

# The future of higher education: How technology will shape learning

A report from the Economist Intelligence Unit  
Sponsored by the New Media Consortium







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## Preface

*The future of higher education: how technology will shape learning* is an Economist Intelligence Unit white paper, sponsored by the New Media Consortium. The Economist Intelligence Unit's editorial team executed the survey, conducted the interviews and wrote the report. The findings and views expressed do not necessarily reflect the views of the sponsor. Marie Glenn was the author of the report, and Debra D'Agostino was the editor. Larry Johnson, CEO of the New Media Consortium, contributed to the research design.

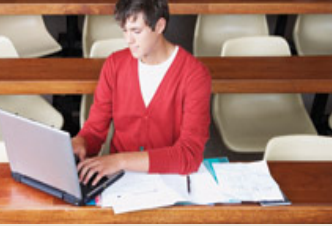
October 2008

### About the survey

Our research drew on two main initiatives conducted in July and August 2008: a global online executive survey and in-depth interviews. Of the 289 executives responding to the survey, 189 participants came from higher education and 100 came from corporate settings. The US accounted for slightly over one-half (154) of all respondents, with the remainder distributed through Europe (69), Asia-Pacific (43) and the rest of the world (23). Of this total, board

members and C-level respondents made up 43% of private-sector respondents, while professors, deans and other faculty members accounted for 86% of those surveyed from academic institutions.

In addition, 12 interviews were held with university chief information officers and leaders in the private sector to gauge reaction to the survey's findings and gain deeper insight into the wider impact of technology on both higher education and the job-preparedness of today's graduates. Our thanks are due to all survey respondents and interviewees for their time and insights.



## Executive summary

**T**echnological innovation, long a hallmark of academic research, may now be changing the very way that universities teach and students learn. For academic institutions, charged with equipping graduates to compete in today's knowledge economy, the possibilities are great. Distance education, sophisticated learning-management systems and the opportunity to collaborate with research partners from around the world are just some of the transformational benefits that universities are embracing.

But significant challenges also loom. For all of its benefits, technology remains a disruptive innovation—and an expensive one. Faculty members used to teaching in one way may be loath to invest the time to learn new methods, and may lack the budget for needed support. This paper examines the role of technology in shaping the future of higher education. The major findings are as follows:

- *Technology has had—and will continue to have—a significant impact on higher education.* Nearly two-thirds (63%) of survey respondents from both the public and private sectors say that technological innovation will have a major influence on teaching methodologies over the next five years. In fact, technology will become a core differentiator in attracting students and corporate partners.
- *Online learning is gaining a firm foothold in universities around the world.* More than two-thirds of respondents from academia say that their institutions offer online courses. Many of them, especially those with a public-service mandate, consider online learning key to advancing their mission, placing advanced education within reach of people who might otherwise not be able to access it.
- *Corporate-academic partnerships will form an increasing part of the university experience,* at a time when locating funding and controlling costs are key concerns, and when only one-quarter of university chief information officers (CIOs) have a place at the table when it comes to setting strategy. To attract corporate partnerships, institutions will need to demonstrate a commitment to advanced technologies.
- *University respondents view technology as having a largely positive impact on their campuses,* but acknowledge that operational challenges may hinder the full benefits from being realised (for example, tenure, promotions and other organisational practices may need adjustment to encourage faculty members to adopt new technologies). In addition, technology may be disruptive in ways not intended: respondents note a rise in student plagiarism, cheating and distractibility, which they attribute to easy and ready access to mobile technologies.
- *Higher education is responding to globalisation.* Respondents say that having an overseas presence will be the norm for the majority of universities over the coming years, and 54% of academic respondents say their institutions either already have foreign locations or plan to open them in the next three years. Distance education is also becoming increasingly global, with universities in the US and overseas leveraging advanced technologies to put education within reach of many more individuals around the world.



## Introduction

**N**o generation is more at ease with online, collaborative technologies than today's young people—"digital natives", who have grown up in an immersive computing environment. Where a notebook and pen may have formed the tool kit of prior generations, today's students come to class armed with smart phones, laptops and iPods.

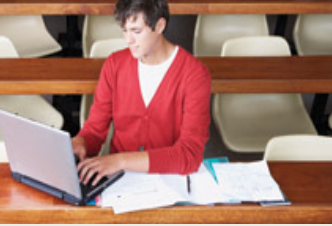
This era of pervasive technology has significant implications for higher education. Nearly two-thirds (63%) of survey respondents from the public and private sectors say that technological innovation will have a major impact on teaching methodologies over the next five years. "Technology allows students to become much more engaged in constructing their own knowledge, and cognitive studies show that ability is key to learning success," says New York City-based Queens College vice-president of institutional advancement, Susan Henderson.

Online degree programmes and distance learning have gained a firm foothold in universities around the world. What was once considered a niche channel for the delivery of educational content has rapidly become mainstream, creating wider access to education, new markets for content and expanded revenue opportunities for academic institutions. Sixty percent of those polled say that the technological change occurring in our midst will alter the perception of the college campus from a one-dimensional (physical) concept to a multi-dimensional (physical and online) one. "Law school students enrolled in hybrid programmes that integrate distance and in-class education outperform those who study exclusively in one environment," says Tom Delaney, associate dean and CIO of the New York University (NYU) School of Law, of the results of a recent limited trial at his school.

New technologies are also affecting other areas of campus administration. Social-networking tools are helping to build connections with alumni and support career service activities. E-marketing campaigns expand the reach and success of recruiting and fundraising efforts, and drive down the cost of direct-mail campaigns. And automated, self-service programmes reduce administrative requirements, streamline course registration and enhance academic life.

Although university participants view these changes as having a largely positive impact, many institutions struggle with the twin challenges of rising information technology (IT) costs and the need to avoid technological obsolescence. In addition, insufficient resources, a lack of adequate instructional design staff and other technological support issues can also impede the adoption of new technologies. Despite these challenges, most believe that technology will become ever more interwoven into the fabric of academic life.

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## How technology is changing today's classrooms

**T**echnology is enabling multi-modal teaching, changing curricula and spawning rich forms of online research and collaboration. Nearly 60% of survey respondents say that professors will soon teach in more than one medium. At NYU's top-ranked tax law programme, for instance, classroom courses are filmed with three cameras and a sound mixer. "The course goes online within 30 minutes," says Mr Delaney. "Within 24 hours, students interested in reviewing a certain case or topic can click an online index that charts the content of the entire class and [can] view the portion that interests them."

When asked to compare different communications technologies, 52% of survey respondents state that online collaboration tools would make the greatest contribution in terms of improving educational quality over the next five years—the top response—while 48% point to the dynamic delivery of content and software that supports individually paced learning. Sophisticated learning-management systems and enhanced video and presentation tools are among other innovations that respondents say are likely to have a profound effect on the academic experience.

It is interesting to note that despite the growing array of technology-enabled teaching tools available, nearly three-quarters of participants say that the greatest potential benefit of technology is something far more straightforward—namely, the expanded access to educational and reference resources that it provides.

According to the survey results, online-collaboration tools, software that supports individually paced learning, and learning-management systems are among the communications technologies most expected to improve academics over the next five years. Web 2.0 technologies such as wikis, instant messaging and social networking—which have been influential in improving connectivity in many settings and are in use now at a large number of institutions—are expected to decline in use over that period. By contrast, online gaming and simulation software are cited by 54% of higher-education respondents and 59% of corporate respondents as an innovation likely to be adopted among universities over the next five years. Faculty members, administrators and CIOs are also exploring how web applications and freeware such as Google docs can improve efficiency and reduce costs.

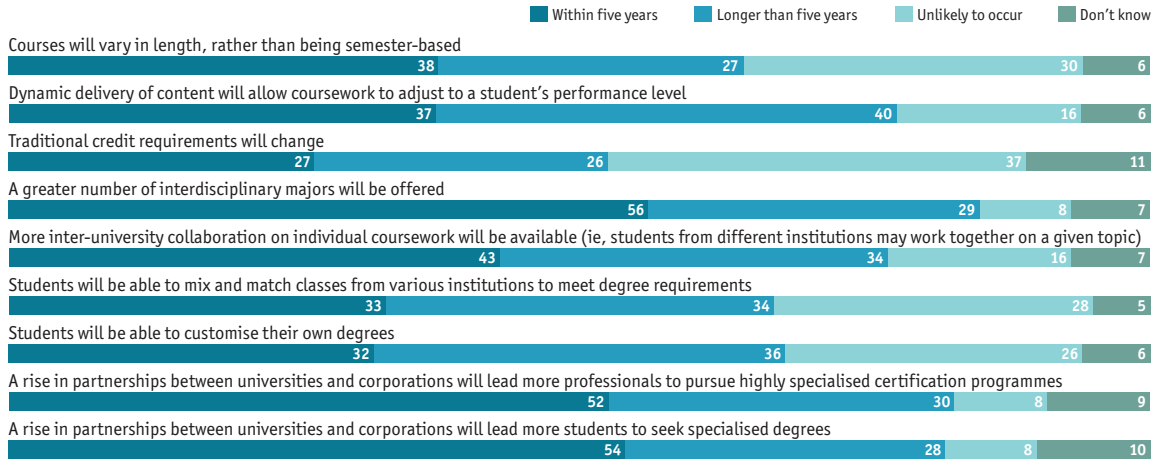
Collectively, such advances may lead to profound changes in the way courses are taught. "Teaching will become more outcome-based and student-centred," says Polley Ann McClure, CIO of Cornell University in Ithaca, New York. "To be truly transformative," she adds, "instructional paradigms will have to shift." Instead of focusing on memorisation of material by their students, instructors will focus on the application of knowledge to particular problems. Says Ms McClure: "Students need to feel that they can plot their own academic path. If a student wants to, they should be allowed to take the final





**How is technology most likely to affect academic course and degree offerings in your country?**

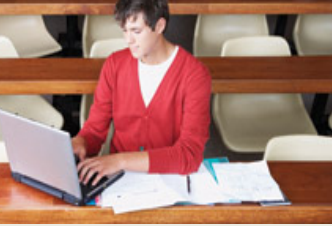
(% respondents)



exam on the first day of school, and get credit for the portion of the course they've passed. If they answer 80% of the test correctly, for example, testing software would identify the issues behind the 20% of wrong answers and focus student attention on those areas instead."

It's a view that others across the higher-education spectrum share. "The professor's role is evolving from instructor to mentor," says Sam Scalise, CIO of Sonoma State University, in California's wine country. "Homework, quizzes and projects will have to be designed in such a way as to require genuine thoughtfulness on the part of the student. That paradigm shift offers enormous potential for advancing educational quality."

Finally, respondents foresee an interesting range of possibilities regarding how technology is most likely to affect future academic offerings, spurred by innovative faculty research, student engagement and the pursuit of academic collaboration. Over the next five years, 56% of respondents expect to see a greater number of interdisciplinary majors, combining chemical engineering and environmental studies for instance, and 43% foresee broader inter-university collaboration among students from multiple institutions. Looking beyond the five-year horizon, more than two-thirds of all respondents say that students will be able to craft individualised degree programmes, either within their own university or by bundling coursework from different institutions. And more than one-half see the publishing world evolving as a result of all these developments, with textbooks and printed documents eventually being replaced by online materials. "The rise of online peer review may mean that some texts exist exclusively in virtual form, where they can be updated and refined in real time," says Linda O'Brien, CIO of the University of Melbourne in Australia.



## The expanding role of online learning

**M**ore than two-thirds of those surveyed from academic settings say their institutions offer online courses today. The specialisation, customisation and convenience that distance education affords has found an eager audience among students, working professionals and employers. Many academic institutions, and especially those with a public-service mandate, consider online learning key to advancing their mission, placing post-graduate education within reach of people who might otherwise not be able to access it. Recently named the top wired university in the US by *PC Magazine*, the University of Illinois at Urbana Champaign offers a case in point. As Scott D Johnson, CIO and associate dean for online learning in the College of Education, observes, “As a public, land-grant university, our mission is grounded on the premise of education for all.”

In January 2008 the university marked a significant leap forward in what had already been a long history in distance education, by launching the University of Illinois Global Campus—an integrated online programme created in collaboration with the colleges and academic departments at the university’s residential campuses. “The ability to offer greater access to educational opportunities

### **CASE STUDY** The Open University of Catalonia

In existence for 14 years, with 45,000 students from 45 countries around the world, the Open University of Catalonia (UOC) in Spain has a long history in the field of online learning. Llorenç Valverde is the UOC’s vice-rector of technology, and leads educational-technology initiatives and innovations.

“What’s different about the UOC,” says Mr Valverde, “is not just that the university is 100% online. It’s that the student is at the centre of his or her own academic programme. This is the main point of our learning model. We have moved from the stage where professors are giving lectures to a point where students, mentored by their faculty members, can take the knowledge that they need directly.” The UOC’s virtual desktop, for example, allows students to navigate at will through tabs that feature planning and scheduling, teacher and classmate communications, a digital library and web resources, and testing and assessment.

Many of those who attend the UOC work full-time, have families or have other commitments. They come to the UOC to pursue post-

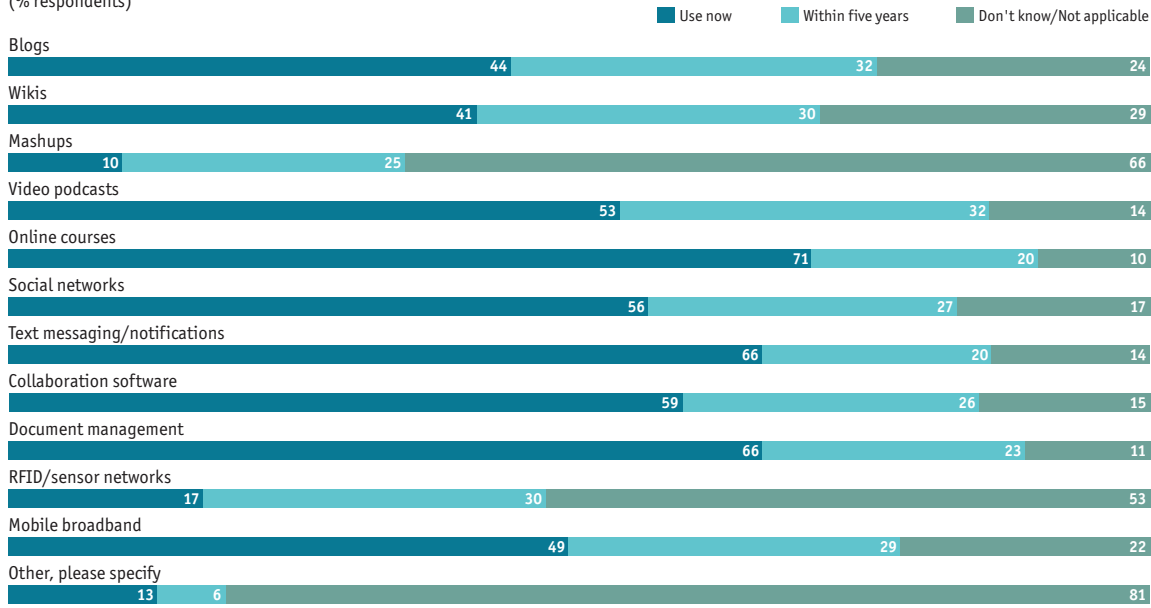
graduate degrees, to obtain specialised certification or to complete their bachelor’s requirements. Inspired by this demographic, the UOC recognised early on that distance education is not only about recording videos and putting them online. “I cannot imagine making a student sit down in front of a computer and listen to a one-hour lecture after dinner and a hard day at the office.” Instead, says Mr Valverde, “our aim and the aim of all of those involved in education, distance or not, should be to use technology in a more proactive and interactive way, to help students in their learning process.”

With that end in mind, Mr Valverde states that the UOC’s greatest challenge is aligning educational content and interaction with the right channels. “The computer will not be the only interface to offer high-quality distance learning,” he says. “Mobile technologies will allow an increasingly diffuse array of interactions, extending the reach and accessibility of educational offerings to more students. If we can think about that sort of world, where the computer is not the primary medium, then the challenge becomes how to deliver content and interaction effectively across all channels, particularly with new possibilities such as social networking, coming online.”



**Which tools does your institution currently use, and which do you think will be used within five years?**

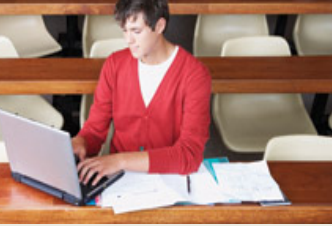
(% respondents)



was the primary catalyst,” Dr Johnson acknowledges. “There are many people who desire certification or degree programmes who simply cannot attend a residential programme, be they single mothers, working professionals or non-traditional students. It’s part of our public mission to reach those people, and we see e-learning as a vital tool in making that possible.”

While distance-education programmes continue to grow in number and to improve in quality, most survey participants see online courses as a supplement to face-to-face classes, and nearly two-thirds of respondents maintain that traditional degrees carry greater credibility than those earned online. Corporate participants hold this view most staunchly. Few participants (11%) say that online and in-class students are likely to take the same classes together and compete for top grades.

Perceptions may be shifting, however. A number of elite institutions, such as Johns Hopkins in Maryland and Stanford University in California, offer highly regarded online courses, and students who complete coursework through Stanford’s Educational Program for Gifted Youth (EPGY) and matriculate as undergraduates may use these credits towards their bachelor’s degrees.



## Global competition and the workforce

**I**n today's technology-enabled knowledge economy, many universities find themselves facing a new challenge: how not only to equip students with an adequate education in their field of study, but also to arm them with the skills and knowledge required to leverage technology effectively in the workplace. How well do current graduates fare? Some academics in the US warn that the quality of their domestic university brand may be slipping. Private-sector respondents are particularly concerned, with 46% expressing worry that the US is lagging behind other countries in its ability to produce high-quality professionals. In fact, only about 40% of all survey respondents believe that current graduates are able to compete successfully in today's global marketplace.

Generational issues also play a role in training the workforce of the future. For more than a decade, author Amy Lynch has studied Generation Y (individuals born between 1982 and 2001, also referred

### **CASE STUDY** Generation Y perspectives at Merrill Lynch

When it comes to understanding Generation Y career attitudes and aspirations, Mary Middleton operates at ground zero. As head of talent resourcing for Merrill Lynch's Europe, Middle East and Africa group, she recruits and trains hundreds of new graduate employees each year, a position that allows her to witness first hand the job-readiness of today's graduates.

"We are definitely seeing generational differences," says Ms Middleton. The hovering-helicopter parent is perhaps the most glaring example: more than once, Ms Middleton has picked up the telephone to find a parent on the other end of the line, asking to organise interviews, solicit feedback and even negotiate salaries for their children. "It's becoming common," says Ms Middleton, who adds that such intervention often backfires, since employers seek evidence of independence and individual decision-making in their candidate-selection process.

Companies like Merrill Lynch are pushing back on universities to better manage expectations among their student populations and reinforce foundational skills. Although graduates are entering the workforce with high multi-sensory-processing and technological abilities, Ms Middleton has noticed a decline in numeracy—feedback

that she hopes universities will take on board.

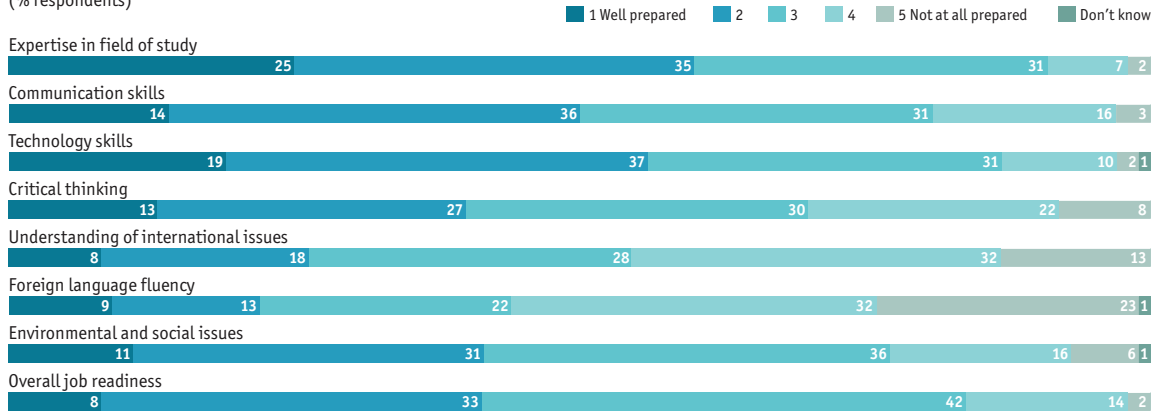
At the same time, Ms Middleton is quick to point out that new graduates also bring many strengths. Merrill Lynch puts all new graduate hires through an interactive, online testing programme that simulates an actual working environment. Says Ms Middleton, "We bombard candidates with information from multiple sources. Students spend a few minutes watching a screen that may have stock market indices in one corner, a news crawler running along the bottom and a video feed playing in the middle. Then we'll ask a series of questions to see how well they recollect relevant content. To our delight, we have found that today's graduates seem adept at processing multiple information streams." Having grown up toggling between multiple forms of media (iPods, instant messaging, streaming video and so on), millennials may have a shorter learning curve when it comes to multi-tasking in today's online environment.

Millennial impatience with staid, three-hour lectures has also forced the company to revamp its training curriculum. Merrill Lynch now offers a mixed menu of targeted sessions that feature senior speakers, multimedia and interactive components. "It's a genuinely collaborative environment," concludes Ms Middleton. "New graduates teach us new ways of doing business, while we impart other essential skills that have stood us in good stead throughout the years."



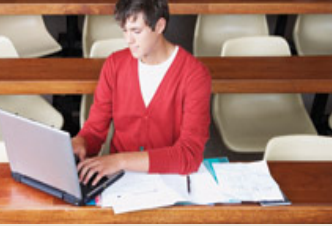
**With regard to the following, how well prepared do you feel your country's university and college students are to compete in today's global marketplace?**

Please rate on a scale of 1 to 5 where 1=Well prepared and 5=Not at all prepared.  
(% respondents)



to as “millennials”) and the American culture shaping it. When considering overall job-readiness, she says that “today’s millennials are open to collaboration, have an enormous facility for multi-tasking, and are at ease with new technologies. But they seem to have more limited experience in independent decision-making than past generations.” To help impart that experience, universities may need to ensure that collaborative student projects have not only an online instructional component but defined areas of individual responsibility as well.

Although employers expect graduates to have amassed most of the requisite technology skills before joining their organisations, more than one-third of those responding from the private sector say that they assume some on-the-job training will be necessary to acclimatise new employees. “This generation is not content with passive involvement,” says Ms Lynch. “Companies need to make training programmes more engaging, retention programmes more personalised, and process improvement initiatives more open to employee input.”



## Collaboration extends to corporate-academic partnerships

Whereas university research and development departments may once have been the primary arena for testing new tools and theories, the survey data reveal that corporations now have the edge in adopting new innovations. Only one in five respondents report that their domestic academic institutions are quicker than companies to develop and implement new technologies; roughly 66% say the reverse is true. Perhaps as a consequence, recent years have seen a surge in research-driven public- and private-sector relationships. Money is part of the issue, according to Cornell's Ms McClure: "Today's students are used to getting what they need instantly. Universities have to respond to remain competitive, but those innovations often cost millions of dollars. How to fund those investments appropriately is on the top of everyone's mind."

As more and more universities look to the private sector to support and extend technological advances, companies can be selective in choosing partners. Ninety-three percent of private-sector respondents say that the quality of a university's technology will be a significant factor in their

### **CASE STUDY** University of Melbourne

As one of Australia's leading universities, the University of Melbourne caters to the information needs of roughly 44,500 students. Linda O'Brien, until recently the institution's vice-principal and CIO, leads that charge, and views the university's IT-enabled research capabilities as a distinguishing asset. "We believe that technology can extend the research-teaching boundary and contribute to knowledge transfer and community engagement." She cites the university's recent involvement in digitising rare audio recordings, an initiative that proved a boon not only to anthropologists but to the medical community as well, when it was discovered that the recordings offered data on the spread of disease through communities over time. "This provides useful information for those interested in history and medical science, while at the same time creating a bridge into our teaching programme," says Ms O'Brien.

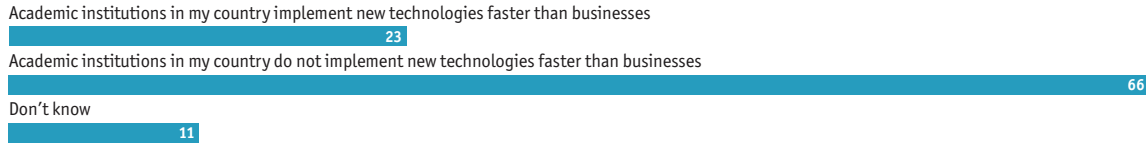
Such partnerships between the community, the private sector and higher education will take on increasing importance, Ms O'Brien believes. "Technology is enabling a blurring of the boundaries across knowledge creation, knowledge use and transfer."

One hypothesis being tested by an Australian government commission examining the question of national innovation is whether corporate-academic partnerships might offer a helpful means of extending the scale of research and funding for it. The University of Melbourne's vice-chancellor is on the government review panel, and, although the study is still ongoing, Ms O'Brien says that early findings suggest that corporate-university partnerships will play a pivotal role in future innovation and research excellence.

To that end, the University of Melbourne has been working closely with a leading global technology company for the past eight months. "From research to scholarships, there's a huge suite of outcomes that can arise from these types of partnerships," says Ms O'Brien. "It's not purely about money; it's about leveraging the different strengths that partners can bring." She adds: "There's a growing realisation that partnering can drive better results for both parties. As a research-driven institution, we see partnering with research or private-sector institutions as a mutually beneficial means of boosting not only economic prosperity, but social prosperity as well. That's what has largely put it on the table for us."

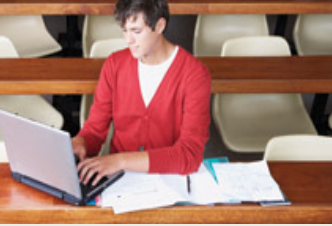


**In comparison to businesses in your country, are academic institutions ahead or behind the curve in new technology adoption?**  
(% respondents)



decision-making process. This puts institutions in a “chicken and egg” bind: on the one hand, universities need private-sector resources to sustain technological leadership, but on the other hand they must demonstrate technological prowess in order to attract that investment in the first place.

But although access to funding is one motivation, it is not the only reason for the heightened interest in corporate-academic partnerships. Some universities focus on specific areas of applied research, for example, while others provide instruction tailored to the unique requirements of particular career paths, giving corporate partners access to highly trained, “job-ready” candidates. Sonoma State University’s Mr Scalise adds: “Small campuses often cannot compete with larger universities when it comes to IT budgets, so we have to find other ways to differentiate ourselves, through niche offerings.”



More than one-third of those polled believe that tenure and promotional requirements will need to be re-weighted to include technology-based teaching criteria.

## Understanding challenges in rewiring education

Although university participants view technology as having a largely positive impact on their campuses, they acknowledge several challenges. The biggest of these may well be cost, a factor that close to 70% of university respondents cite as their greatest concern. Entrenched organisational cultures may be another hurdle, as academic faculty members accustomed to traditional modes of instruction may be disinclined to change. In fact, more than one-third of those polled say that tenure and promotional requirements will need to be re-weighted to include technology-based teaching criteria.

Then there is the question of IT's alignment with overall leadership and policy setting. Today, relatively few university CIOs have a place at the table when it comes to strategy. Of those polled, only one-quarter state that their CIOs are involved in strategic matters. Given IT's expanding footprint on campus, this will likely change. Over the next three years, 43% of participants expect that the CIO role will be elevated to the university's key decision-making team. For example, when Queens College in New York completed its "Five Presidential Goals" plan a few years ago, it identified technology as one of the critical elements in moving the college forward. Out of that initiative, Naveed Husain was appointed the College's first CIO. "Our president and executive committee recognised that technology was fundamental to creating an advanced learning environment and giving Queens a real market advantage," says Mr Husain.

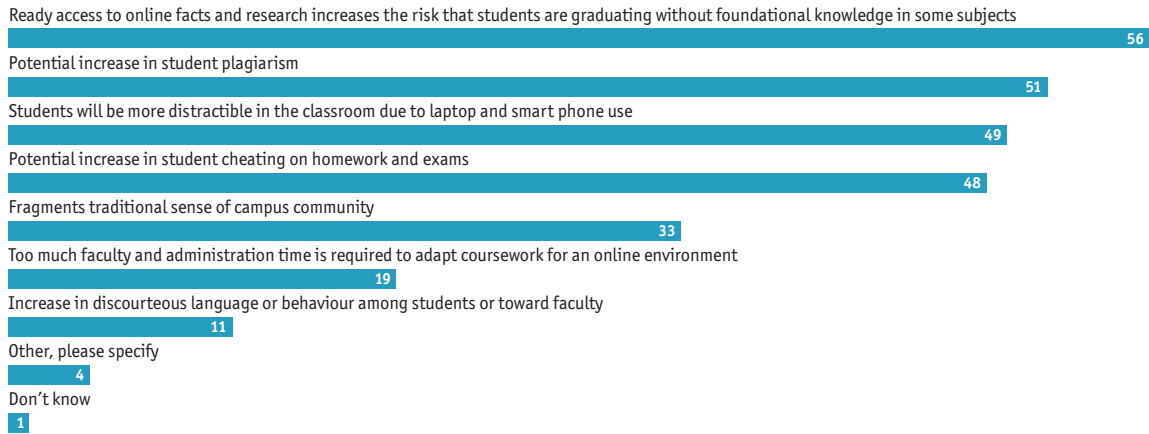
Inside the classroom, technology may be a disruptive innovation in ways not intended. Survey participants along with those interviewed note that pervasive multi-tasking between laptop, smart-phone and other technologies in the classroom often distracts students. This can be true even in highly disciplined institutions like the US Military Academy at West Point. Lieutenant Colonel Greg Conti, director of West Point's Information Technology Operations Center, says "it is impossible to sit someone in front of the world wide web and expect them not to use it. We, as faculty, teachers and administrators, have to recognise that if we're going to use technology in the classroom, we must find additional ways to keep content meaningful, even if it comes down to the simple task of requesting computer monitors down during the instructional period and back up during the hands-on portion of class."

Respondents also associate the increased use of new technologies in the classroom with a rise in plagiarism and cheating. At the University of Illinois, Dr Johnson was surprised to see instances of discourteous behaviour among students operating in the online environment. "Perhaps due to the relative anonymity of that forum, students appear to take more liberties online than they would in class." Many respondents (56%) cite easy access to online reference material as one of the greatest risks posed by the continued adoption of new technologies. Lieutenant Colonel Conti and his colleague, Lieutenant Colonel Ed Sobiesk, who run the university's Core Information Technology programme,





**In what ways do new technologies pose the greatest challenges and risks to colleges and universities?** Select up to three.  
(% of respondents)



observe that more online ethical and legal issues are coming into play. To prepare cadets, Lieutenant Colonel Sobiesk says, West Point now requires that all students receive training on intellectual property rights, online fact validation, and document sourcing and attribution.

## Conclusion

In 1964 Marshall McLuhan, the late scholar and author, coined his now famous phrase, “the medium is the message.” That statement, suggesting that the means sometimes *is* the end, could well be applied to technology and its impact on higher education. As an agent of immense change, technology has heralded our present knowledge economy and given rise to a generation of students who have never known life without a computer.

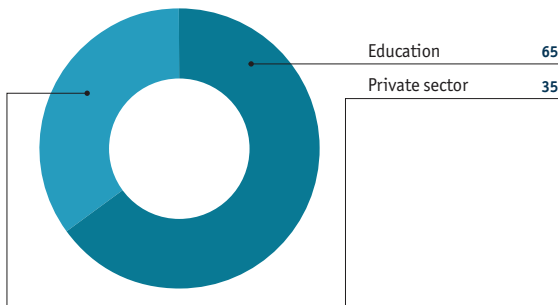
These changes will have a significant ripple effect on higher education. Over the next decade, advanced technologies will put education within the reach of many more individuals around the world, and will allow greater specialisation in curriculum and teaching methodologies than ever before. With these benefits comes the challenge of ensuring that university infrastructure and operations are in place to support the adoption of technology on campus. As ever, administrators will need to weigh carefully how budget funds are spent, decide what emerging technologies show the most promise, and determine how best to support these technological advances while avoiding the ever-present risk of obsolescence.

But perhaps the most critical question facing the academic world is something far more fundamental: namely, what it will mean to be an educated person in the 21st century. As our study indicates, these sweeping technological changes will effectively change the skill-sets of the future workforce, as well as its approach to work in general. As a result, societies around the world will need to consider how to make the most of these new opportunities and thus ensure that they remain competitive in the global marketplace.

# Appendix: Survey results

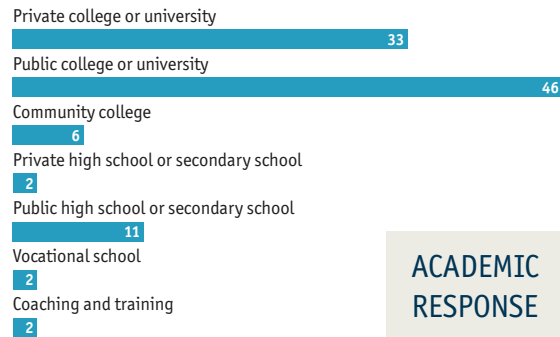
## Do you work at an educational institution or in the private sector?

(% respondents)



## What is your educational focus?

(% of respondents)



ACADEMIC  
RESPONSE

## What is your primary industry?

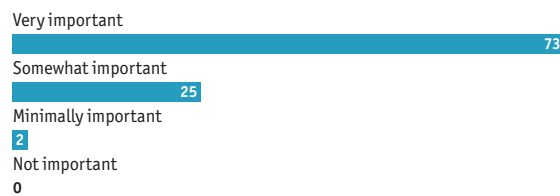
(% of respondents)



CORPORATE  
RESPONSE

## Over the next five years, how important do you think the availability of new technologies will be to students as they choose a university to attend?

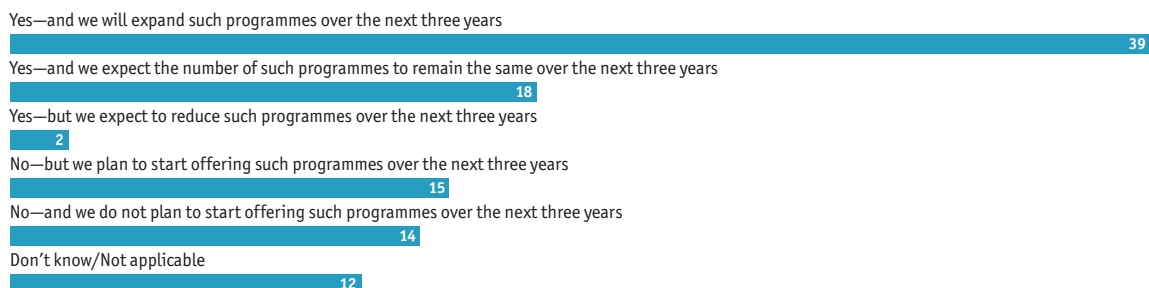
(% of respondents)



ACADEMIC  
RESPONSE

Does your university operate academic programmes outside of your home country?

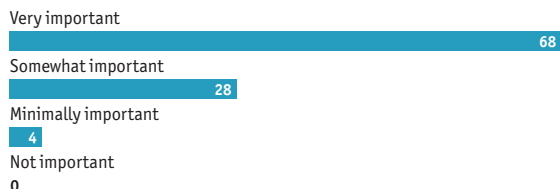
(% respondents)



CORPORATE  
RESPONSE

As a business professional, how important a factor is access to new technologies when considering a continuing education program?

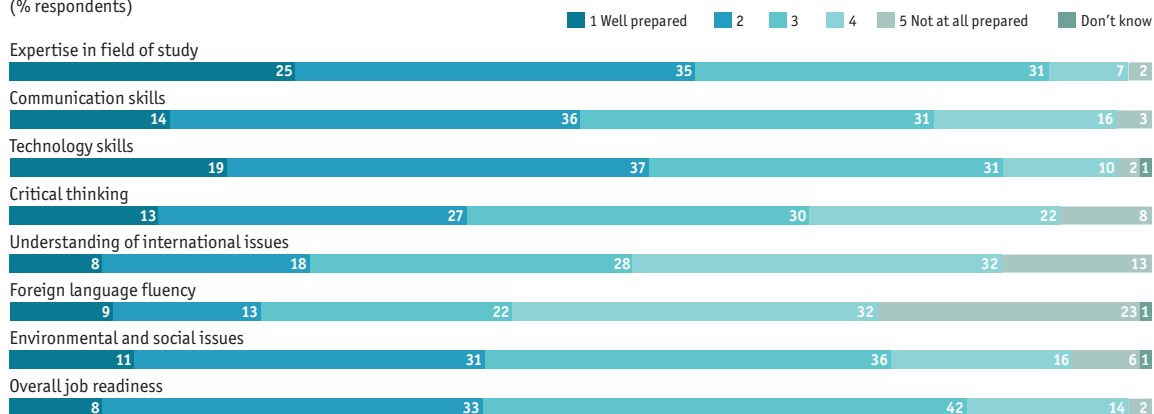
(% of respondents)



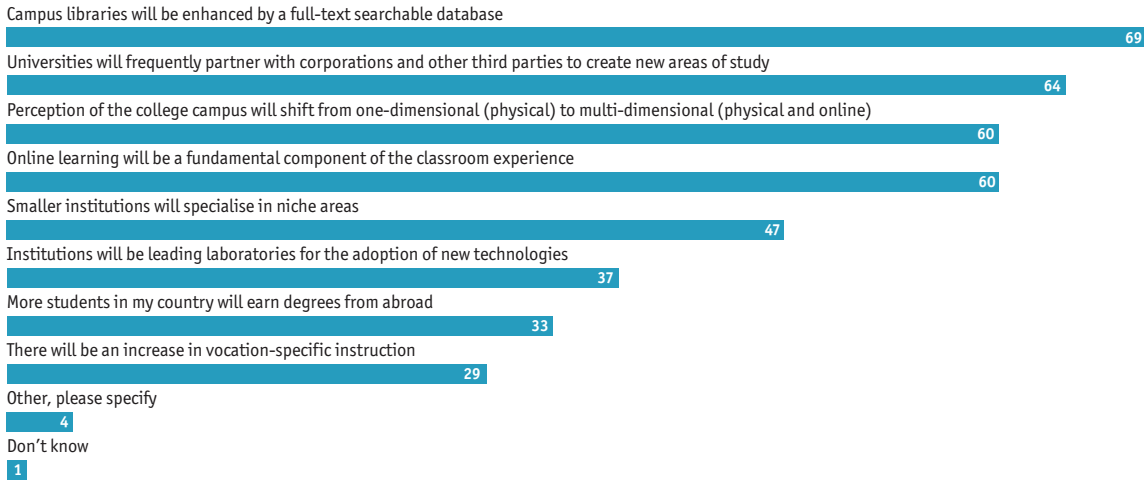
With regard to the following, how well prepared do you feel your country's university and college students are to compete in today's global marketplace?

Please rate on a scale of 1 to 5 where 1=Well prepared and 5=Not at all prepared.

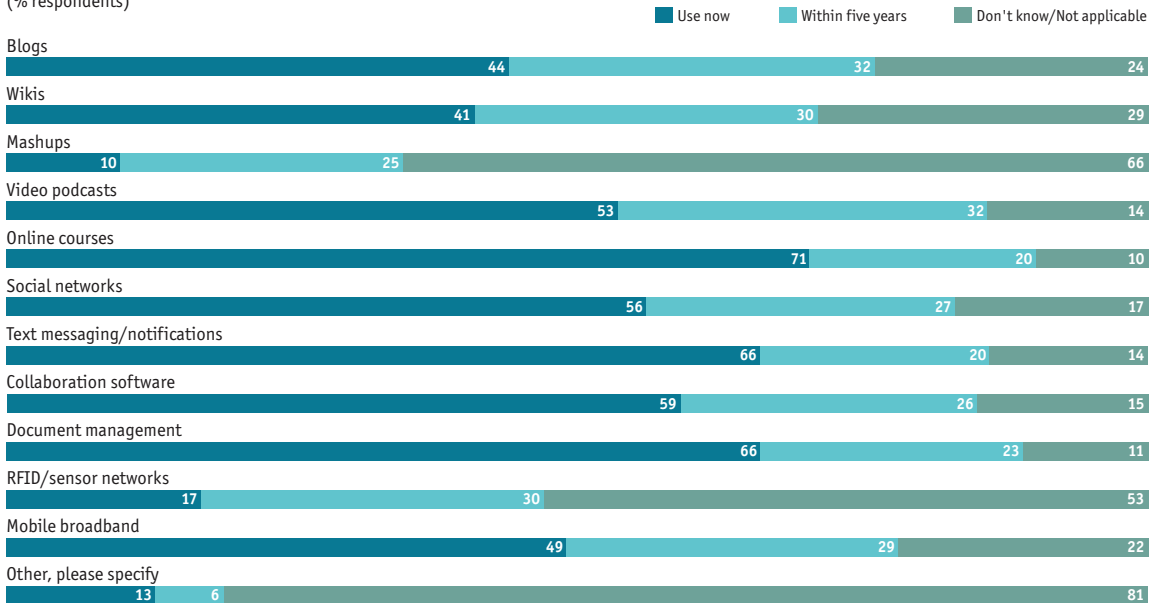
(% respondents)



**Which of the following do you think are likely scenarios in the evolution of higher education in your country over the next five years? Select all that apply**  
(% of respondents)

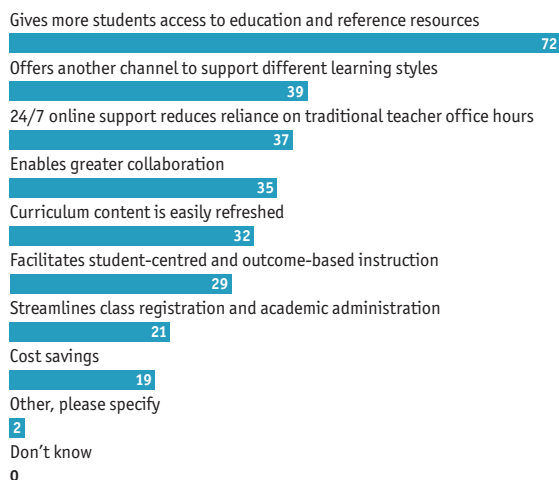


**Which tools does your institution currently use, and which do you think will be used within five years?**  
(% respondents)



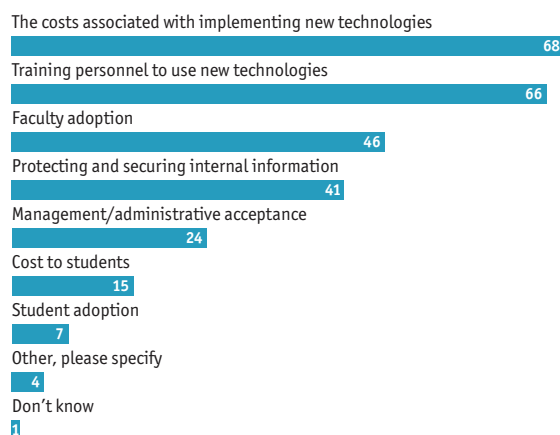
**What do you think are the biggest benefits of using technology in academic settings?** Select up to three.

(% of respondents)



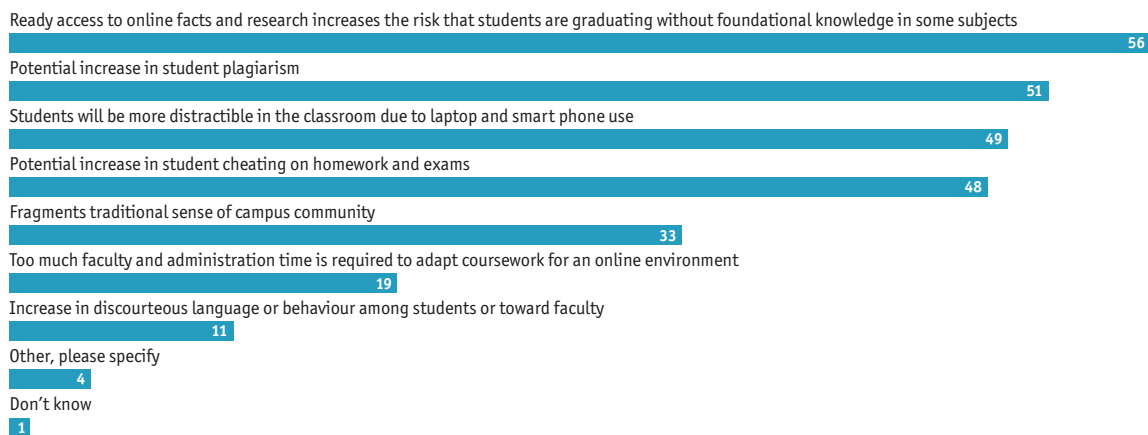
**What is the biggest challenge for institutions in adopting new technologies?** Select up to three.

(% of respondents)



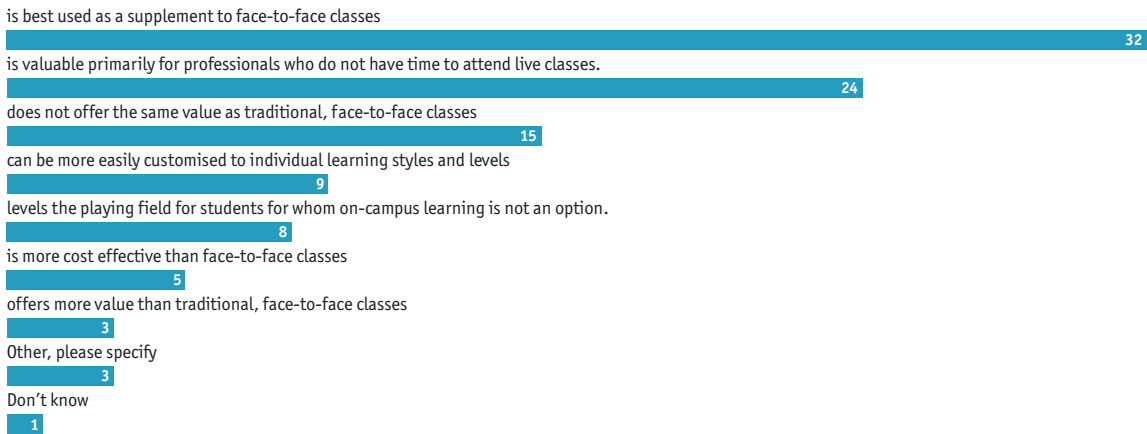
**In what ways do new technologies pose the greatest challenges and risks to colleges and universities?** Select up to three.

(% of respondents)



**Which statement best describes your overall opinion of online learning? Online learning...**

(% respondents)



**Which communications technologies do you think will most improve academics on campus over the next five years?**

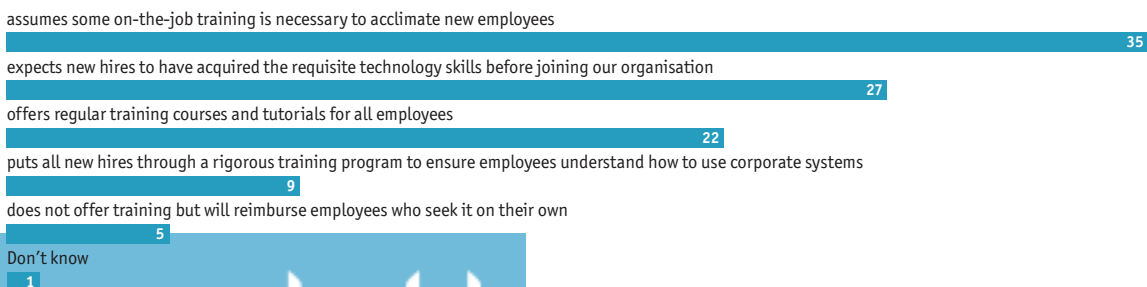
Select up to three.

(% of respondents)



**Which statement best applies to your company's approach to technology training? My company...**

(% respondents)

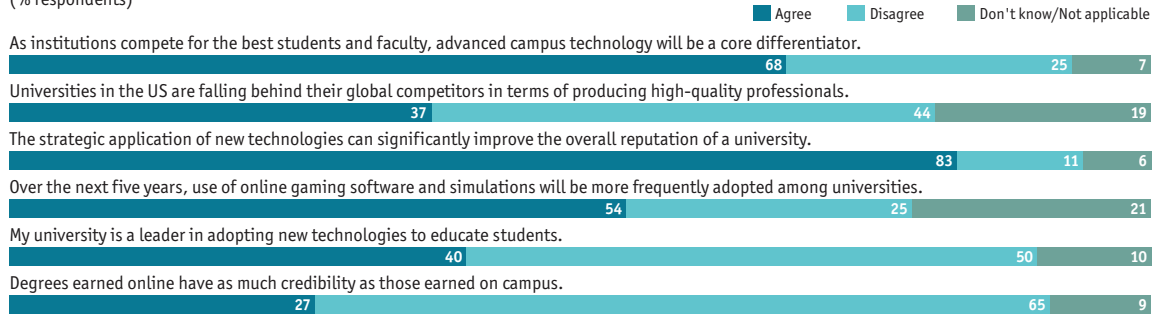


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RESPONSE

Do you agree or disagree with the following statements?

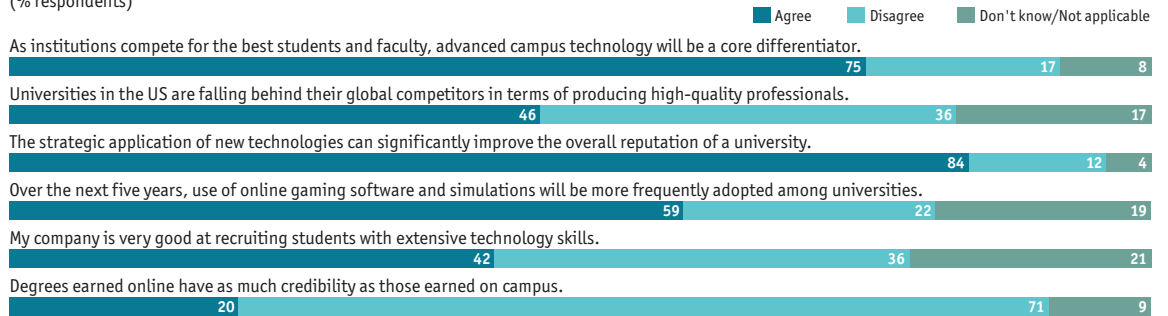
(% respondents)



CORPORATE  
RESPONSE

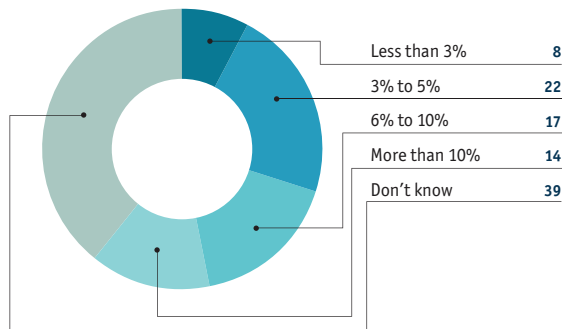
Do you agree or disagree with the following statements?

(% respondents)



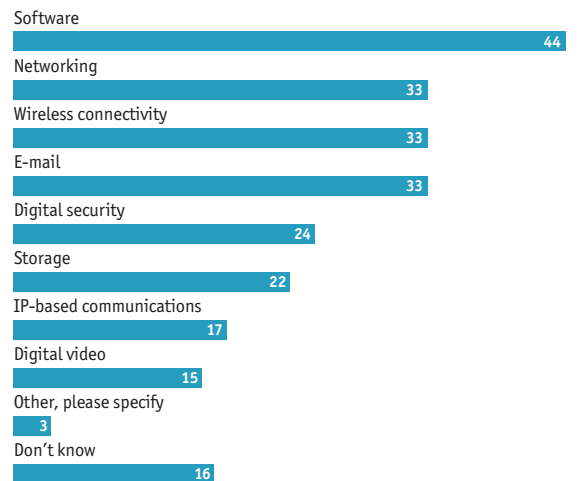
Approximately what percentage of annual revenue does your overall organisation spend on IT?

(% respondents)



In which of the following areas is your institution concentrating its IT development efforts? Select up to three.

(% of respondents)



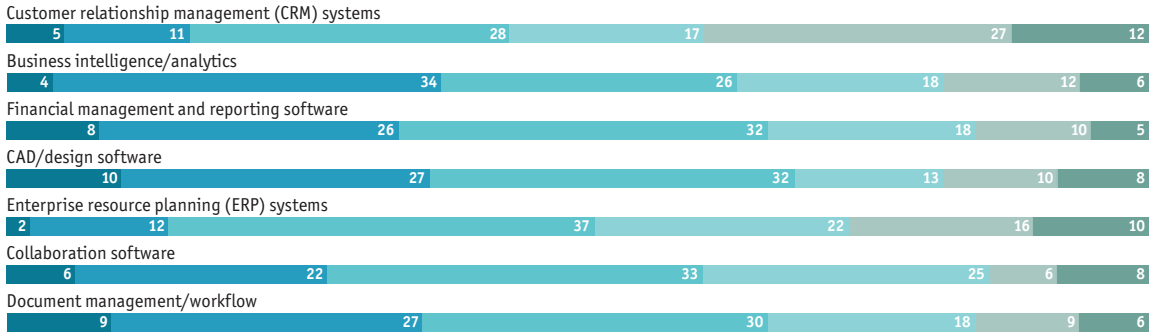


**In your opinion, how well do universities in your country prepare students to use the following business technologies?**

Rate on a scale of 1 to 5 where 1=Very well and 5=Not at all well.

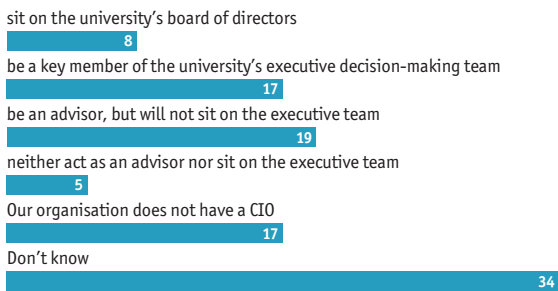
(% respondents)

1 Very well 2 3 4 5 Not at all well Don't know



**How involved is the chief information officer in creating and setting overall university strategy now? The CIO will...**

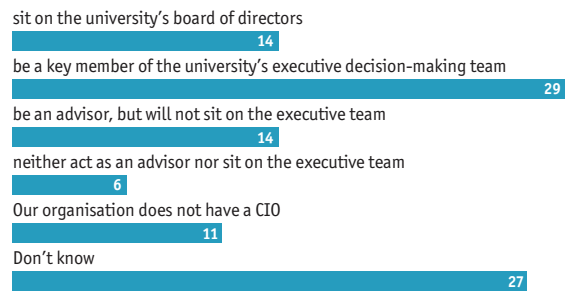
(% of respondents)



ACADEMIC  
RESPONSE

**How involved will the chief information officer in creating and setting overall university strategy be in five years? The CIO will...**

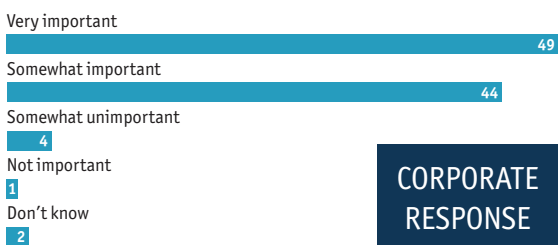
(% of respondents)



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RESPONSE

**When considering corporate partnerships with universities, how important is the university's technology strategy?**

(% of respondents)

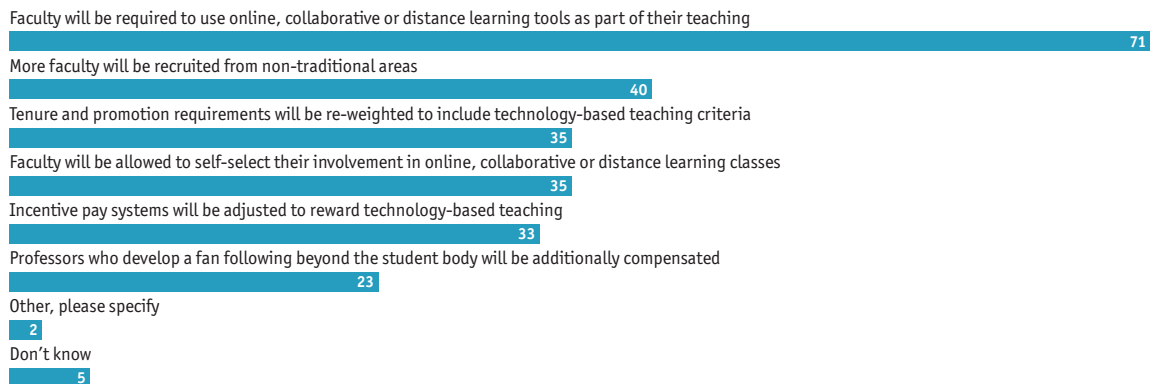


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**How do you think technology-enhanced learning will change how administrators hire, reward and/or evaluate faculty?**

Select all that apply.

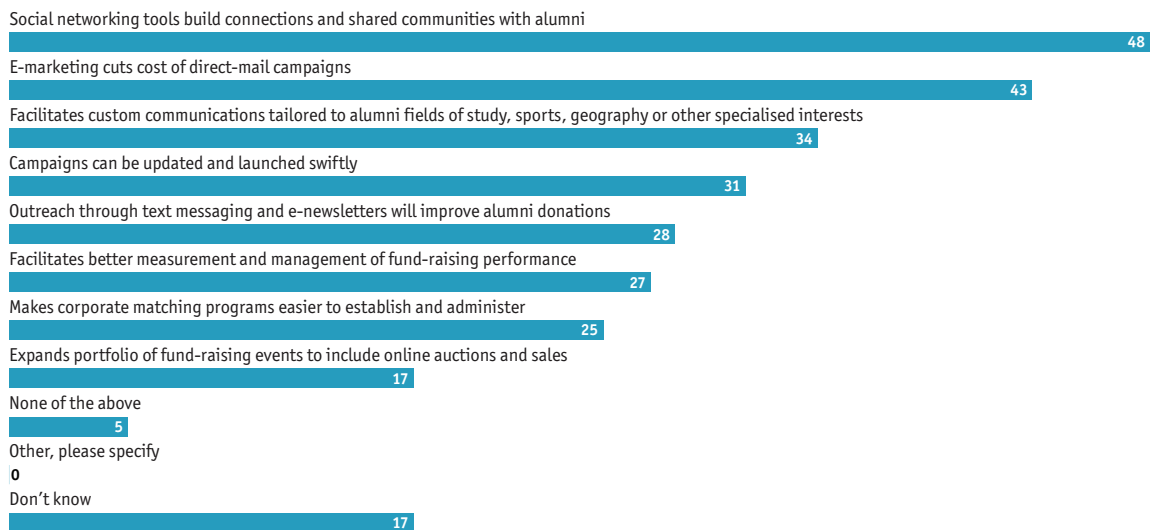
(% respondents)



**Which of the following benefits is your institution receiving by using technology in its fundraising efforts?**

Select all that apply.

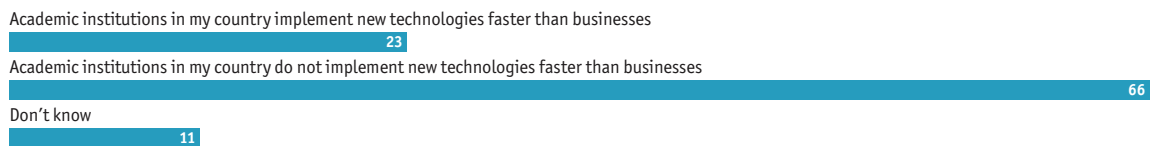
(% respondents)



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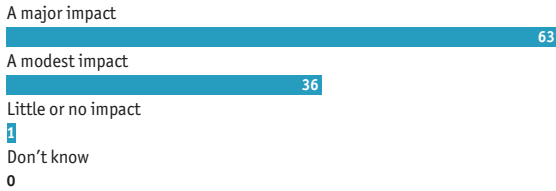
**In comparison to businesses in your country, are academic institutions ahead or behind the curve in new technology adoption?**

(% respondents)



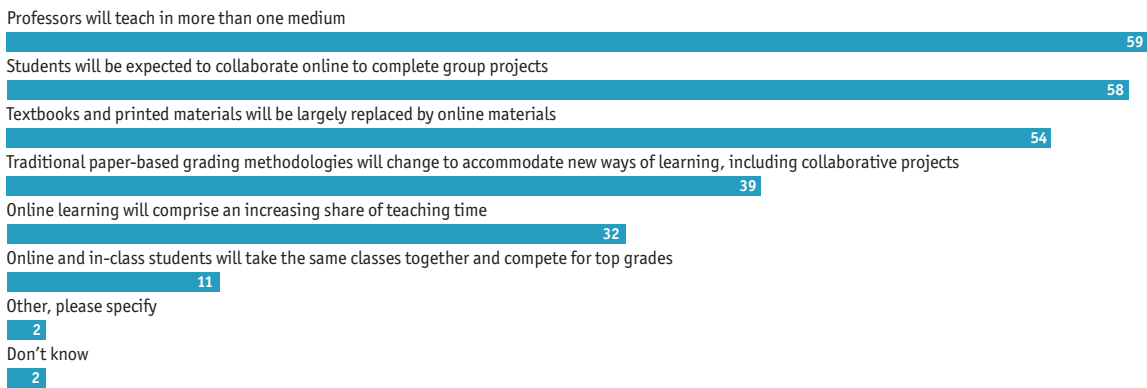
**What impact do you think technological innovation will have on teaching methodologies over the next five years?**

(% of respondents)



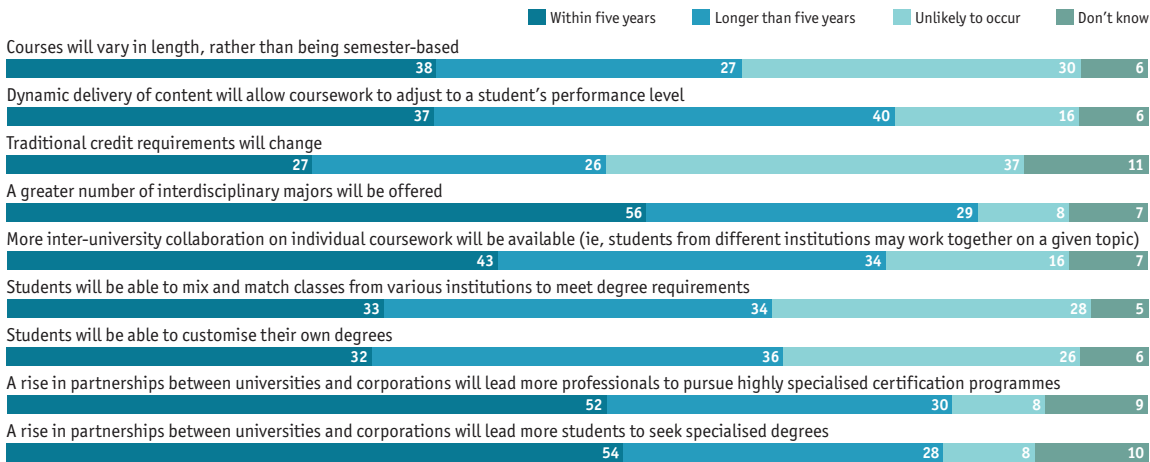
**How do you expect Web 2.0 tools (such as social networking, user-generated content, video conferencing, wikis, blogs etc.) to change the way institutions educate students in your country over the next five years? Select the top three.**

(% respondents)

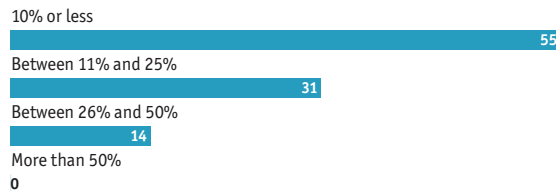


**How is technology most likely to affect academic course and degree offerings in your country?**

(% respondents)

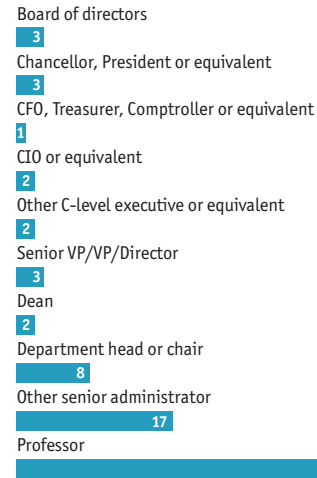


**In five years' time, what percentage of students in your country do you think will receive degrees chiefly through online methods (such as podcasting, audio, video lectures, online courses, supplemental content from non-university providers)?**  
(% of respondents)



**Which of the following best describes your job title?**

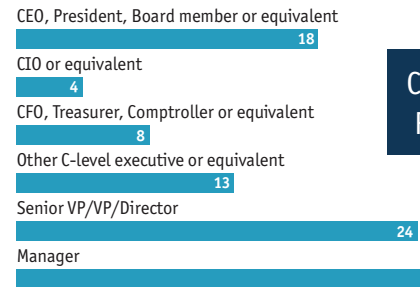
(% of respondents)



ACADEMIC  
RESPONSE

**Which of the following best describes your job title?**

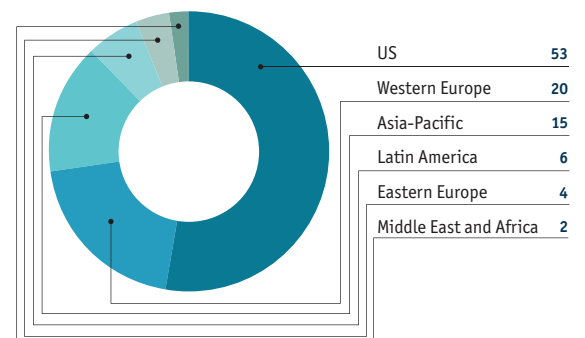
(% of respondents)



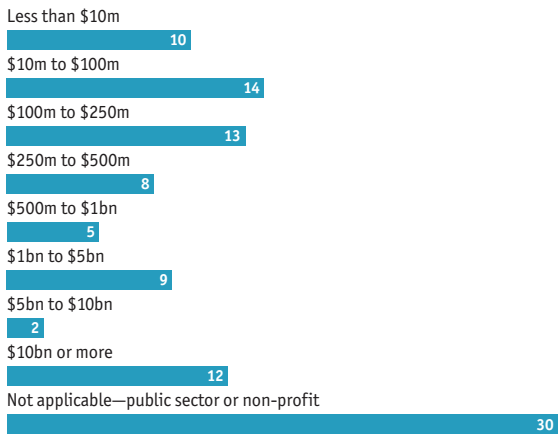
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**Where are you personally based?**

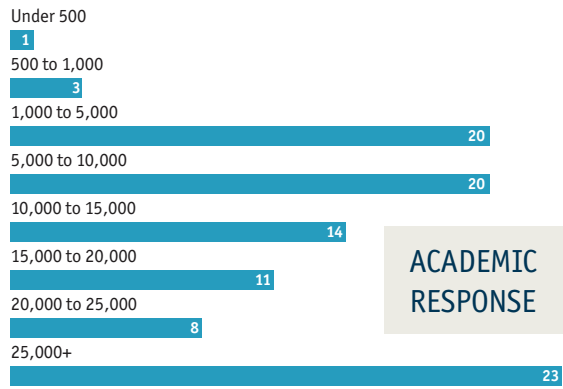
(% respondents)



**What is your organisation's global annual revenue in US dollars?**  
(% of respondents)

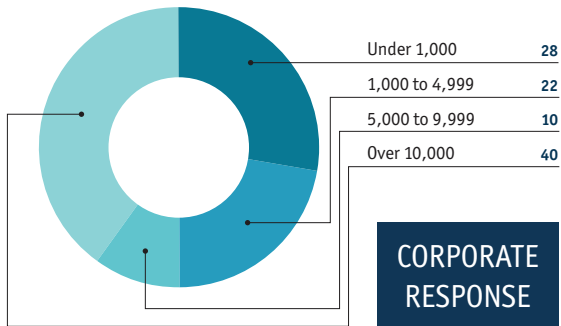


**How many students are enrolled at your institution?**  
(% of respondents)



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**How many people does your company employ?**  
(% respondents)



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Whilst every effort has been taken to verify the accuracy of this information, neither The Economist Intelligence Unit Ltd. nor the sponsor of this report can accept any responsibility or liability for reliance by any person on this white paper or any of the information, opinions or conclusions set out in the white paper.



LONDON  
26 Red Lion Square  
London  
WC1R 4HQ  
United Kingdom  
Tel: (44.20) 7576 8000  
Fax: (44.20) 7576 8476  
E-mail: london@eiu.com

NEW YORK  
111 West 57th Street  
New York  
NY 10019  
United States  
Tel: (1.212) 554 0600  
Fax: (1.212) 586 1181/2  
E-mail: newyork@eiu.com

HONG KONG  
6001, Central Plaza  
18 Harbour Road  
Wanchai  
Hong Kong  
Tel: (852) 2585 3888  
Fax: (852) 2802 7638  
E-mail: hongkong@eiu.com