

E-learning in Tertiary Education

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Introduction

E-learning is becoming increasingly prominent in tertiary education, with universities increasing provision and more students signing up. But is it actually changing the way universities teach and students learn, or is it simply a case of students typing up their essays on computers and professors sending them course reading lists or work assignments by e-mail?

The vision common at the height of the dot.com boom of students following entire courses at a prestigious overseas university from the comfort of their own home, without the inconvenience and cost of living abroad for years has largely failed to materialise. Students are still mostly wedded to classrooms for at least part of the time, and after the hype of the new economy, growing disenchantment with e-learning has replaced earlier over-enthusiasm.

Failures of e-learning operations have, at least temporarily, overshadowed the prospects of widened and flexible access to tertiary education, pedagogic innovation and decreased cost, that e-learning once embodied. But universities are gradually bringing e-learning into the mainstream of their educational programmes, and it is often an integral part of a classroom-based course. Will this trend continue? How could governments and institutions help make further progress in e-learning and reap all its potential benefits?

To try to answer some of the questions raised, the OECD, in partnership with the UK-based Observatory on Borderless Higher Education (OBHE), carried out a survey of e-learning in 19 tertiary education institutions in 13 countries. The qualitative findings of the project were complemented by an OBHE survey of online learning in Commonwealth universities undertaken in 2004.

This Policy Brief looks at the results of these surveys, and likely future trends in e-learning at university. ■

What is e-learning?

E-learning refers to the use of information and communications technology (ICT) to enhance and/or support learning in tertiary education. But this covers a wide range of systems, from students using e-mail and accessing course work on line while following a course on campus to programmes offered entirely online.

E-learning can be divided into several different types. In all cases, a campus-based institution is offering the courses, but using e-learning tied to the Internet or other online network to a different extent.

Web-supplemented courses focus on classroom-based teaching but include elements such as putting a course outline and lecture notes on line, use of e-mail and links to online resources.

Web-dependent courses require students to use the Internet for key elements of the programme such as online discussions, assessment, or online project/collaborative work, but without significant reduction in classroom time.

In **mixed mode** courses, the e-learning element begins to *replace* classroom time. Online discussions, assessment, or project/collaborative work replace some face-to-face teaching and learning. But significant campus attendance remains part of the mix.

And when courses are offered **fully online**, students can follow courses offered by a university in one city from another town, country or time zone. ■

How fast is e-learning growing?

Student take-up of e-learning is growing, but at most campus-based institutions, whole programmes at the web-dependent and fully online end of the scale account for well under 5% of total enrolments. However, enrolments are difficult to track. In some institutions, the number of students enrolled in at least one course with a high online presence would typically be much higher, and sometimes from 30% to 50% of total enrolments.

The types of e-learning offered by universities range right across the e-learning spectrum, but in most campus-based institutions the growth of e-learning has not altered the fact that face-to-face classroom teaching remains central. Contrary to the predictions of the dot-com boom, distance online learning in general and cross-border e-learning by students outside the country where the institution's central campus is located have generally failed to emerge as significant activities. In most institutions, cross-border enrolments for e-learning are a small-scale, peripheral activity.

Most e-learning activity is related to modules, or segments, of a course, reflecting the dominance of e-learning as supplementary to on-campus delivery at undergraduate level. Whole award programmes with relevant online presence were more common at postgraduate level, maybe because online education favours the experienced learner wanting to combine work/family and study. The intensity of online learning also varies significantly across disciplines: IT and business/management emerged as the most commonly cited disciplines making significant use of some form of e-learning, particularly in the mixed mode and fully online categories.

But even if e-learning is proving slow in terms of take-up, institutions clearly feel they should be offering it. Almost all institutions studied have some form of central strategy for e-learning or were in the process of developing one. In 2004, only 9% of 122 Commonwealth institutions responding to the OBHE survey lacked

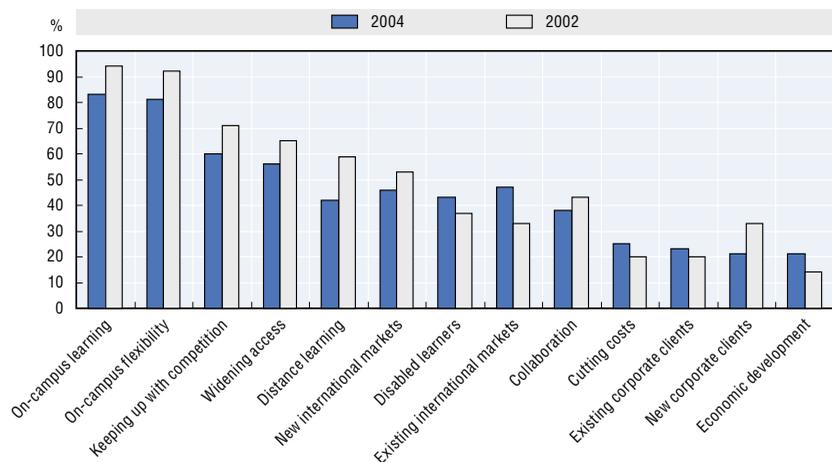
an institution-wide online learning strategy or plans to develop one, down from 18% in 2002.

Fully online provision at campus-based institutions will remain very much a minority in the short to medium term. Universities are more interested in improving their on-campus programmes by using e-learning to offer increased flexibility and content. They express relatively little interest in using e-learning to develop international and new markets or to cut costs by reducing the classroom element of their courses. Indeed, distance learning declined significantly as a reason cited by educational institutions for developing e-learning strategies between 2002 and 2004 (Figure 1).

Institutions worldwide have adopted learning management systems (LMS) – software developed for administration and teaching in tertiary education. This software enables them to treat enrolment data electronically, offer electronic access to course materials and carry out assessments, for example, as well as offering online interaction between faculty and students. But there is still a gulf between LMS adoption – which is too often equated to e-learning – and its use for teaching: while 73% of OBHE respondents reported LMS adoption, 76% cited no, trivial or modest online presence.

While the two leading commercial vendors of LMS software (Blackboard and WebCT) have attained significant market share, development of in-house software and the use of “open source” software freely available to all are noteworthy trends at tertiary institutions. The appeal of in-house/open source software sometimes lies in perceived inadequacies of commercial offerings, plus a desire to retain institutional autonomy over the instruction process, especially as it can represent valuable intellectual property. Although the multiplication of software platforms for e-learning reflects the novelty, relative immaturity and dynamism of LMS, it might also represent a wasteful duplication of effort. It might also correspond to an over-emphasis on the technological infrastructure when the real challenge could lie in making innovative and effective use of the functionalities offered to faculty and students. The pedagogic impact and institutional take-up of new and prominent open source platforms (e.g. Moodle, Sakai, and LAMS) remain unclear. ■

Figure 1.
COMPARISON OF
“KEY RATIONALES”
IN INSTITUTIONAL ONLINE
LEARNING STRATEGIES
IN 2004 AND 2002



Source: OBHE.

How to encourage academics and students to make better use of e-learning?

Tertiary education institutions generally feel that e-learning has a broadly positive effect on the quality of teaching and learning, although few have been able to offer detailed evidence. There is much indirect evidence, including student satisfaction surveys, but these may not be enough to offset the prevalent doubt about the pedagogic value of online learning among students and academics.

One reason for the scepticism probably lies in the fact that e-learning has not really revolutionised learning and teaching, although it already offers fascinating experiments (see Box 1). The current immaturity of online learning is demonstrated by low adoption of content management systems, where electronic content is split into “learning objects” that can be manipulated and recombined for multiple pedagogic purposes: only 6.6% of the OBHE respondents reported institution-wide adoption in 2004.

The “learning object” model is perhaps the most prominent “revolutionary” approach to date. A learning object can be described as an electronic tool/resource that can be used, re-used and re-designed in different contexts, for different purposes and by different academics/actors. Sample institutions expressed considerable interest in this model but were also faced with a range of primarily cultural and pedagogical challenges hindering widespread adoption. These included faculty unwillingness to use third party materials, as well as re-use and copyright concerns. Although institutions pay a lot of attention to learning objects, they still consider them as immature tools.

In fact, ICT has had more impact on administrative services such as admissions, registration, fee payment and purchasing than on the fundamentals of classroom teaching and learning. But even if ICT has not revolutionised the classroom yet, it is changing the learning experience of students by relaxing time and space constraints as well as providing easier access to information (online journals and e-books; student portals; etc.) – an achievement that should not be downplayed.

Box 1.

ADVANCED E-LEARNING AT CARNEGIE MELLON UNIVERSITY

The Open Learning Initiative (OLI) which started in the autumn of 2002 at the US-based Carnegie Mellon University is a good example of the promises of e-learning to enhance the outcomes of learning. OLI courses include a number of innovative online instructional components such as: cognitive tutors; virtual laboratories; group experiments; simulations. But its specificity lies in the initial development of each course guided by both cognitive theory and faculty expertise. As the courses are delivered, OLI researchers conduct a variety of studies to examine the effectiveness and usability of the learning objects. The research results are then used to improve the courses as well as to contribute to a growing understanding of effective practices in online learning environments. As of December 2005, seven subject areas are covered at the introductory university level: Causal and Statistical Reasoning, Statistics, Economics, Logic, Biology, Chemistry and Physics. They are freely available through the OLI Web site: www.cmu.edu/oli.

Carnegie Mellon also experiments a “Story-Centred Curriculum” (SCC) approach to learning. The “Story-Centred Curriculum” allows students to learn through a simulated work environment and to learn to work collaboratively in virtual groups on authentic projects, with assistance from faculties and online tutors. The idea is that a good curriculum should consist of a story in which students play a key role (for example, manager of e-business technology or of software engineering) that the graduate might actually do in real life or might need to know about.

Universities are now thinking through and negotiating the potential contribution of e-learning to their organisational future. For some institutions, and in some countries, key barriers remain. Infrastructure and funding are among the important ones, but scepticism about the pedagogic value of e-learning and staff development are probably the most challenging. Institutions are grappling with bringing use and funding of e-learning into the mainstream of their organisation, and are beginning to contemplate restructuring to take account of e-learning, in terms of staffing, staff development, course design and student support. All institutions acknowledged the need to recruit a broader range of staff, such as technological experts, to complement academic staff. Another challenge is persuading current faculty members to use and develop e-learning. The general concept of “staff development” is widely seen as key to sustainable e-learning in tertiary education. Institutions are struggling with the division of labour between faculty members and “new” staff focussed on the technical aspects of e-learning. For most institutions, meeting these day to day campus-based challenges of e-learning is far more important, at least for the moment, than the commercialisation and internationalisation of e-learning.

Resistance to e-learning by faculty members may partly be due to their perceptions of the limitations of e-learning and the insufficient maturity of the tools available. But it can also be explained by a lack of time or motivation to carry out what is basically an additional task, since e-learning mostly supplements rather than replaces classroom-based teaching, coupled with insufficient literacy either in ICT in general or in e-learning applications. E-learning and the sharing of information it implies might also conflict to some extent with the professional culture of academics, based on autonomy and a reward system often based on research. Concerns about intellectual property rights may also pose a problem.

Building a community of e-learning adopters within and across institutions and, more generally, knowledge management processes related to e-learning, are clearly crucial for further e-learning developments. However, the scaling up of successful experiments and the sharing and mainstreaming of good practices remain the real challenges.

Partnerships are a key characteristic of e-learning that could help institutions to share knowledge, and good practices, and achieve benefits such as advanced technology and educational quality in addition to enhanced market presence and lower costs. Some institutions are already involved in partnerships covering activities such as e-learning infrastructure; learning management systems and applications; creating e-learning materials; developing joint programmes; joint-marketing; collaborating for research; sharing best practices; and sharing costs of hardware and software. But partnerships also raise potential issues. One is whether e-learning materials should be made available to third parties free or for a fee. Another is the attitude towards outsourcing of non-core e-learning activities. Tertiary education institutions see minimal or short-term value in outsourcing activity and rarely give strategic attention to making learning materials available to third parties. Partnerships and networking could still be used more effectively to enhance the diffusion of knowledge and good practices at the sectoral level. ■

Can online learning help cut costs?

During the dot-com boom, the promise of lower costs compared to conventional campus-based provision was one of the most frequently cited advantages of e-learning. It was argued that increased automation, reduced marginal costs, and lower travel and accommodation costs would all make e-learning less costly. But the travel and accommodation savings have failed to materialise, since the major impact of e-learning has been to supplement on-campus classroom activities. The idea that e-learning would make programmes less costly to develop and deliver has also been challenged by the high cost of software development and, in many instances, demand for face-to-face tutorial support for remote online activities. Finally, it has become clear that online learning involves significant, and ongoing, infrastructure costs. Even online applications for administrative purposes generally complement, rather than replace, traditional procedures, also preventing significant cost reductions.

Many universities still expect e-learning to help reduce costs, although few can offer direct evidence of this happening. The good news is that experienced institutions are generally optimistic about a positive cost impact of e-learning in the medium run. There are several possible ways for e-learning to become a less expensive model compared to conventional face-to-face or distance education: using some online provision to replace on-campus teaching, rather than duplicating it; facilitating increased peer/automated learning; using standard/pre-existing software; drawing on the open standards and learning objects model to increase material re-use and sharing; and greater course standardisation. In any case, re-organisation should involve a decrease in course development costs, an increase in the student/staff ratio or savings due to less use of facilities such as classrooms.

Internal resources currently represent the biggest source of funding for e-learning at most sample institutions, but much of its development has benefited from governmental and other non-commercial agency funding. No clear sustainable business model has yet emerged for commercial provision of e-learning, and failures have been more numerous than successes to date. Special internal or external funding remains a prominent feature of e-learning development in tertiary education. This stems from a perception of e-learning as a novel activity that merits experimentation and research. Many institutions are now trying to move to “normal” funding, often through a combination of mainstream internal funds and student fees, especially as external funding raises the problem of sustainability.

Cost is not the only concern, however. Can e-learning improve the quality of education on offer? The overall enhancement of the student experience due to online presence suggests that the answer is yes, which could be an argument to increase its use. ■

How to make further progress in e-learning?

State or national governments play a significant role in the strategic direction and funding of higher education and of e-learning in all OECD countries. Even in countries where institutions have significant autonomy and governments are not expected to play a direct part in institutional management, governments influence the behaviour of institutions by means of strategic funding or policy. What can governments do to create an environment enabling e-learning to develop and to reap all its benefits?

Given that e-learning is still a novel activity and that it has already improved the overall student experience, albeit primarily outside the classroom, there is a case for continued government funding. However, governments and institutions need to have a clearer understanding of the costs and benefits of e-learning. While e-learning could help both to reduce costs and to improve the quality of education on offer, these are two very different policy agendas. E-learning can be used to improve distance learning and increase access to and participation in tertiary education, as part of a lifelong learning policy. It can also be used to enhance the student experience on campus. These are again two distinct worthwhile agendas. One prerequisite for better understanding the benefits of e-learning would be to disentangle the different activities covered by the concept of e-learning and assess them separately.

In some countries, notably emerging economies, the basic infrastructure still needs further development and governments need to focus on this. In the developed world where the infrastructure is in place, governments now need to focus on the “softer” social, organisational and legal aspects in order to foster the further development of e-learning.

The priority now is to find a way to mainstream e-learning and maximise its impact in the classroom. E-learning tools are available; the problem is that students and faculty do not use them enough, often simply through ignorance. Indeed, practical and experimental knowledge of e-learning is too often scattered within and across institutions, so that even successful practices and interesting experiences have limited impact and visibility.

In brief, better knowledge management has become crucial for e-learning. Governments could help by:

- Encouraging the dissemination of good practices to stimulate innovation, avoid wasteful duplication of efforts, and scale up successful experiments.
- Encouraging appropriate staff development, in order to ensure progress at institutional level.
- Supporting research and development on learning objects and other promising innovations such as open educational resources or the use of virtual simulation tools, and ensuring their relevance for students and faculty.
- Exploring the issues surrounding intellectual property in e-learning.
- Promoting a dialogue between IT providers and institutions, and supporting public-private partnerships, in order to keep costs at a reasonable level.

In designing policies, governments should take into account the importance of academic autonomy and avoid micro-managing change. The active engagement of institutions is indeed vital for further growth of e-learning. Most importantly, governments (and institutions) should adopt a suitable timeframe for development: patience is key to any capacity-building policy. E-learning could then be well-placed to transform tertiary education for the better in the long run. ■

**For further
information**

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