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

Er. Manish Porwal Ujjain M.P.

Executive summary

Technological 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.

l   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.

l   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.

l   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 distractability, 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.will

s Introduction

No 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.

How technology is changing today's classrooms

Technology 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 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

More 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

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

In 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

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
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,

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.

Reference

1 Guy Neave and Frans Van Vught, (ed)"Conclusion," in Prometheus Bound: The Changing Relationship between Government and Higher Education in Western Europe,(Oxford: Pergamon Press,1991)239-55 16

 2 Robert Cowen, "Last Past the Post: Comparative Education, Modernity, and perhaps Post-Modernity, Comparative Education Review 32, no. 2 (1996): 151-70.]

3 John Smyth, "Globalization and Higher Education: What's Happening to Academic Work?" in Ninth World Congress on Comparative Education: Tradition, Modernity, and Post modernity (Sydney) Proceedings, 1996) and John Smyth, ed., Academic Work: The

Changing Labour Process in Higher Education (Buckingham: Society for Research into Higher Education and Open University Press, 1995

4 Guy Neave, "The Dark Side", Globalisation: Threat, Opportunity or Both, Report presented to the IAU Administrative Board Meeting at its Mexico City meeting in November 2001).

5 Guy Neave, "Globalisation: Threat, Opportunity or Both", Report presented to the IAU Administrative Board Meeting at its Mexico City meeting in November 2001).

6 WTO-Committee on Trade and Development, 77th Session, 21 and 25 November, 1994

7 . WTO Education Services, Background Nate by the Secretariat, 23rd September 1998.

8 UGC Annual Report, 2000-2001

9 For a list of these recommendations, as well as a progress report on action taken as of March 14, 2000, see http://www.mit.gov.in/atrnt.htm.

10 Figures from MBL Research and Consultancy Group, available online: http://asia.internet.com/cyberatlas /1012- india.html.

11 Philip G. Altbach, Higher Education and the WTO: Globalization Run Amok, Chronicle of Higher Education

12 . Open Doors 2004, Report on International Educational Exchange, Institute of International Education

13 World Bank, World Development Report 2000/2001: Attacking Poverty. (New York: Oxford University Press, 2001), p. 276 and p. 280. Telephone estimate from Financial Times