

Conclusion

E-learning is becoming increasingly prominent in tertiary education. All available evidence points toward growing enrolments and provision albeit from a low starting point. However, after the hype of the new economy, growing disenchantment with e-learning has replaced 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 was once embodied by e-learning. So where do we stand after the end of the hype of the new economy? What are the next steps to move e-learning forward in tertiary education and to reap its potential benefits?

Activities and strategies

What do we know about e-learning adoption and enrolments as well as the institutional strategies of tertiary education institutions?

First, although student take-up is growing, enrolments are relatively low at most campus-based institutions and represent a small share of total enrolments. On the available quantitative evidence, provision with “high” online presence (that is with at least “web dependent” online presence) accounted for well under 5% of total enrolments at most OECD/CERI sample institutions. However, it should be noted that enrolments are currently difficult to track, not least because e-learning enrolments were often located at credit rather than degree level: in some institutions, the number of students enrolled in at least one course with high online presence would typically be much higher, and sometimes from 30 to 50% of total enrolments.

Second, e-learning activities across tertiary education institutions are very diverse, with programmes located at different points of the e-learning spectrum ranging from none or trivial online presence to fully online provision. The diversity found within the case study institutions matched the diversity found on a larger scale by the Observatory survey. In most campus-based institutions, the growth of e-learning to date has not challenged the centrality of the face-to-face classroom setting. Contrary to

the predictions of the dot-com boom, distance online learning in general and cross-border e-learning in particular (*i.e.* programmes taken by students in a country other than where the institution's central campus is located) have generally failed to emerge as significant activities or markets to date. A small number of OECD/CERI respondents reported significant general cross-border enrolments, and the Observatory data reinforced the view that in most institutions this form of activity is small-scale, peripheral and poorly tracked centrally. The complex possibilities of remote international delivery were typically left to small-scale, department-led experiments.

Third, modules (or courses) accounted for the majority of e-learning activity, 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. This is in line with the view that e-learning 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 that make significant use of some form of e-learning (notably the mixed mode and fully online categories).

How should this relatively low level of online learning be interpreted? It should certainly not be interpreted as the result of a lack of institutional interest in online learning. Almost all OECD/CERI sample institutions reported some form of central strategy for e-learning or were in the process of developing one. More representatively, only 9% of the 2004 Observatory survey respondents indicated neither any form of institution-wide online learning strategy nor any initiative under development – a decline from 18% in 2002. Should the discrepancy between institution-wide strategy and institution-wide use be interpreted as a sign of the immaturity of e-learning that will be overcome over time? Only partially. Current institutional strategies do not back the assumption that tertiary institutions will gradually move their provision towards fully online delivery. The OECD/CERI and Observatory surveys clearly demonstrate that fully online provision at campus-based institutions will remain very much a minority in the short to medium term. Consistent with their current activities, institutions' dominant rationales for e-learning strategies at campus-based institutions centred on on-campus enhancement through increased flexibility of delivery and enhanced pedagogy. Both the OECD and Observatory surveys found relatively little interest in international and new markets and in cost reduction. Virtual and distance-learning only institutions pointed to the greatest extent in this direction (but not all to the same extent). Distance learning declined significantly as a cited rationale between 2002 and 2004 in the Observatory survey.

Pedagogic, organisational and technological challenges

One of the strongest arguments for promoting e-learning lies in its potential to improve and even revolutionise teaching and learning. The overwhelming view of respondents of the OECD/CERI survey was that e-learning has had a broadly positive pedagogic impact. However, few were able to offer detailed internal research evidence to this effect. Indirect evidence, including student satisfaction surveys and retention/attainment data, were widespread but these data may not be compelling enough to convince the bulk of sceptical students and academics of the pedagogic value of online learning.

One reason for the scepticism probably lies in the fact that e-learning has not really revolutionised learning and teaching as promised. Far-reaching, novel ways of teaching and learning, facilitated by ICT, remain nascent or still to be invented. 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. Redesign – for example through the use of pre-existing software, third party materials, peer/automated feedback, etc. – appears to be crucial for e-learning to reap the key pedagogic benefits (and cost efficiencies). 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 tensions between the decontextualised object and the contextualised learning encounter/programme, faculty unwillingness to use third party materials and object access as well as re-use and copyright concerns. Although the OECD/CERI survey reveals that institutions pay a lot of attention to learning objects, they still consider them as immature tools. At present, it appears that e-learning is continuing to grow in scale and significance in the absence of an explicit learning object economy. This partly reflects the influence of a “conventional” course development paradigm, but is also indicative of infancy (and thus poor utility) of any such economy – a situation that may change over time.

The limited impact of ICT in the classroom setting to date cannot be imputed to a limited usage of ICT in the tertiary education sector, as was often the case in the early 1990s. The adoption of learning management systems (LMS) – that is software designed to provide a range of administrative and pedagogic services related to formal education settings (*e.g.* enrolment data, access to electronic course materials, faculty/student interaction, assessment, etc.) – appears to be one of the prominent features of e-learning development in tertiary education worldwide. This is clearly

illustrated by both OECD/CERI and Observatory findings. The current immaturity of online learning is demonstrated by low adoption of content management systems – that is software where electronic content is split into learning objects that can be manipulated and recombined for multiple pedagogic purposes: only 6.6% of the Observatory respondents reported institution-wide adoption in 2004. ICT has penetrated tertiary education, but has had more impact on administrative services (*e.g.* admissions, registration, fee payment, purchasing) than on the pedagogic fundamentals of the classroom.

All sample institutions reported significant and ongoing investment in IT networks to support on-campus activity and/or distance learning, and many reported adequate functionality. But the Observatory data show a widespread need for urgent technology upgrades. At the sample institutions where functionality was largely appropriate, development plans relating to IT infrastructure concentrated on extension of services (*e.g.* wireless) operation-wide, bandwidth management (to both offer sufficient capacity to accommodate greater use of audio and video, but also to manage student use) and overall quality/range of service (online journals and e-books; student portals; etc.). The limited impact of IT in the classroom seen to date should not be dismissed as a lack of innovation or change in tertiary education as a whole: even if IT does not induce any change in the classroom, it is changing the learning experience of students by relaxing time and space constraints as well as providing easier access to information and greater flexibility of participation.

While the two leading commercial vendors of LMS software have attained significant market share, development of in-house software and use of open source software are noteworthy trends at tertiary institutions, typically among dedicated virtual, mixed mode and distance institutions. Several sample institutions reported an ongoing search for an alternative platform to the one they currently use, and were attracted to in-house and open source models. The appeal of in-house and open source sometimes lies in perceived inadequate functionality or pedagogic limitations of commercial offerings, despite platform functionality becoming increasingly customisable. The study demonstrates a willingness to maintain institutional autonomy over processes that are increasingly at the heart of instruction, especially as they can represent valuable intellectual property. Although the multiplication of platforms typically shows the novelty and relative immaturity of LMS, it might also represent a wasteful duplication of effort. Furthermore, it might also correspond to an over-emphasis on the technological infrastructure when the real challenge could lie in the 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.* Sakai and LAMS) remain unclear.

All sample universities are in the midst of thinking through and negotiating the potential contribution of e-learning in its various forms to their organisational future. For some institutions, and in some countries, key barriers remain. Infrastructure and funding are among the important ones, but stakeholder scepticism about the pedagogic value of e-learning and staff development are probably the most challenging. Institutions are commonly grappling with mainstreaming adoption, mainstreaming funding and are beginning to contemplate restructuring in terms of staffing, staff development, instructional design and student support. All institutions acknowledged the need to recruit a broader range of staff to complement academic staff, such as technologists, instructional designers, learning scientists, etc. Another challenge, however, lies in engaging current faculty to use and develop e-learning. The general concept of “staff development” is widely seen as key to mainstreamed and sustainable e-learning in tertiary education. Institutions are struggling with the balance between faculty and “new” staff roles, and the division of labour between the two. Interestingly, commercialisation and internationalisation were infrequently cited as aspects of organisational change.

While faculty resistance can partially be imputed to (at least perceived) pedagogic limitations of e-learning and insufficient maturity of the tools, it can also be explained by a lack of time (or motivation) to carry out what is foremost an additional task, by insufficient ICT literacy, or insufficient pedagogical literacy related to e-learning. E-learning development, with its standardisation aspects, 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 (and shared rights between faculty, institutions and technologists) may also be seen as a barrier for e-learning development. The sample institutions illustrate a diversity of methods for developing institutional human resources. 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. The development of faculty-led initiatives appeared to be an important ingredient for success at many sample institutions. However, the scaling up of successful experiments and the sharing and mainstreaming of good practices remain the real challenges. Just as there is no one “best model” or trajectory for e-learning development for institutions, nor is there a “one-size-fits-all” staff development model for mainstreaming e-learning.

Partnerships are certainly a key characteristic of contemporary e-learning that could help institutions to share knowledge, good practices,

and achieve benefits such as advanced technology and quality curricula and pedagogy, in addition to enhanced market presence and lower costs. At the sample institutions, partnerships encompassed activities such as building the infrastructure; developing 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 the arrangement under which e-learning materials should be made available to third parties (free or fee-based use?). Another is the attitude towards outsourcing of non-core e-learning activities. The OECD/CERI survey found that the tertiary education institutions saw minimal or short-term value in outsourcing activity and that making learning materials to third parties was rarely given much strategic attention. Partnerships could still be used more effectively to enhance sectoral organisational learning.

Cost and funding

During the dot-com boom, the promise of lower programme development and delivery costs (compared to conventional campus-based provision) was one of the most frequently cited advantages of e-learning in tertiary education and beyond. It was argued that lower costs would result from increased automation of development and delivery processes, reduced marginal costs, and the removal/reduction of travel and accommodation costs. The approach of the industrial era could at last be applied to education, with rationalised materials development, reduced number of full-time faculty, higher staff/student ratios, etc. Given that the major impact of e-learning has been on-campus where it acts as a supplement to classroom activities, most direct travel/accommodation savings have been factored out. Even online applications for administrative purposes seem to typically complement rather than substitute for traditional procedures – also undermining significant cost reductions. Lower development/delivery costs have 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 will induce ongoing and significant infrastructure costs. This implies that many conditions that could lead to a higher cost-efficiency of e-learning compared to conventional learning are not met. In this context, reducing overall teaching costs appears as a crucial component of the equation.

While a number of respondents expressed positive expectations about the cost reduction potential of differing forms of e-learning, few were able to offer direct evidence of this impact. However, in many instances, institutions would have as much difficulty evaluating the cost of traditional education. The conditions under which e-learning could become a less

expensive model compared to conventional face-to-face or distance education may come from a number of different sources: substituting some online provision for on-campus (rather than duplicating it), facilitating increased peer/automated learning, use of standard/pre-existing software, drawing on the open standards and learning objects model to increase material re-use and sharing, avoidance of duplication of effort, and greater course standardisation. In any case, re-organisation should involve a decrease in course development costs, a decrease in the student/staff ratio or savings due to less facility use (*e.g.* classrooms). Norms on class size and course design still appear as major barriers.

A strong theme was a call to evaluate e-learning in pedagogic as well as cost terms: e-learning could indeed prove to be more cost effective than face-to-face education (rather than more cost-efficient). The overall enhancement of the student experience due to online presence supports the argument, but pleading cost effectiveness would be pleading a different case – although one that should not necessarily be dismissed.

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 (rather than from tuition fees). 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 clearly attempting to move to “normal” funding, typically through a combination of mainstream internal funds and student fees (balance depending on the type of programme and the country concerned), especially as external funding raises the problem of sustainability.

Policy challenges

In all OECD countries (and in all countries where institutions are based), state/national governments play a significant role in the strategic direction and funding of higher education in general, and e-learning in particular. Even in countries where institutions have significant autonomy and governments are not expected to play a direct part in institutional management, governments play an important role in influencing the behaviour of institutions by means of strategic funding/policy. What can governments and related agencies do to create an enabling environment for e-learning development and to reap all its benefits?

In some countries, notably those in emerging economies, the basic infrastructure still needs further development and governments need to focus

on this structural investment, directly or indirectly. In the developed world, government investment in infrastructure was widely praised. However, rather than lacking the technological infrastructures necessary to fully embrace the advantages of e-learning, countries now need development and changes within the “softer” social, organisational and legal contexts in order to foster the further development of e-learning. This is where governmental policies should now focus.

Building a framework that would help shift e-learning to the mainstream and maximise its impact in the classroom is the current priority. 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.

Given that e-learning is still a novel and immature activity and that it has already improved the overall student experience (first and foremost through administrative rather than pedagogic changes), 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. For example, while e-learning could incur both cost reduction and enhanced quality, the two underlying agendas might not be similar.

In brief, a better knowledge management has become crucial for the advancement of e-learning. Governments could thus:

- Encourage the dissemination of good (and lessons from bad) practices to stimulate innovation, avoid wasteful duplication of efforts, and scale up successful experiments.
- Encourage appropriate staff development, collective as well as individual, in order to ensure progress at institutional level.
- Support research and development on learning objects and other promising pedagogic innovations.
- Against the background of uncertainty about best practices, explore the issues surrounding intellectual property in e-learning.
- Promote a dialogue between IT providers and institutions, and support public-private partnerships, in order to keep costs at a reasonable level.

In designing their policies, governments should take into account the importance of academic autonomy and diversity and avoid micro-managing change. Most importantly, they should adopt a suitable timeframe for development: patience is a key condition to any capacity building policy. E-learning could then be well-placed to transform tertiary education for better in the long run.