy.

I recently had an opportunity to speak with Lori Pavese Mazor, who, for over two decades, has helped plan, manage and operate some of New York City's leading institutions, including the CUNY Hunter College, New York University, the Brooklyn Public Library system and New York–Presbyterian Hospital.

A Yale-trained architect with an NYU Stern M.B.A., Lori generously shared her thoughts about how post-pandemic colleges and universities might rethink some basic assumptions about space allocation and utilization in light of



current concerns over cost, eye appeal, fit, sustainability and especially the growing impact of remote work and remote learning.

Q: In our conversation, you called the campus a college's most valuable asset. I certainly understand that the campus symbolically represents a college or university. Its appearance is key to its brand. Everyone instantly recognizes a portrait not just of Harvard, Yale or Princeton, but any number of institutions. But you implied that the campus is also a valuable financial asset. Is that true?

A: If I look at some of New York's most prestigious academic institutions, Columbia, NYU and Barnard, a similar pattern is evident on the

balance sheet: real estate and the endowment are the two largest assets. Columbia University, which is considered to be one of the top three landowners in New York City, values its real estate assets north of \$6 billion, one-quarter of its total assets, which include a \$15 billion endowment. NYU's is the complete inverse, with \$15 billion real estate assets being twice as large as their \$7 billion endowment. At a smaller scale, Barnard's real estate assets and endowment are nearly equal. For unendowed publics like SUNY and CUNY, real estate is their primary asset.

Q: Wow, the value of a college's land and buildings really is remarkable. But aren't those assets sometimes a mixed blessing, given an

institution's remote location or the high cost of maintaining and remodeling buildings? I have read that some campuses are actually tearing down older buildings (like Missouri) or proposing to sell campus property (like Drew), while others, in contrast, are desperate to expand, like Yale and the University of Houston, which recently acquired business parks or, like UMass Amherst and Northeastern, have purchased existing campuses.

A: Revisiting the value of the physical campus will be a trending topic over the next decade. Beyond the four walls of urban campuses, all university systems will face a fifth wall posed by the rapid expansion of those digital technologies now labeled the metaverse. Early examples of this technology, which Meta (formerly Facebook) has funded for 10 pilot universities this coming fall, has led to a banal version of the digital campus of the future. These “digital twins” are uninspired simulations of the existing physical space in a virtual model. But these pilot efforts will soon be followed by more innovative developments in the metaverse.

Q: Just visit a medical school and you'll be amazed by how extensively these professional schools already make use of simulations, including virtual cadavers, hearts and brains, as well as surgery simulators—leaving those plastic toy human anatomy kits that children have played with in the dust.

A: Major breakthroughs will come with the full sensory haptic systems that are being developed in places like Carnegie Mellon make their

way into the teaching and learning environment. Moreover, the metaverse economy has the potential to reconsider the value of real estate in the absence of scarcity.

Q: I think it's fair to say that colleges and universities currently operate in an environment of space scarcity. At Columbia, there were only 100 general purpose classrooms. Even at my mega university, UT Austin, there were, as recently as 2014, just 259 general purpose classrooms.

We are now at a historical moment when many campuses have an opportunity to radically rethink their use of space. Space utilization lies at the very heart of many of the most vituperative campus battles. Every stakeholder wants more space—for dorms, research, parking, public-private partnerships and much more. But most urban institutions find it virtually impossible to increase their physical profile, for financial, political and community relations reasons. Even individual buildings can become battlegrounds—and not just over their names. Many campuses, including my own, have become mired in controversy over the fate of the institution's libraries, as microforms and even books and journals are moved to remote storage and replaced with cafés, study lounges, high-tech classrooms and, at UT Austin, a welcome center.

A: This leads me to imagine a virtual world with infinite space where a faculty member could be assigned an office with shelves of virtual books that could be called at a moment's notice, flipped and marked with what feels like a pencil or a highlighter, surrounded by a life-size whiteboard

for sketching out big ideas and everything is automatically transferred to a journal article that's been drafted using artificial intelligence for their review. Moreover, imagine the impact that virtual experience might have on the campus that exists in real life. Where would we hold office hours? Where would we hold meetings? Today's conversations are about two unequal worlds: a real world, which offers visceral three-dimensional experience, and an online world, which exists in a flat two-dimensional space. As those two worlds converge, which will happen in this decade, the choices facing campuses about what functions to locate on Earth and what to move to the Metaverse will be more nuanced.

Q: Campus design physically embodies an institution's brand and can impact, reflect and re-enforce a campus's culture. I can speak firsthand about how my sprawling campus's design has tended to balkanize faculty around departmental lines.

A: Physical space has proximity limitations that digital space does not, and we've already begun to experience relief from these limitations during the pandemic. As we quickly moved our operations remotely, I don't think any of us realized the long-lasting impacts this would have on the future of work. Zoom and Slack have allowed us to stay connected in a way that perhaps we would not have before. But even with these technologies, it's important to intentionally create a virtual space where diverse ideas come together. Otherwise, we simply end up recreating the silos and boundaries we have on earth in the virtual

realm. Some of the most innovative thinkers in the metaverse are Black and brown, female and nonbinary—people who come from disenfranchised populations and see the potential in the virtual world to chart a new course forward. We are all immigrants to this virtual world without the politics of occupation and territory.

Q: In addition to calling us to question the politics of territory, another consequence of the pandemic is to make campuses think much more seriously about their use of green space, which has rarely been deployed productively or creatively. Might it make sense to have more pavilions or even tents to shelter events?

A: As we reckon with the impacts of climate change, our outdoor spaces need to be capable of sheltering us in extreme temperatures and under inclement conditions. There is scientific evidence of the value of being in nature on our psyche and outdoor spaces will continue to be precious resources for academic communities. On the flip side, one of the virtues of a virtual world is that we can be made to feel a consistently comfortable body temperature. Rather than viewing climatized spaces as mediated by walls to contain tempered air and separate us from the outside, spaces might be categorized on a continuum of temperature from those that feel hot to those that feel cold. We might choose these different environments to suit our metabolic needs or personalize our climate.

Q: Among the biggest issues involving the physical plant relates to teaching. Outmoded facilities are overloaded with lecture halls and small

fixed-seat classrooms, plus a scattering of seminar rooms, and provide few spaces suitable for active or team-based or technology-enhanced learning. Lab space is inadequate to meet the growing for programs in biological sciences, neuroscience or engineering but can't easily be expanded because of cost constraints and safety regulations.

A: Large lecture halls and teaching laboratories have definitely been the limiting factors for being able to deliver innovative educational experiences at both the private and public institutions. During the pandemic it became easy to move a large lecture class online, and I think many institutions will keep this practice. There's very little value added by being in a room with over 300 people looking down on a lecturer and a slide projector. However, the laboratory experience will remain hybrid and rightly so. There are powerful virtual technologies that allow students to be in a lab and run experiments, and we have used these across the natural sciences. However, there's no alternative yet for the clinical experience. Even programs like nursing and physical therapy that have had long-standing simulation labs value the in-person experience of a classroom laboratory. No patient wants a nurse drawing their blood for the first time if they've never done it in real life.

Q: What is the best environment for teaching and learning? Probably not the multitiered auditorium nor the teacher-focused, fixed-desk classroom or even a seminar room.

A: I see the evolution of the classroom in the

same way as we've seen the evolution of the book. New books are now released in many different forms: hardcover, paperback, digital and audiobook. I still enjoy buying signed hardcover books and first editions. In the same way, I will always want to return back to the wood-paneled seminar room in Street Hall at Yale. At the same time, I've enrolled in Wharton's first business certificate program in the Economy of the Multiverse with 300 other students from around the world and am curious about that virtual experience. The challenge for institutions will be to rightsize the physical campus accordingly and to be smart about which modalities best meet the needs of their market.

Q: What principles should guide the development of campus spaces of the future?

A: The focus of the future will be on quality of delivery. Wherever a class is offered, whether on campus, online or in the metaverse, the space where it is delivered will need to be first-rate. Students will no longer have tolerance for poor-quality experiences and will easily be able to navigate from one to another as barriers to entry are dismantled.

Q: Also, can we use technology to facilitate field-based learning by using digital modalities to extend the physical classroom and breakdown classroom walls?

A: Our experience of space will be phygital—you could be in a real classroom on a physical campus studying archaeology and walk out a meta-physical door to a virtual dig site. The beauty of this experience is that you could visit that virtual

site at different periods of time. I would love to walk into a virtual New York City in the 1800s and stand on the corner of Fifth Avenue and 60th Street and watch a time-lapse construction of Central Park. This is now not only possible, it is probable.

Q: There's a danger, I think, that an increase in online courses will make students' relationship with the campus even more transactional than it already is. As fewer and fewer undergraduates conform to F. Scott Fitzgerald stereotypes, coming to college for frat parties, Greek life and intercollegiate sports, what should institutions do? How can the physical campus create a welcoming and supportive environment that will encourage students to feel a sense of belonging?

A: The pandemic taught us the importance of physicality to mental health, and I continue to believe in the residential college experience as a rite of passage into adulthood, above and beyond academic life. The undergraduate years are formative in establishing an independent identity from one's birth family and place of origin. Any next-generation campus planning should think of the residential space for students as the heart of the campus, not the periphery. When we think in this way, we naturally surround these students with the support services they need to thrive in a world where the pace of technological innovation is outpacing our social evolution.

Q: As you just made clear, post-pandemic, campuses will continue to matter. But we need to make sure that the experiences that the

campus offers are more meaningful and consequential than those that can be accessed virtually. In a highly contentious opinion piece in The New York Times, Nick Burns, the editor of American Quarterly, insisted that "Elite Universities Are Out of Touch. Blame the Campus." These campuses, he claimed, are too insular and inward turning, to which many comments responded: No, campuses are among this society's few oases of genuine diversity, which needs to be insulated, as much as possible, from outside meddling.

A: Universities have already taken and will continue to take greater steps to become resources to their home cities and regions. I grew up in a small town where the local pool, tennis courts and fitness center continue to be located on a college campus. The most controversial act of my preteen years was when the college converted the local movie theater into classrooms. I think they learned their lesson about town-gown relationships after that. University facilities have the capacity to serve both populations and creative campus planning maximizes the use of space for many different purposes throughout the day. In my vision for the future, the campus is a K-12 school, a center for lifelong learning, a community center and a resource for young and old.

Q: Very few have imagined a learning space that might bring together K-12, two-year, career and technical, and four-year education and museums into a more sweeping vision of a campus. As Ryan Craig recently observed,

success in the online certification programs offered by Amazon Web Services, Google and Microsoft, which are key to creating new avenues to upward socioeconomic mobility for the most disadvantaged students, hinges on ready access to wraparound support services. Unfortunately, all too many colleges and universities have been missing in action. Should other institutions follow Georgetown's example, which established its Capitol Applied Learning Lab to facilitate students taking D.C. internships? Or are there other models that make sense, like classes that include an internship with a local school or government agency or a nonprofit or for-profit? If institutions take these steps, what is the goal? To expand access and enrollment and facilitate experiential learning, or simply to tap new markets?

A: We are already starting to see the blurring of universities and for-profit technology companies in the education space. Apple, Amazon, Google, Microsoft and Meta are both the biggest threat and the greatest opportunity we have to create a continuum of academic and experiential learning with the support services that a residential academic community is poised to deliver. Universities are perfectly positioned to be both the imagineers of the future—developing the research, insights, foresights and applications of technology—and the implementers, using their own campuses as living laboratories to test and iterate these inventions. In addition, if we think of the metaverse as the next frontier, it will need thought leadership in governance, law, systems, finance and health. Any strategic forecaster of

the future knows that knowledge of the past and particularly a reckoning of our past mistakes, is the groundwork for imagining a better future.

Q: Does the isolated location-based campus still make sense, or should senior leadership consider other options? For example, should colleges follow the medical center model and distribute branch campuses, extension centers and adult learning facilities across a region? I myself argued on behalf of a distributed model of “storefront” or “boutique” campuses across the lower Rio Grande Valley, which held out the prospect of better serving a region with poor public transportation options by providing locally available face-to-face support. Or should institutions follow the example of those schools that have established mini campuses in major global cities, such as London, New York, Paris, Rome, San Francisco or Washington, D.C.? Or should they dream even bigger and, like Northeastern, disperse campuses across the nation and even the world?

A: As long as political boundaries continue to exist, it's important to go to where the students

are, and the American model of higher education continues to be attractive and needed around the globe. Wherever a physical campus is located, it needs to be walkable. The 20-minute walk serves as a simple organizing device. The pandemic amplified this idea, but it's one that city planners have used for decades to lay out well-planned cities with micro-communities. Within 20 minutes, one should be able to reach every basic service needed—from medical facilities to groceries. This is one of the great attractors of global cities like the ones you mention and what led me to settle in New York. This is the lifestyle that many people desire, but it's becoming less and less affordable.

In science fiction, the future almost invariably looks like an exaggerated version of pre-existing present-day trends and no doubt my imaginings of the campus of the future reflect my own predispositions:

That most students want a rich, robust campus experience, though not necessarily the kind that previous generations took for granted.

That students need a real reason to be on cam-

pus and accommodations, like drop-in childcare, to make that possible.

That it makes sense for students to spend less time on campus and more time in community-based learning experiences, whether these take the form of internships, field-based investigations or study abroad.

That while the future of higher education may well be hybrid and more experiential, students will continue to need the interaction, sense of community and wraparound support structures that are best offered in person.

Most science fiction versions of the future are dystopic, offering an interesting vision of the future but little resolution to our current problems. These we must solve ourselves. At the same time that Mark Zuckerberg and the meta-heads are imagining and creating the metaverse, those of us on earth need to re-engineer the physical environments that will complement the metasphere. Physical and virtual experiences should dance with one another and the college campus is the right place to start thinking, dreaming and experimenting. ■

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<https://www.insidehighered.com/blogs/higher-ed-gamma/post-pandemic-college-campus-design-challenge>

Breaking Free From Higher Ed's Iron Triangle

Yes, we can control costs, reduce performance gaps and improve learning outcomes without sacrificing quality or rigor.

Steven Mintz · January 18, 2023

Why hasn't technology reduced college costs, as many outside observers expected? As you probably know, in most instances, online courses cost the same or more than their on-campus equivalent.

Even though the fully online universities are somewhat cheaper than many of their brick-and-mortar counterparts, these institutions are not much cheaper. From the student perspective, online colleges' cost savings result mainly from faster time to degree thanks to generous policies for awarding credit for prior learning, not from lower up-front tuition.

The inability to significantly trim costs in higher education stands in stark contrast to the impact of technology on other industries, including publishing. The advent of new digital technologies radically reduced typesetting costs while making it much easier to outsource copyediting and shift printing overseas. At the same time, digital books produced an alternate distribution channel without imposing any additional printing costs. Some of the more entrepreneurial academic publishers also discovered that scholarly journals and databases could generate significant revenue.

The standard explanation for higher ed's failure to take advantage of technology's cost-saving



(Eleganza/Getty Images)

potential is straightforward: technology did not reduce labor costs, whether for teaching or service provision, nor did it significantly reduce the need for physical plant. Indeed, technology represented an added expense as colleges and universities instituted new, costly platforms to manage finances, information flows, record-keeping, HR, admissions and stakeholder relationships.

Rather than cutting costs, the pandemic-driven shift to remote service provision simply redistributed where work is performed and how services are accessed. It didn't reduce labor costs or increase productivity. Whatever advantages

ensued flowed to employees, by reducing time spent commuting to and from campus.

In theory, campuses might use technology to outsource various functions. To a very limited extent, for example, in terms of mental health support, this has occurred. But apart from on-line program management, I haven't seen much outsourcing—even in areas where campus services, like advising, tutoring and career counseling, are grossly inadequate.

Could technology increase productivity or trim costs—or is that largely impossible due to Baumol's cost disease: the fact that higher education is inherently labor-intensive?

In fact, technology does hold out the prospect of reducing costs while improving quality if—and this, of course, is a big if—colleges and universities are willing to rethink their practices.

Let me stress: I have no interest in replacing large lectures with MOOCs or offering standardized “master” classes taught by nonfaculty or putting more students into asynchronous “self-paced, self-directed” courses. These strategies will inevitably compromise quality.

So what, then, can be done?

1. Large in-person lecture classes with low levels of student-faculty interaction could be supplemented or replaced with higher-quality synchronous, scaled online classes. Synchronous, scaled online classes can be more rigorous, more engaging and more interactive than their in-person counterparts. The key, of course, is not to imitate, in an online format, a standard in-person lecture, but to radically reimagine the learning experience.

Divide the online experience into a series of shorter segments that intersperse brief lectures with interviews with guest experts; discussions or debates among a panel of experts; surveys, polls and questionnaires; videos and animations; and problem-solving activities, accompanied by small breakout sections and chat rooms (typically consisting of five to seven students led by a rotating leaders or moderators and accompanied by team, peer and self-evaluations to assess each team's dynamics and performance).

Such an approach obviously requires a team of



The key, of course, is not to imitate, in an online format, a standard in-person lecture, but to radically reimagine the learning experience.



assistants (who might be advanced undergraduates) to answer questions and support staff to address technical problems. But because such classes can teach upwards of 1,500 students at a time, they are no more expensive than existing in-person lecture classes and free up other faculty to direct high-impact practices such as mentored research.

2. Technology can increase students' access to the active learning pedagogies associated with deep, durable learning. Students learn more, retain more, become more skilled and develop greater conceptual understanding when they actively process information and apply knowledge, concepts and skills to authentic problems. We now have a host of technology tools that make it easy for students to collaboratively annotate assigned readings, map and visualize data, mine

texts and create infographics, podcasts, video stories and virtual exhibits and contribute to a class website or virtual encyclopedia.

3. Technology can enhance learning support. Repeat quizzing can help students (and their instructors) identify areas of confusion and underdeveloped skills. To address gaps in understanding or mastery, technology can prompt students to make use of embedded tutorials and facilitate synchronous and asynchronous online study groups and provide ready access to learning support centers.

4. Technology can scale high-impact educational practices. Many of the high-impact practices that enhance student engagement, improve retention, deepen learning and better prepare students for postgraduation success can be taken to scale with technology. For example:

- In an intensive writing course, students might critically evaluate text generated by ChatGPT or revise AI-generated text. Undergraduates might also receive instruction into effective peer writing feedback and then evaluate each other's writing assignments.
- Technology can expand access to research opportunities that can be conducted virtually. These might include opportunities to collect and analyze data sets, conduct literature reviews, create annotated bibliographies, engage in data management and visualization, and design experiments or programs. Humanities research is also possible. Students might analyze online archival resources; transcribe, digitize and annotate primary sources;

and create or contribute to virtual exhibitions or online encyclopedias.

- New technologies also provide a mechanism for providing students with career-aligned skills training. This might involve training in investigative and analytical techniques, programming languages, and industry-aligned digital platforms.
- Community service can be scaled electronically. Undergraduates might serve remotely as mentors or tutors for K-12 students, translate for refugees or other immigrants, staff an antiviolence or suicide-prevention hotline, communicate with isolated seniors, and record or translate public-domain books. Student teams can conduct research for community organizations and devise solutions to community problems.
- To promote global learning, technology can facilitate paired international partner classrooms and virtual pen pals.

5. The more popular campuses could significantly expand the number of students served.

Even relatively modest increases in online course offerings, study abroad and other forms of online or off-campus learning could reduce pressure on existing classroom space and allow campuses to serve more students without any commensurate increases in facilities.

Since instruction represents only about 20 percent of campus costs, and since real faculty

salaries have increased only modestly since 1999, productivity increases are possible without altering the student-faculty ratio or diminishing educational quality.

In a 2021 posting, the economics blogger Noah Smith quotes a famous 1987 quip by the Nobel Prize-winning MIT economist Robert Solow: "You can see the computer age everywhere but in the productivity statistics." That's proven especially true in higher education.

Contrary to what many think, there is no inherent conflict between quality, rigor and learning, on one side, and cost, efficiency, productivity and scale, on the other. If we've haven't broken higher education's iron triangle of access and affordability, attainment, and quality, it's for two primary reasons. First, because we've refused to think outside the box, and second, because we've allowed other priorities to take precedence over our core mission of teaching and learning.

Shifting to a more learning- and learner-centered educational model will inevitably disrupt the lives of the full-time tenured faculty members who are most comfortable with college as it currently is. The innovations that I call for will require many faculty members to redesign their existing courses and develop new kinds of learning experiences that are more active and experiential. They will also need to think of themselves in a new light, as learning architects, teach in unfamiliar ways and provide more substantive,

constructive feedback. Skills building—especially of writing and quantitative skills—must become a higher faculty priority and not relegated largely to adjuncts and TAs.

In the vision that I favor, faculty will also have to assume greater responsibility for mentoring, not just of graduate students, but undergraduates as well.

Why rock the boat? Because higher education must do several things simultaneously: control costs. Improve learning outcomes. Reduce equity gaps. And bring more students to academic and career success.

Innovation is imperative, because higher education isn't just about us, our convenience and our professional ambitions. It's ultimately about our students. Without technology-enabled improvements, costs will continue to rise unsustainably, and the kind of education that is best will ultimately become unmaintainable and unaffordable.

Embracing new technologies, innovative pedagogies and novel kinds of learning experiences isn't about cheapening a college education. Just the opposite. It's a way to ensure that undergraduates receive the kind of education that we now reserved for the most privileged students, an education that is immersive, participatory, personalized, experiential and well mentored. We can do it if we try. ■

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<https://www.insidehighered.com/blogs/higher-ed-gamma/breaking-free-higher-ed%E2%80%99s-iron-triangle>



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