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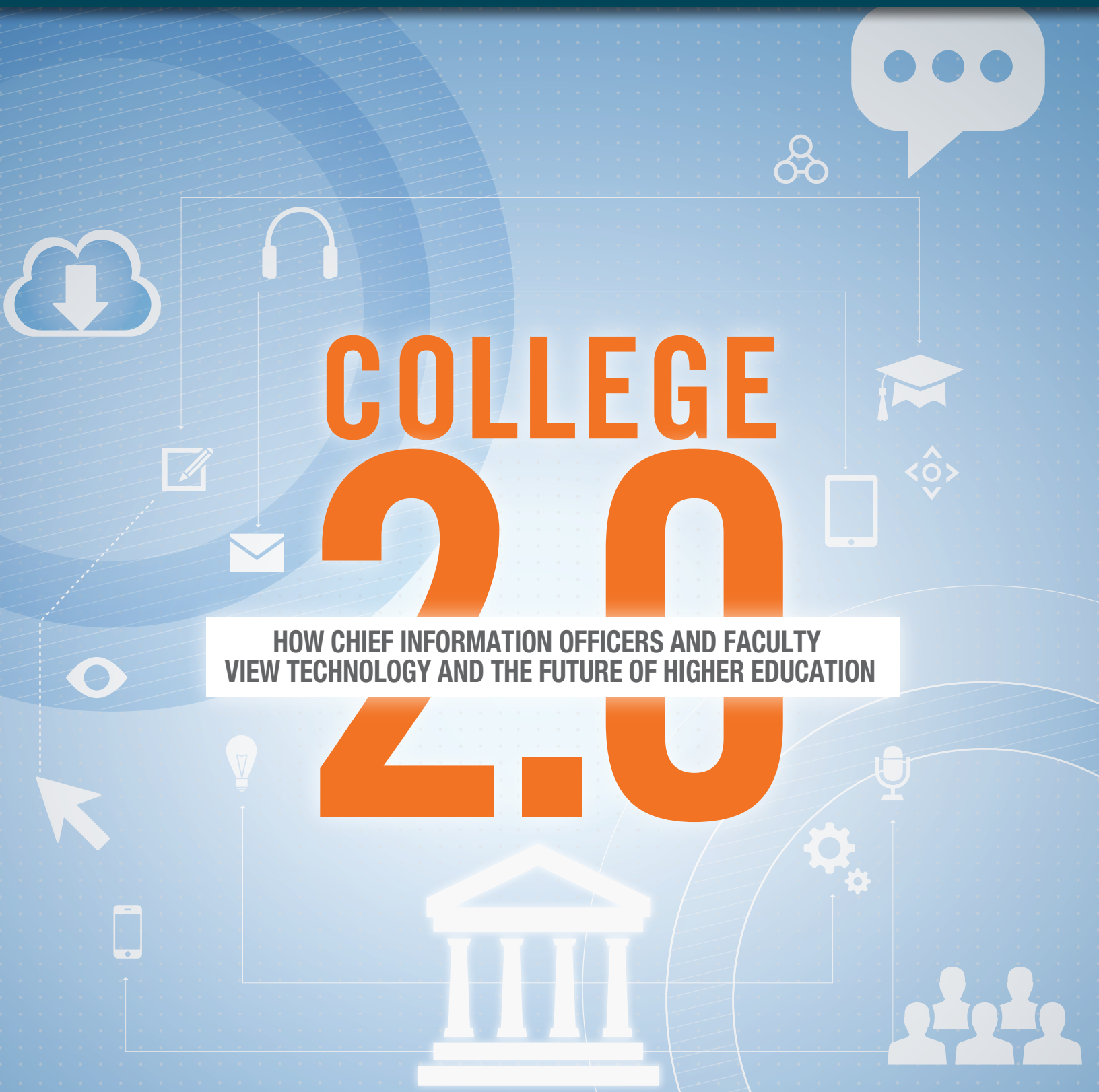

COLLEGE 2.0

HOW CHIEF INFORMATION OFFICERS AND FACULTY VIEW TECHNOLOGY AND THE FUTURE OF HIGHER EDUCATION

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College 2.0: How Chief Information Officers and Faculty View Technology and the Future of Higher Education is based on a survey conducted by Huron Consulting Group, Inc., was written by Jeffrey J. Selingo, contributing editor at The Chronicle of Higher Education, Inc. and is sponsored by Dell. The Chronicle is fully responsible for the report's editorial content.

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EXECUTIVE SUMMARY

Higher education institutions have long been under pressure to be on the cutting edge of technology. From the time the personal computer became a mainstay in the early 1980s, through the beginning of the Internet Age of the late 1990s, to today's mobile revolution, students and faculty have come to expect the latest resources for learning and teaching. Technology has become necessary in every corner of campus.

Such demands, of course, have come with enormous price tags. While most sectors of the economy have enjoyed substantial cost savings over the past several decades by using technology to fundamentally transform how they do business, colleges and universities remain largely unchanged in the way they deliver education. Instead of cutting costs, the pressure to have everything from the fastest wireless network to smart classrooms with the capability to record every lecture, has added to the expenses of institutional budgets and the number of people needed to support technology in higher education.

Until now.

The promise of technology to improve learning and lower costs finally seems closer to a reality. Cloud computing has reduced the cost of storage and made access to information anywhere, on any device, easier than ever before. Mobile technology has eased the sharing of technology resources across campuses. And the advent of "Big Data" has assisted college leaders and students alike in making better decisions, from where to spend limited resources to what courses to take.

But the proliferation of technology on campuses and the talk of disruption to higher education have resulted in tension between those who jump on the latest "game-changing" advances and those who are skeptical that technology can replace what has for centuries been a people-driven enterprise. Even within the faculty ranks there are divided opinions about the proper use of technology in teaching.

An extensive survey of chief information officers (CIOs) and faculty members, conducted by The Chronicle of Higher Education in the summer of 2014, found that the two groups often differ in their views in how various technological solutions should be applied at colleges and universities. The survey, completed by more than 1,000 technology officers and faculty members focused on their attitudes about the performance and expectations of information technology, the centralization of technology functions on campuses, the potential impact of advances in digital teaching and learning, and the future of higher education. Among the highlights from the survey:

EFFICACY OF TECHNOLOGY. Some 75 percent of technology officials said that digital resources were well deployed on their campuses, compared to more than 50 percent of faculty members. Only 41 percent of professors said the technology needs of academic departments were understood and addressed by the central IT department.

HYBRID AND ONLINE COURSES. CIOs say that a majority of students on campus will be taking online and hybrid courses in a decade. Whether those courses are of better quality than face-to-face classes remains a question, however. Nearly 75 percent of CIOs said that the value of a hybrid course was better than a course taken in person; only 39 percent of faculty agreed with that opinion. But CIOs and faculty were largely in agreement that online courses don't come close to the quality of face-to-face courses.

BIG DATA. Although few campuses in the survey use Big Data to improve student success, some six in 10 CIOs say that it has the potential to improve student outcomes, compared to just three in 10 faculty members.

DISRUPTIVE CHANGE. Most CIOs and faculty members say their campuses need a moderate amount of change in the next decade to adapt to technology. Only one-quarter say that significant change is needed.

CLOUD-BASED TECHNOLOGY. The technology officers predicted that more than 50 percent of systems on their campuses would be in the cloud within five years.

MOBILE COMPUTING. More than half of CIOs said that mobile tablets would play a significant role in defining their technology needs in the future, although only one-third of them said they had a coherent mobile strategy. One quarter of technology officers said the trend toward students bringing their own devices to campus was straining their networks beyond capacity.

INTRODUCTION

For much of the past three decades, the use of technology on campuses has been seen as something of a sideshow as faculty members went about delivering lectures, advising students, and conducting research. But in recent years, technology has begun to intrude more into the jobs of professors, as students consume more course content online.

The tension over the role of technology in higher education came to a breaking point in 2013, in the heart of Silicon Valley. A year earlier, four professors at San Jose State University had traveled to Cambridge, Massachusetts, to see how edX, one of the major providers of Massive Open Online Courses (known as MOOCs), could help them remake their circuits course, which had a low rate of students passing.

The result was a new way of teaching class for some professors. San Jose students would watch edX lecture videos at home and attend face-to-face classes twice a week with a San Jose professor to practice what they had learned and ask questions. By the midterm, professors teaching the edX version knew they were on to something. Grades in that section were significantly higher than in traditional classes. Nine in 10 students ended up passing the MOOC-powered course. The pass rate in the traditional courses was just 50 percent.

Those numbers caught the attention of San Jose State University's president, Mohammad Qayoumi. If this approach worked in engineering, why couldn't it work in philosophy, political science, or physics? Could he save money and improve results if he outsourced the teaching function to the best universities and then hired faculty as coaches?

In the subsequent months, San Jose State's administrators partnered with another MOOC provider, Udacity, to run several courses on campus and urged the philosophy department to adopt an edX class into its curriculum.

Neither experiment worked out as administrators had hoped. Philosophy professors responded by publishing an open letter that garnered national media attention, criticizing the notion of "one-size-fits-all vendor-designed" courses and refused to incorporate the edX class into their courses. Meanwhile, the three Udacity courses had pass rates between 24 and 51 percent, much lower than those of their traditional face-to-face classroom counterparts.

The conflicting results and uproar over the courses caused San Jose administrators to halt the experiment with Udacity for a semester. Critics of the overuse of digital resources in the classroom claimed a victory, even as administrative leaders on campuses nationwide continued to face decisions about the role technology should play in teaching a new generation of students.

This brief attempts to inform planning for college executives and faculty alike. It is based on two surveys: one of campus technology officers, and a second of faculty members. Both surveys explore attitudes about technology and its impact on the future of higher education.

Technology on Campus: Who Is In Charge?

Technology is often seen as a hindrance by most on campus, except the people in charge of it: the chief information officers.

Like any large company, universities have legacy software systems spread across campus, which manage everything from payroll to paying invoices. These extensive databases have grown up over time in fits and starts.

On many campuses, individual departments and colleges are mostly autonomous, so they built their own bureaucratic structures through the years to support their operations. On top of that infrastructure, add the organization of the central administration, and you can see how redundancies happened in both people and technology.

As a result, technology is often seen as a hindrance by most on campus, except the people in charge of it: the chief information officers. In the survey, 75 percent of technology officials said that digital resources were well deployed on their campuses, compared to just more than 50 percent of faculty members. Technology officers were also more sympathetic than faculty to student needs when it came to the gadgets students bring to campus and to the idea that technology can cut costs in higher education (see Figure 1).

Chief information officers at private colleges were more likely than their counterparts at public institutions to believe that students have unreasonable expectations for the use of technology on campus. Meanwhile, faculty members at two-year institutions were less likely than their four-year peers to find technology to be well deployed; only four in 10 agreed that it was, while eight in 10 chief information officers at community colleges did (see Figure 2).

FIGURE 1

CIO and faculty attitudes on effective use of technology on campus and how it aligns with public and student expectations.

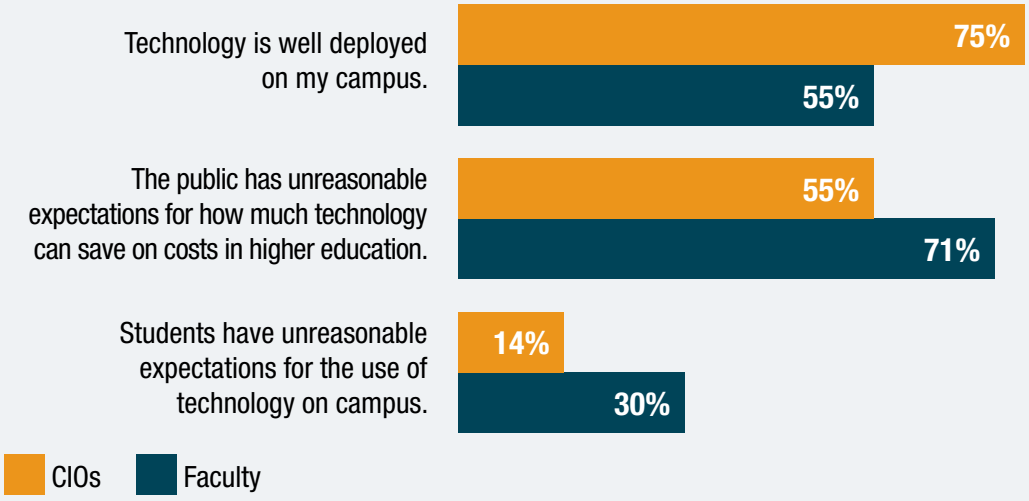
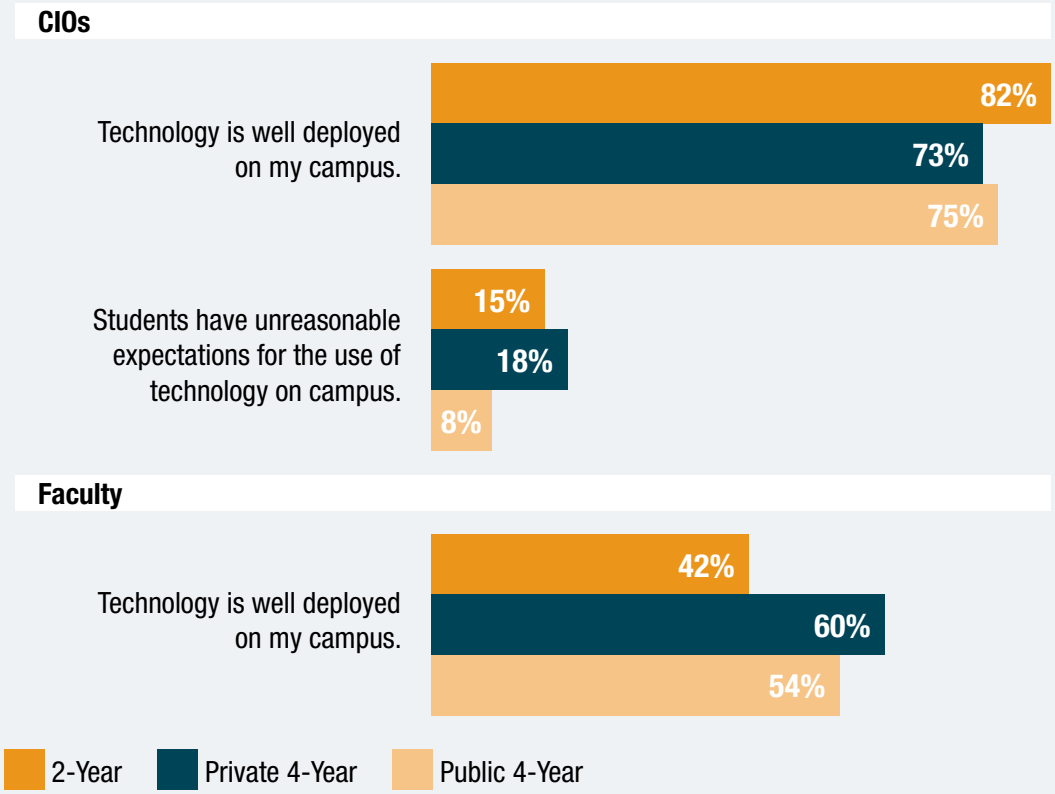


FIGURE 2

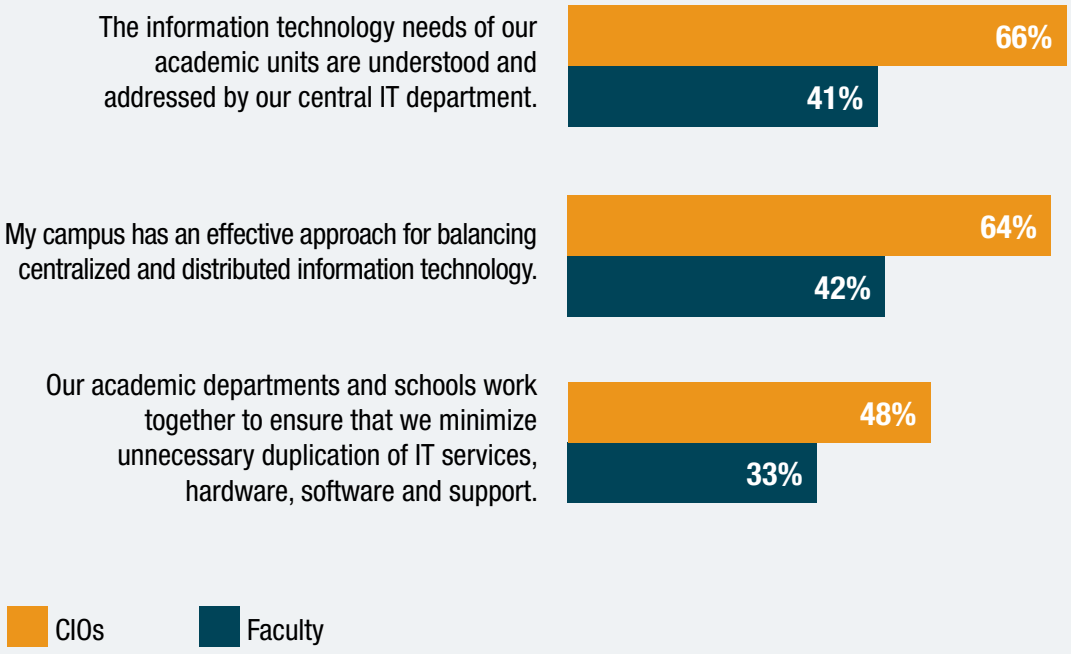
CIO and faculty attitudes on effective use of technology on campus and how it aligns with public and student expectations, by institution type.



Complexity breeds redundancy because as a university grows, each new entity develops its own support structure. Information technology is a clear example of this redundancy. Many campuses run multiple e-mail platforms and computer servers, spread throughout the campus, because every school or department decides they need their own storage solutions.

According to The Chronicle survey, these redundancies exist in part because of a level of mistrust between chief technology officers and faculty members. When asked in the survey whether the technology needs of academic

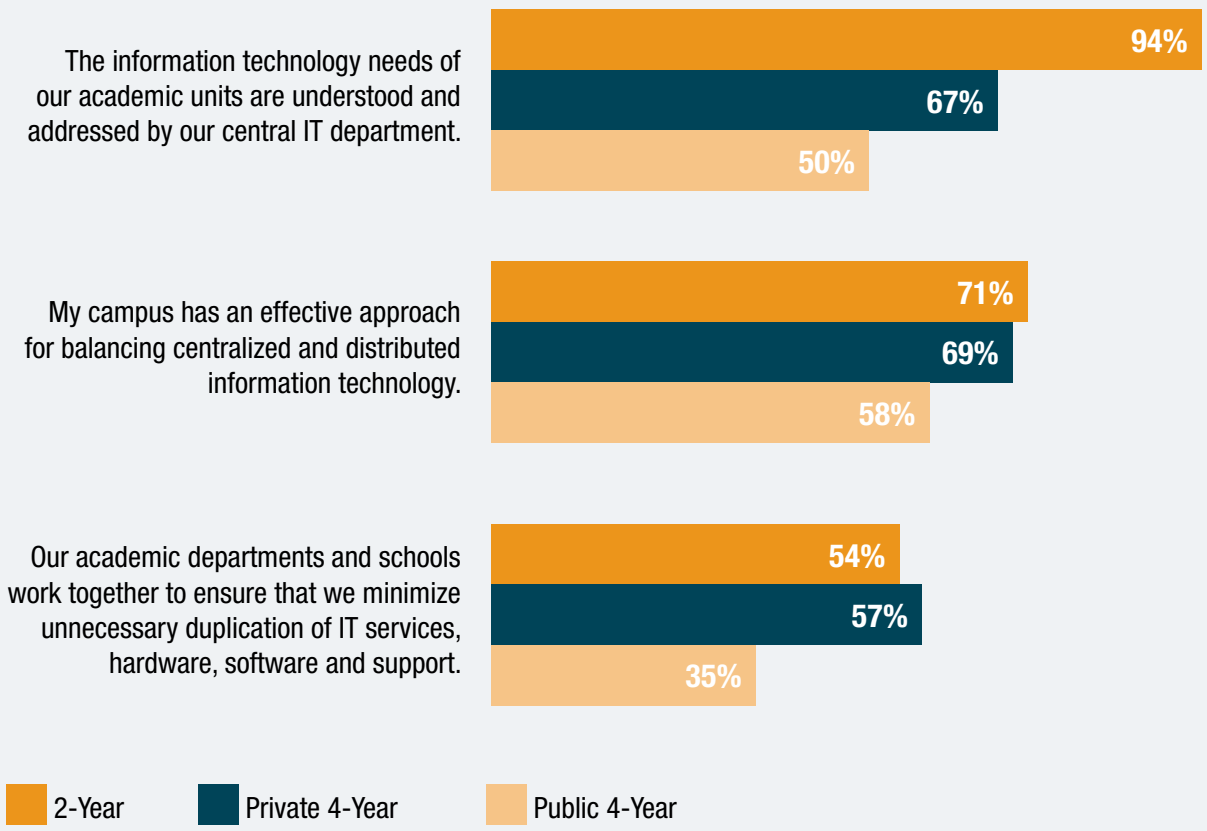
FIGURE 3
CIO and faculty attitudes on how well technology is serving the institution.



departments were understood and addressed by the central IT department, only 41 percent of professors agreed, compared to 66 percent of CIOs.

There was a similar divide between the two groups on whether the campus' approach to technology was effective and if different departments and schools worked together to minimize unnecessary duplication (see Figure 3). CIOs at public institutions were most worried about whether their IT departments were meeting the needs of the academic units (see Figure 4).

FIGURE 4
CIOs attitudes on how well technology is serving the institution, by institution type.



Technology on Campus: Teaching and Learning

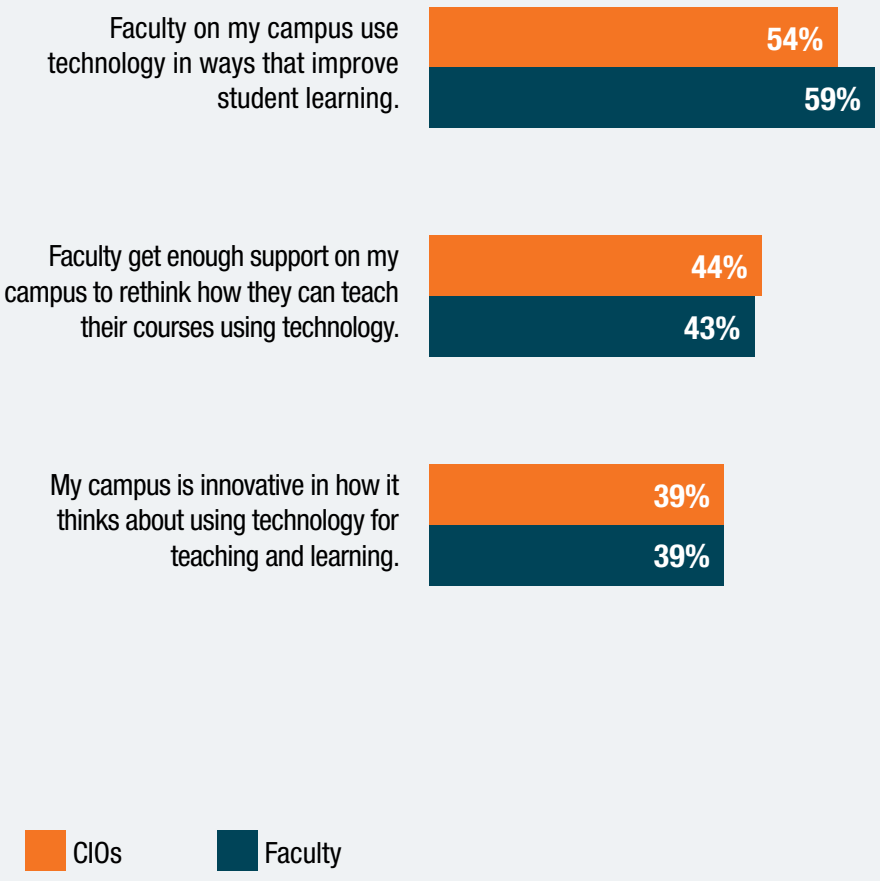
Just four in 10 professors and chief technology officers say their campuses are innovative in how they think about using technology for teaching and learning.

In 2011, a few professors in the computer-science department at Stanford University opened their courses for the world to take for free, and hundreds of thousands of students signed up, launching the modern MOOC (Massive Open Online Courses) movement. Hundreds of free online courses from dozens of the nation's most elite universities followed.

The modern university is now a mix of the analog and the digital world. Students and faculty members expect that everything from courses to books be delivered digitally so they can access information anywhere, anytime, on devices and applications they use every day. Today's students, the so-called "digital-natives," also want the ability to integrate their smart phones, tablets, and laptop computers.

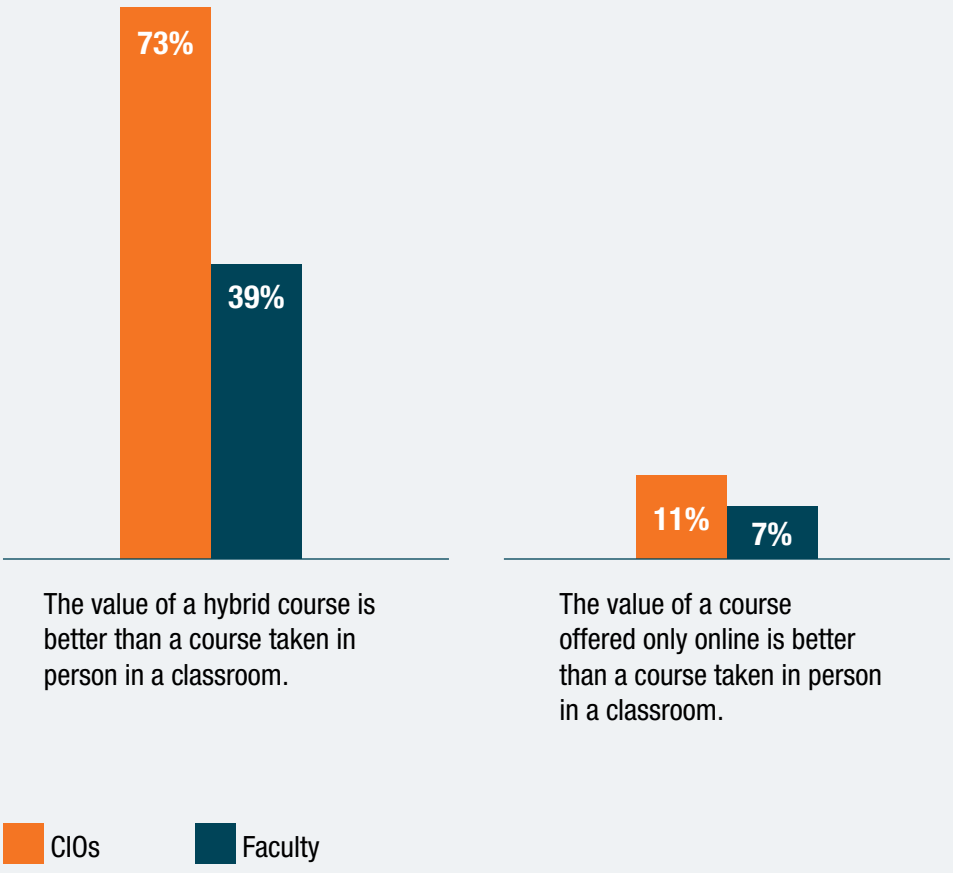
But when it comes to teaching and learning with technology, both faculty members and CIOs say that students are getting shortchanged. Just four in 10 professors and chief technology officers say their campuses are innovative in how they think about using technology for teaching and learning. What's more, less than half of both groups say that faculty members get enough support to rethink how they can teach their courses using technology (see Figure 5).

FIGURE 5
CIO and faculty attitudes on support for redesigning courses in the digital age.



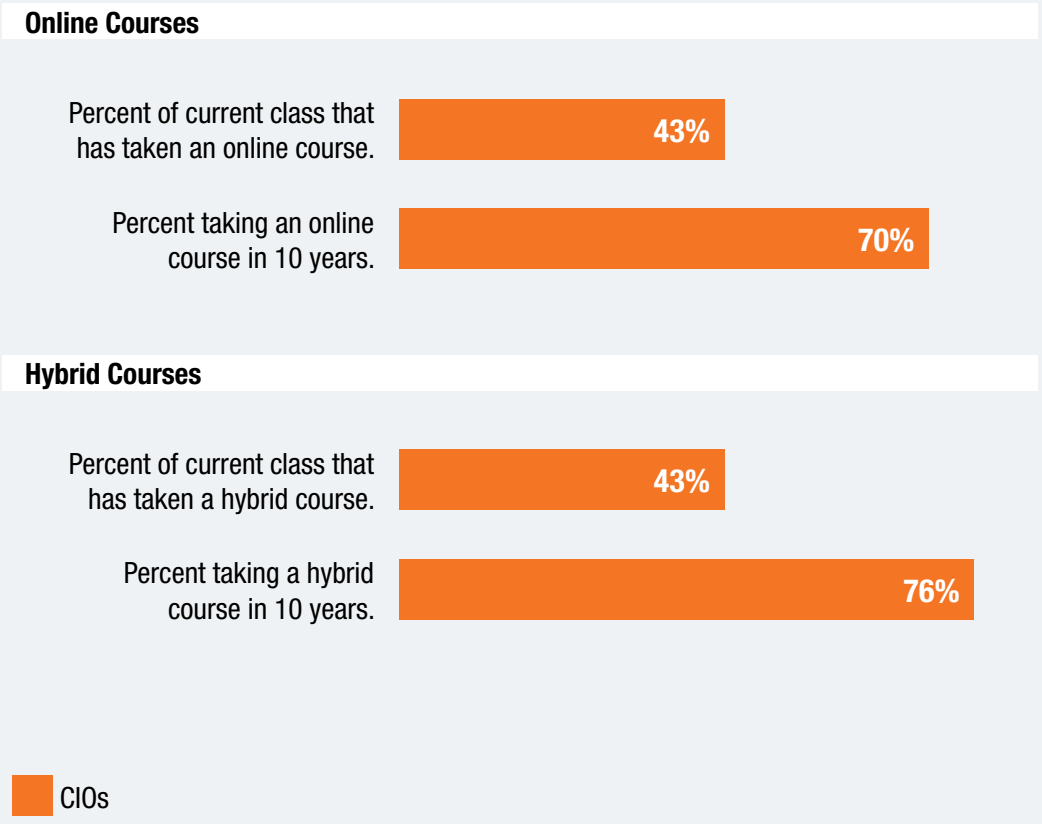
Recent research reports have praised hybrid courses, which have both face-to-face and online components, as potentially saving money and time while having student outcomes similar to traditional classes. Even so, faculty members remain skeptical. According to the survey, nearly 75 percent of CIOs said that the value of a hybrid course was better than that of a course taken in person; only 39 percent of faculty agreed with that opinion. But CIOs and faculty were in agreement on their assessment of online-only courses compared to face-to-face courses: the two don't compare. Only about 10 percent of faculty and CIOs said the value of an online class is better than that of a classroom course (see Figure 6).

FIGURE 6
CIO and faculty attitudes on hybrid and online learning.



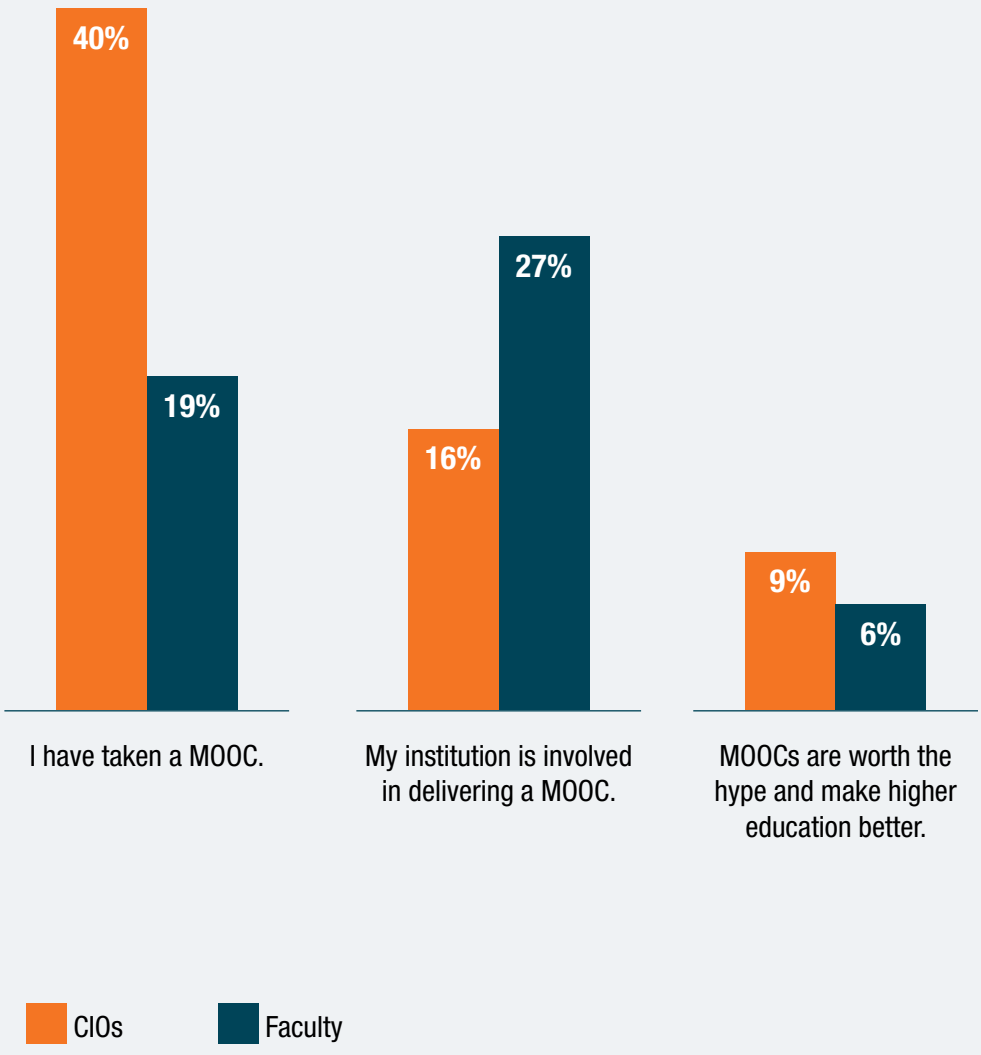
Looking into the future, CIOs say that, unlike today, a majority of students on campus will be taking both online and hybrid courses. According to the survey of chief technology officers, fewer than half of their students today take an online or hybrid course. But CIOs said some three quarters of their students would be enrolled in a online or hybrid class in 10 years (see Figure 7).

FIGURE 7
CIO predictions on the use of hybrid and online courses in the next decade.



Among the innovations being discussed right now, CIOs and faculty are most negative about MOOCs, although less than half of the technology officers had taken one, and even fewer faculty members have (see Figure 8).

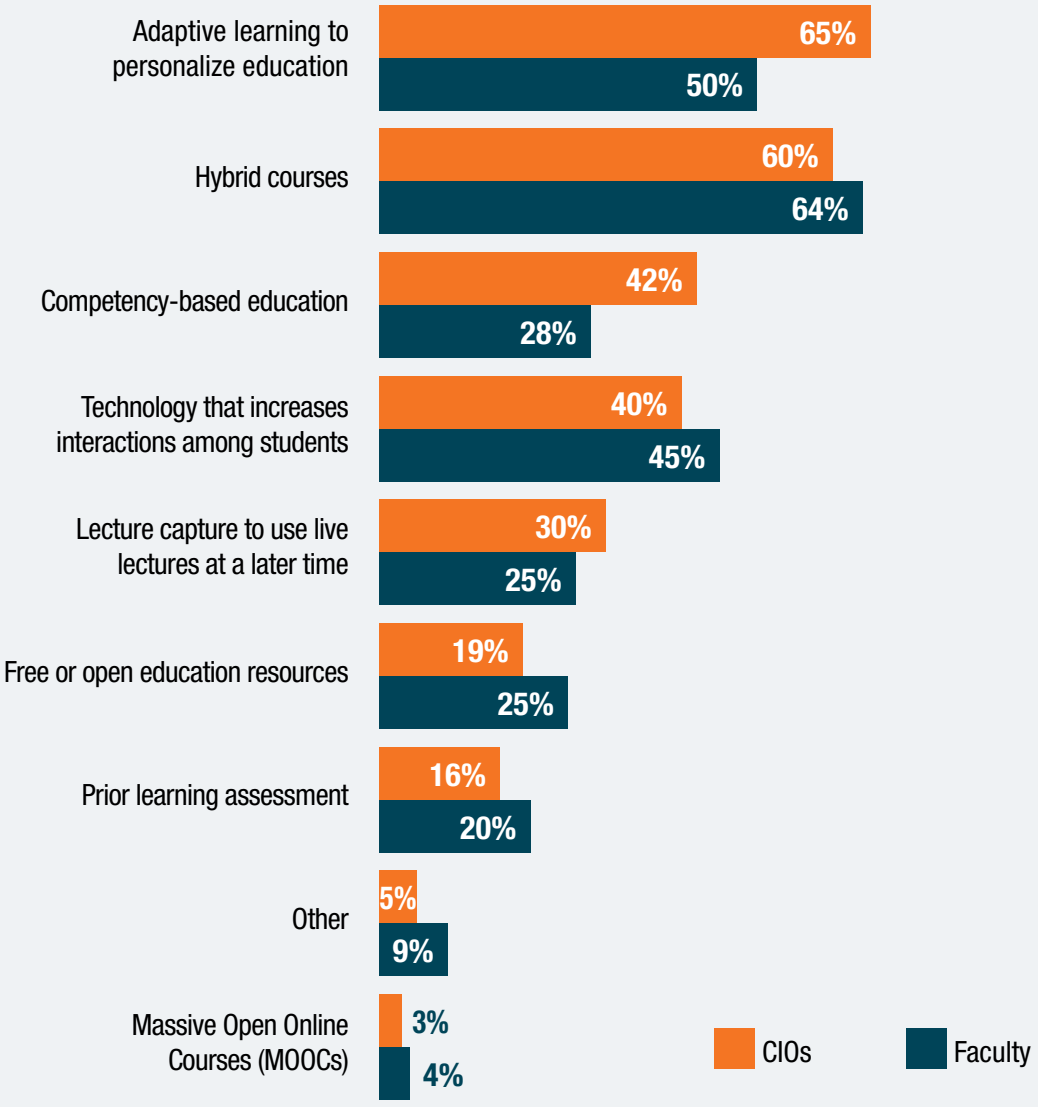
FIGURE 8
CIOs and faculty experience with MOOCs.



Technology officers were most confident about the potential impact of adaptive learning technologies to personalize education, using tools much like those that suggest books to buy on Amazon or movies to rent on Netflix. Faculty members, despite their skepticism of hybrid courses, were most positive about their future impact on higher education, compared to other innovations being discussed on their campuses (see Figure 9).

FIGURE 9

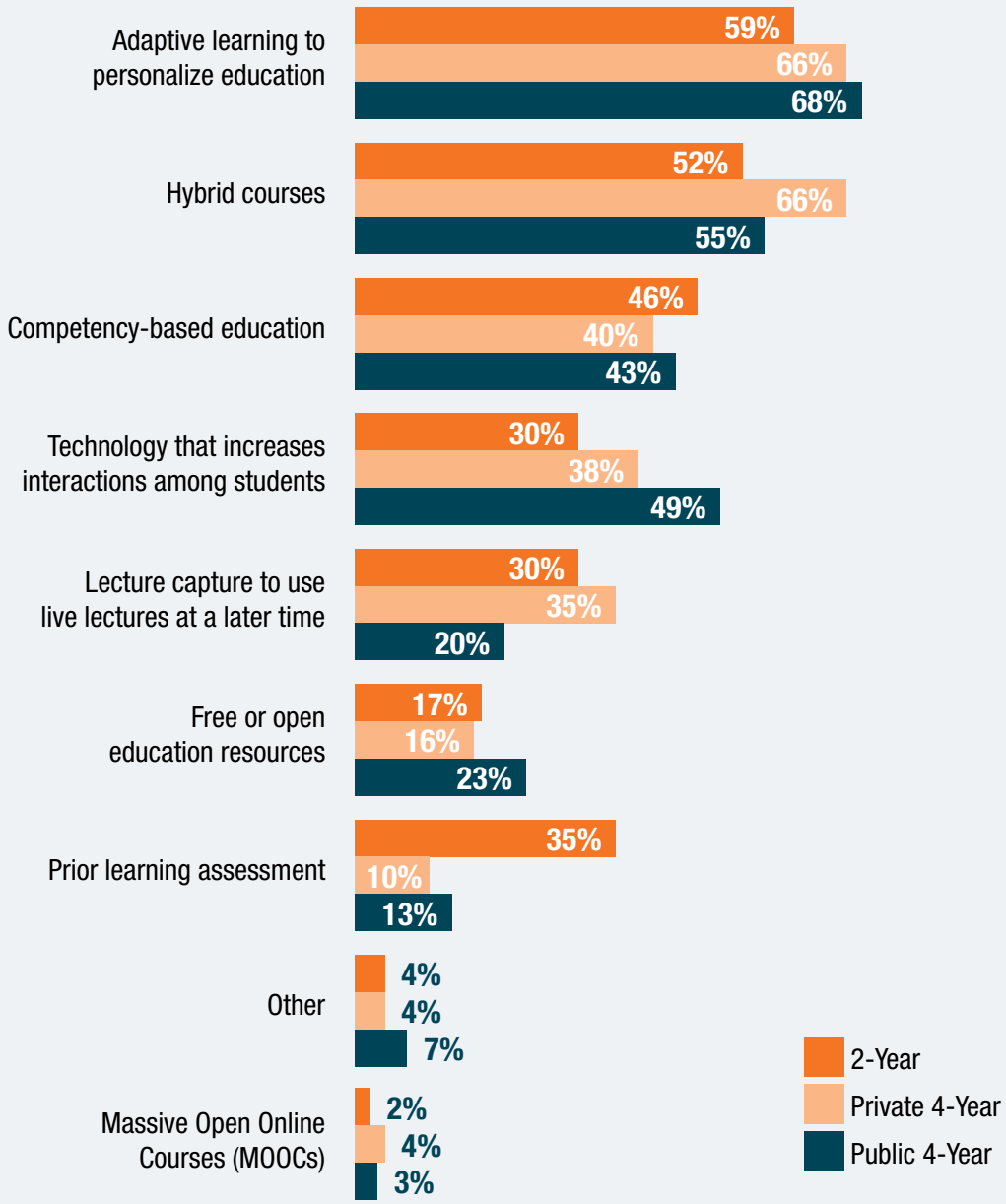
CIO and faculty attitudes on innovations that will have the most positive impact on American higher education in the future.



What CIOs thought about specific innovations depended largely on where they work, according to the survey. Compared to their counterparts in other higher-education sectors, technology officers at two-year colleges, for instance, were much more positive about prior learning assessment, which gives students course credits for expertise they have gained outside the classroom (see Figure 10).

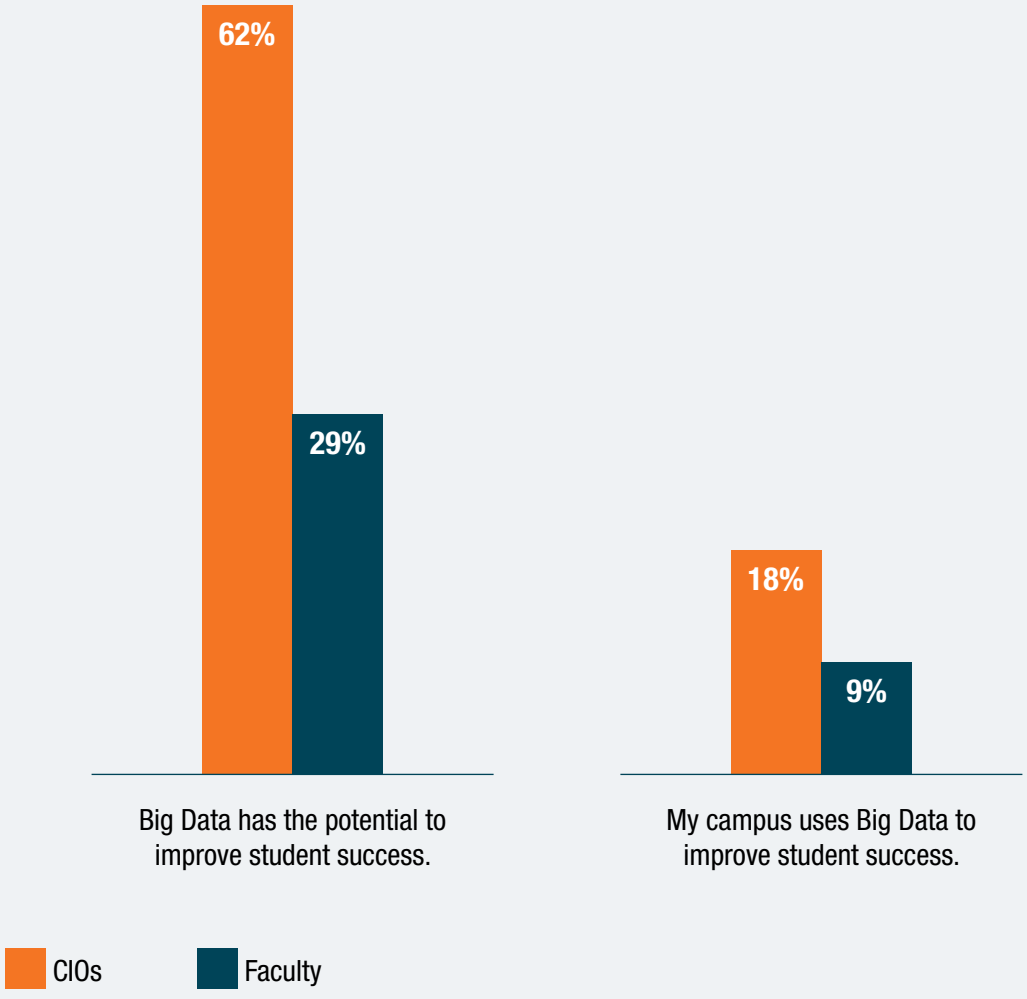
FIGURE 10

CIOs attitudes on innovations that will have the most impact on American higher education, by institution type.



The modern data flood is a powerful tool to improve decision making, from whether a doctor should order an expensive medical test for a sick patient to how much insurance companies should charge for coverage in hurricane zones. But until recently, data science was largely absent from the high-stakes decisions made in higher education. That is changing as more institutions use data to help students choose majors or pick classes. Although few campuses in the survey use Big Data to improve student success, some six in 10 CIOs say that it has the potential to improve student outcomes, compared to just three in 10 faculty members (see Figure 11).

FIGURE 11
CIO and faculty attitudes on Big Data.



Technology on Campus: The Future

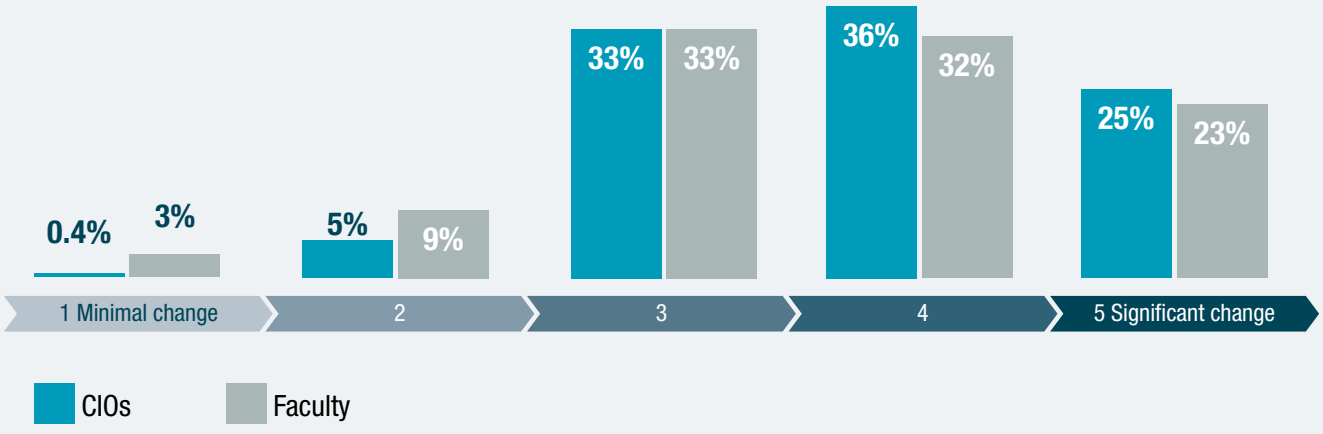
The majority of CIOs and faculty members are in widespread agreement that only moderate changes are needed in the next decade to adapt to technology.

The demise of the residential college is often predicted. For example, Clayton M. Christensen, a Harvard Business School professor and champion of disruptive innovation, suggested in a New York Times essay in November 2013 that the "bottom 25 percent of every tier" of colleges will disappear or merge in the next 10 to 15 years.

A few weeks earlier, speaking at a conference in Washington, D.C., Andrew S. Rosen, chairman and chief executive of Kaplan Inc., predicted that only 600 traditional colleges would survive the next few decades. Rosen said that in the future, students won't need "a physical presence for four years" in order to acquire a college degree. "Over time," he said, "the market has to realign itself to what's needed, and presence is not the essential piece."

Higher education is frequently criticized for its slow pace of change, and that pace doesn't seem about to radically change. Despite their differences in many parts of The Chronicle survey, the majority of CIOs and faculty members are in widespread agreement that only moderate changes are needed in the next decade to adapt to technology. Just a quarter of them think that significant change is needed (see Figure 12).

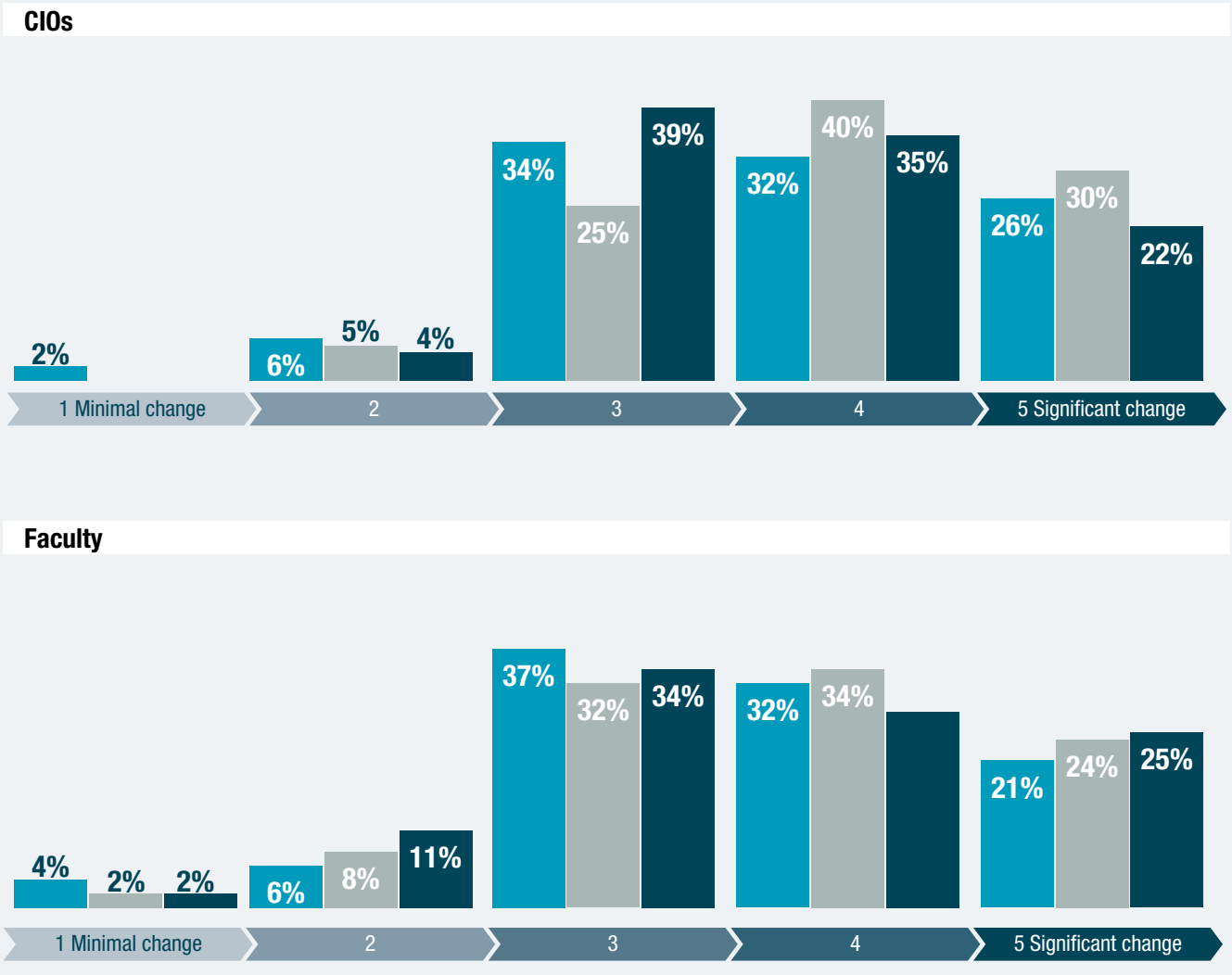
FIGURE 12
CIO and faculty attitudes on how much change is needed to adapt to technology in the next decade.



CIOs and faculty members at public universities were more likely than their peers at private universities or community colleges to say that their institutions needed to shift their thinking in how they will use information technology in the future (see Figure 13).

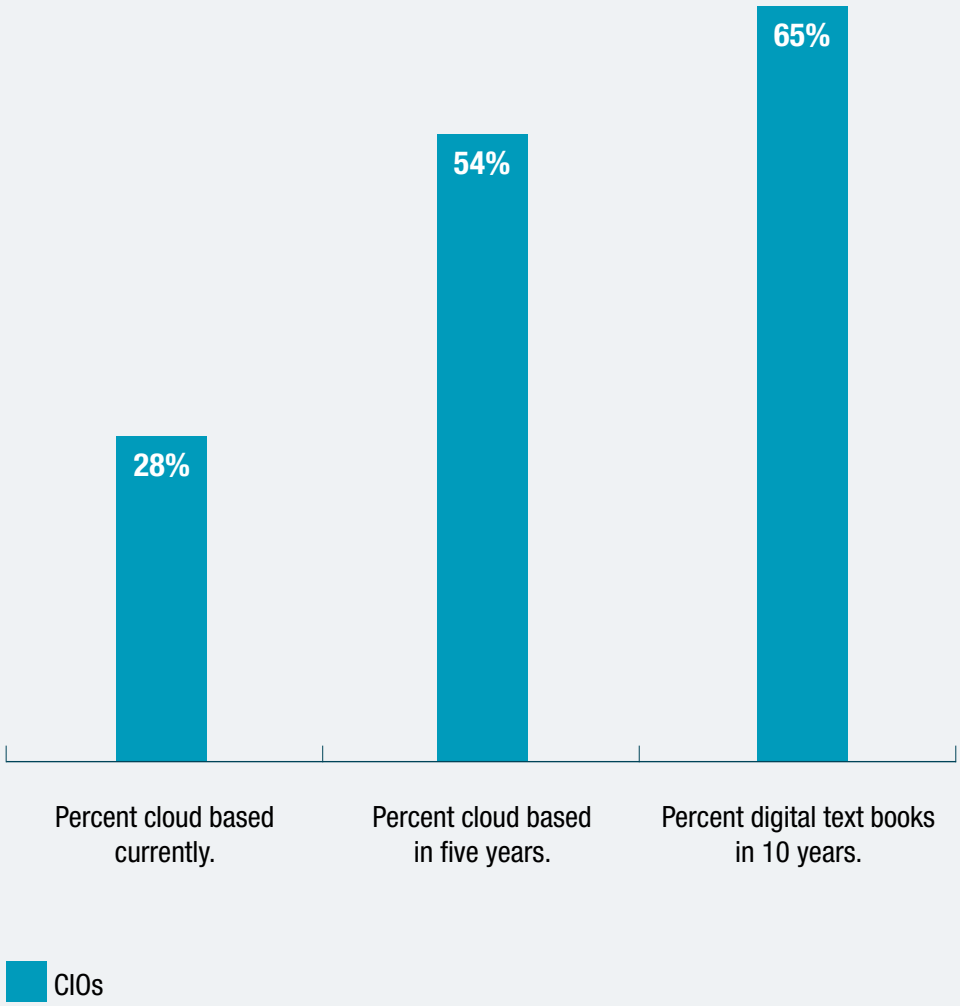
FIGURE 13

CIO and faculty attitudes on how much change is needed to adapt to technology in the next decade, by institution type.



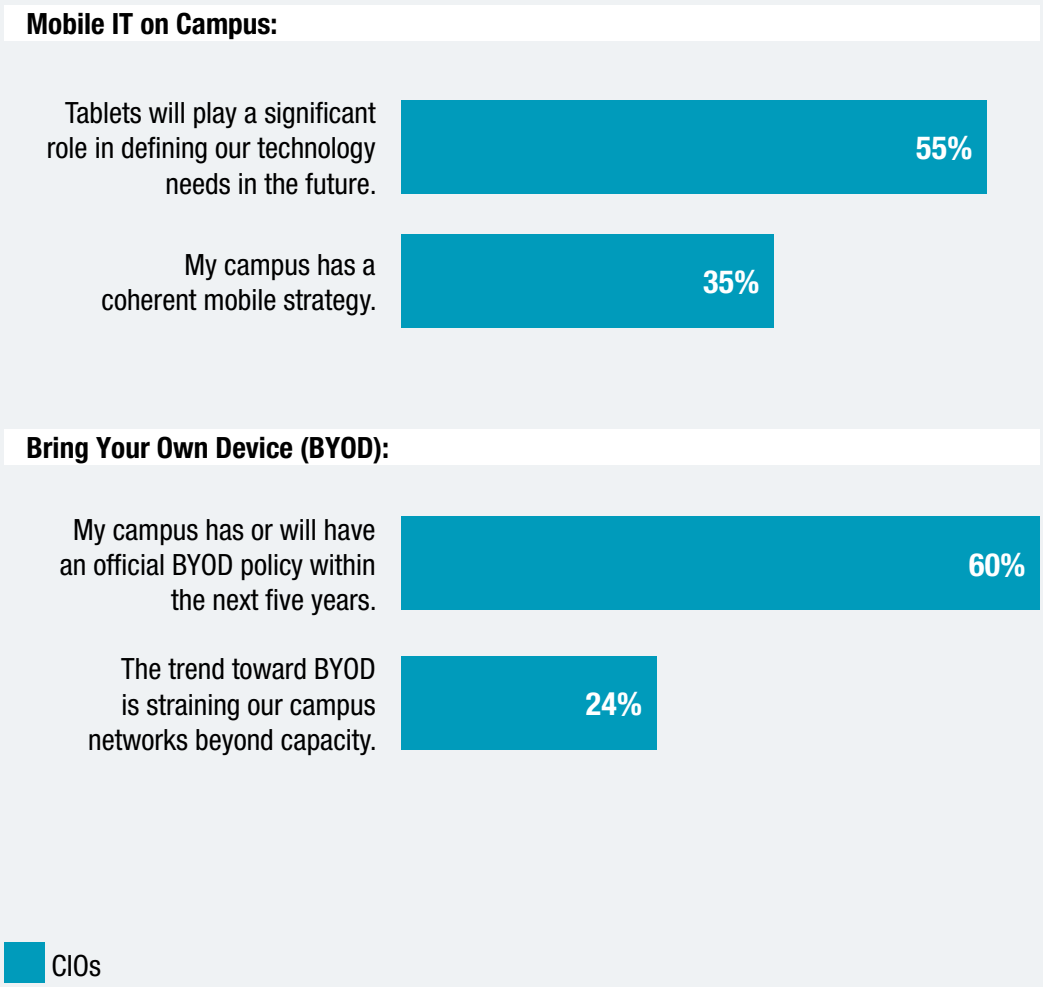
Despite saying that only moderate changes will be needed, CIOs at the same time, in thinking about the next developments in technology, predicted a swift change in behavior at their institutions within the next decade. The technology officers predicted that within five years the number of systems on their campuses in the cloud would double, accounting for more than 50 percent of what they would be running. And within 10 years, some two-thirds of textbooks used by students would be entirely digital (see Figure 14).

FIGURE 14
CIO Attitudes on cloud-based computing and digital textbooks.



More than half of CIOs said that mobile tablets would play a significant role in defining their technology needs in the future, although only one-third of them said they had a coherent mobile strategy. One quarter of technology officers said the trend toward students bringing their own devices to campus was straining their networks beyond capacity, with some 60 percent of them predicting their institutions would need an official policy within the next five years on such devices, if they didn't already have one (see Figure 15).

FIGURE 15
CIO attitudes on the future role of mobile IT and Bring Your Own Devices (BYOD).



CONCLUSION

Although technology functioned on the periphery of college and university campuses over the past two decades, it is now becoming central to what is going on in the classroom. Mobile technology and the arrival of a generation of students raised on the Internet and handheld devices will only hasten the effect of technology on learning. CIOs and faculty predict these advances will result in many changes at their institutions in the future, though not fundamental ones.

The survey shows that when it comes to how technology is used on campuses, the people running the technology operation (CIOs) have a much more positive view than the people using it on a daily basis (faculty). Faculty also have a more negative view on whether their needs and the demands of their departments are being met by a centralized information-technology department.

Finally, while professors and technology officers were mostly in agreement about the innovations that may take hold in higher education over the coming decade—"Yes" to hybrid courses, but "No" to MOOCs—CIOs were more enthusiastic than faculty about these changes and the positive impact they might have on their institutions. As with previous Chronicle surveys conducted of presidents and faculty members on similar subjects, it's not that professors don't like some of the technology that could potentially change how education is delivered or measured, it's just that they might take longer and need more evidence to embrace those changes.

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METHODOLOGY

The results of *College 2.0: How Chief Information Officers and Faculty View the Future of Higher Education* are based on responses from chief information officers and faculty members at private (not-for-profit) four-year, public four-year, and public two-year institutions. Huron Consulting Group conducted the online survey for The Chronicle. Of those invited, 259 CIOs and 808 faculty members completed the survey. The data collection took place in July and August 2014.

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