

The Long-Awaited Breakthrough?



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Introduction

This MERLOT conference is about the creation, use, re-use and customisation of learning objects. This sounds like an esoteric and highly specialised topic of little interest to ordinary people - even ordinary educators. I disagree. I believe you have the potential to create a revolution in education worldwide. Thank you for the invitation to come and tell you why I believe that and why I am ready to embarrass conservative people like yourselves by calling you revolutionaries!

I have entitled this keynote address *The Long-Awaited Breakthrough* because I believe that the combination of rapidly increasing connectivity across the world and the emergence of the concept of re-usable learning objects - specifically open educational resources - have tremendously hopeful implications for humankind.

I have prepared this address with the help of three co-authors who are particularly well placed to understand and promote the global significance of learning objects.

My first co-author is Susan D'Antoni of UNESCO's International Institute for Educational Planning. Through the virtual forum that she has organised on virtual universities and similar events that she is planning for the future Susan is helping to create a global community of practice in eLearning.

Stamenka Uvalić-Trumbić, my former colleague at the UNESCO Secretariat in Paris, heads UNESCO's unit that deals with reform, innovation and quality assurance in higher education. Most recently she has guided the joint work of UNESCO and the OECD on the development of guidelines for the quality assurance of cross-border higher education. eLearning will become an important manifestation of cross-border education.

My third co-author is Paul West, my colleague at the Commonwealth of Learning who looks after our work in knowledge management. One of Paul's objectives is to help people in developing countries use

eLearning to expand the scope, scale and impact of education and training. For this reason he is particularly interested in getting MERLOT to cooperate with GLOBE and include the developing world in contributing to the global interoperability of learning objects. In practical terms this means making learning objects available by caching them on local servers, something that goes beyond the present stage of development of learning object repositories.

The four of us are united by a common aim, which is to promote development through learning. Eradicating the grinding poverty that scars much of our contemporary world is not a simple phenomenon. However, education and training is a major part of the solution and we believe that the sharing of learning objects could help those countries leapfrog over some of the stages through which education has developed in countries like the United States. We shall focus on higher education not because we consider it is necessarily the most important level of education but because we believe that creating a culture of re-use of learning objects in higher education will have an exemplary effect on education systems as a whole.

We shall begin by outlining the challenge of making higher education available to people everywhere. Remember as we do so that the challenges at other levels of education - those that you refer to as 'compulsory education' in developed countries - are even greater. Second, we shall ask the crucial question for this conference. Can eLearning help us rise to this challenge? Success in higher education will have an exemplary influence on other levels of education. Third, we shall examine the barriers to the development of eLearning and suggest how governments, institutions and individuals can combine forces to overcome them. Fourth, we shall urge you to be partners in this endeavour and help to lead the world to a better future.

I suspect that most of you do not need convincing that you have a duty to help the developing world. If you are sceptical, simply reflect on your unrelenting recruitment of teachers, lecturers and scientists from developing countries. African immigrants in the USA have a highly-educated profile and many of the scientists and leading edge knowledge workers who appear as experts on TV in industrialised countries are immigrants. Something needs to be repaid and the joint creation of learning objects could be a small contribution for the benefits already gained by industrialised countries.

Growing Demand for Post-Secondary Education

We start with the major global trend in post-secondary education, namely growth in demand. UNESCO's 1998 World Conference on Higher Education (WCHE) brought four thousand participants from 182 countries together for a comprehensive policy debate (UNESCO, 1998). They found that higher education needed radical renewal but a follow-up conference in 2003 found that even the startling changes forecast in 1998 underestimated the task ahead (UNESCO, 2003).

For developing countries the challenge begins, as usual, with demography. Forecasts indicate a population of 7 - 8 billion people in the developing world in 2025 - more than half of them young people. We have already crossed the threshold of 100 million post-secondary students worldwide, and numbers are forecast

to grow to 125 million before 2020. But this may be too modest. China, the USA, India, Russia and Japan already have 53.1 million students between them.

Today there is a huge discrepancy between the proportions of people in developing and developed countries who have access to higher education. 40-50% age participation rates (APRs) are becoming the norm in developed countries, whereas they remain below 5% in some sub-Saharan African countries. Yet all indications support the statement that "...at no time in human history did the welfare (or poverty) of nations depend in such a direct manner on the quality and outreach of higher education systems and institutions" (UNESCO, 2003). The citizens of developing countries want post-secondary education and their governments see it as essential for closing the gap with the rich world by tackling the challenges of globalisation.

In this context new providers of post-secondary education are proliferating. They include new campuses of existing institutions, IT companies delivering courses and certificates, for-profit providers and corporate universities. Some of these operate across national borders through eLearning. However, in a recent study we found that cross-border post-secondary education is, for the moment at least, a negligible phenomenon in developing countries (Daniel, Kanwar and Uvaliæ-Trumbiæ, 2005).

This means that developing countries must rely mainly on home-grown solutions to expand post-secondary education. But this does not, of course, exclude partnerships amongst academic equals. American institutions could look where their immigrant lecturers and doctoral students come from and try to form constructive and equal partnerships with those countries. I emphasise the word 'equal'. Developing countries don't want more parentalism.

Can eLearning provide the radical reconfiguration of the key variables of capacity, quality and cost that is needed? That is the key question. Can digital divide become digital dividend - and, if so, how?

We link this to the wider challenge of improving the quality of life of the world's poorest people that has been taken up by C.K. Prahalad and his colleagues (Prahalad, 2004). Addressing themselves to multi-national corporations, they draw attention to the four billion poor people at the bottom of the world economic pyramid who aspire to better lives.

They urge corporations to look at their globalisation strategies through a new lens of inclusive capitalism since, 'for companies with the resources and persistence to compete at the bottom of the world economic pyramid, the prospective rewards include growth, profits and incalculable contributions to humankind' (Prahalad & Hart, 2002).

What would be the implications of expanding higher education amongst these four billion people? An APR of 35% within this group would yield 150 million students, far more than total current enrolments worldwide. Higher education would, however, face the same challenges as business in serving this clientele. It would require 'radical innovations in technology and business models'; changing from the ideal of "bigger is better" to 'an ideal of highly distributed small scale operations married to world-scale

capabilities' and 'helping people improve their lives by producing and distributing products and services in culturally sensitive, environmentally sustainable and economically profitable ways' (Pralhad & Hart, 2002).

Is eLearning the Solution?

Can eLearning respond to such a challenge, or is it just another over-hyped but underperforming example of the illusion that technology can transform education? In their study of the experience of eLearning in American higher education Zemsky and Massy (2004a, 2004b) concluded that eLearning has not yet proved to be the map to the buried treasure. They urged the eLearning community to talk less and do more, in particular to effect the fundamental changes in pedagogy without which eLearning will not achieve its potential.

The potential of the technology, most especially the growing availability of Internet connections, is clear. Such communication links are changing the way that poor villages in the developing world function. The question is whether we can organise ourselves effectively to take advantage of this technological opportunity. MERLOT is a step in the right direction. The most promising innovation in eLearning is the concept - and the developing reality - of open educational resources (OERs). The term refers to open course content, open source software and tools. Essentially OERs apply to teaching and learning the basic principle of sharing that underpins academic research.

Distance educators have talked for years about sharing courseware. The reality has disappointed. One reason is the 'not-invented-here' syndrome that reinforces the immune systems of academic institutions. Other reasons limiting courseware exchange have been copyright and the sheer difficulty of sharing and adapting learning materials that are not in digital formats. Open educational resources could overcome that difficulty and also reduce concerns that the course was not invented here. OERs make it possible to share and adapt courseware on a more equal basis but this will not be automatic. All players in the eLearning enterprise must work at creating a culture of equality. I urge MERLOT to take the lead in encouraging global cooperation in the creation and sharing of learning objects.

Re-usable learning objects are the equivalent of the published papers on which subsequent researchers can build. However, we would need a much more fully connected system of repositories for learning objects than the highly stratified system of journals for research publication. But if providers of higher education could successfully combine connectivity and shared courseware into a new business model they could massively increase access.

eLearning: the Four 'A's

What is required for this to happen? Potential learners ask four questions about the usefulness of eLearning for post-secondary education, continuing education or professional training (D'Antoni, 2002).

Is it accessible?

For eLearning to have any impact it must be accessible to the learner. In extending eLearning to developing countries the first priority is provide ready Internet connectivity. The second imperative is to make OERs more accessible and to expand their numbers. MERLOT has made an excellent start in the USA.

The OECD and UNESCO are promoting accessibility by mapping OER initiatives in a number of countries. UNESCO's IIEP supports an international Community of Interest on free and open source software for eLearning, and is currently planning a new forum on OERs, specifically on open content. This will link interested parties in both developing and developed countries in order to explore and discuss concerns and constraints associated with the provision and use of open content and propose ways to address them. The interaction and supporting documents will be organized for easy review on the IIEP web site.

Easy access to information about available open content or re-usable learning objects is essential if they are indeed to be re-used. COL has tackled the problem of accessing multiple learning object repositories (LORs) when connectivity is poor and surfing from one LOR to another is time-consuming. The software is a combination of eRIB, a product of Canada's Canarie eLearning project, and pakXchange, an open source product from the private sector. The outcome is free open source software with database and security features that enable the creation of multiple libraries of learning content, multiple contributing institutions and multi-level security. This can be downloaded the COL website at www.col.org/lor.

Because they have limited connectivity institutions in developing countries must have their learning management system available on their local area network so that it is readily accessible from computer labs on campus. The development of the ability to replicate the content of repositories locally is still on the wish-list and will depend not only on funding, but also on the ability of all parties to agree on the relevant standards.

Is it appropriate?

Once eLearning is accessible, is what it offers appropriate? Does it help to address the key challenges facing higher education in the country? In developing countries this may be a dire shortage of academic staff to teach in the classroom. Does the content fit learners' needs and does it respect their cultural context? Few subjects and delivery methods are universally appropriate. However, OERs allow learning materials to be made appropriate by local adaptation.

Expanding the provision of OERs requires building up the confidence of users. Those who seek to adapt re-usable learning objects for their own teaching must have the experience of finding good and appropriate material rapidly and conveniently. Increasing the volume, appropriateness and quality of OERs also requires a solid understanding of copyright, where the general rule is that "you can give away or sell what you own, but do not give away things you do not own".

COL is working with Commonwealth experts to provide synthesised information on copyright in education to governments, institutions and the World Intellectual Property Organisation (WIPO). The aim is both to encourage copyright compliance and to overcome barriers to using content for educational purposes. Developing countries are spending millions of dollars needlessly on copyright clearances because they are unaware of the educational exemptions that exist. At COL we are alerting them to the ways that they can save money perfectly legally.

Is it accredited?

In cross-border eLearning accreditation is a key concern. Accreditation in the country of origin is one indicator of quality and provides some consumer protection. However, learners' own countries must recognise the credential for it to be useful. What impact, if any, will OERs have on quality and accreditation?

Can the quality of eLearning be assessed using criteria already in use or does it need new models and approaches? This is a simple but important question. A survey of quality assurance in the large distance teaching universities with more than 100,000 students that are known as mega-universities (Daniel, 1999) revealed that they were applying to eLearning the criteria already in use for their other distance learning courses (Jung, 2005). Furthermore the well-developed quality assessment system for post-secondary education in the UK uses the same approach for all institutions, including the UK Open University. This suggests that quality criteria can be valid across the spectrum of post-secondary education.

What can we do at the international level to promote trust and confidence in post-secondary eLearning? How can we develop the skills of quality assurance amongst providers and regulators and empower learners to assess the quality of eLearning, particularly for cross-border provision?

The UNESCO-OECD Guidelines on Quality Provision in Cross-Border Higher Education are an encouraging response to these questions because they promote mutual trust and international cooperation in quality assurance and the recognition of qualifications. They reinforce the key principle that providers and receivers of post-secondary education share the responsibility for its quality. To protect students the guidelines call for partnership between six stakeholders: governments, institutions and their staff, quality assurance agencies, student associations, professional groups, and qualification-recognition bodies (www.unesco.org/education/amq/guidelines).

The essential condition for making this partnership successful is dialogue based on shared access to transparent and reliable information. The guidelines stress the role of national priorities as the basis for post-secondary education policy in cross-border education in general and eLearning in particular.

To help build capacity in quality assurance UNESCO is developing a Higher Education Open and Distance Learning Knowledge Base that makes available regional databases on post-secondary open and distance learning in Africa, Asia/Pacific and the CIS and Baltic States. These databases are linked to a

search tool on the main UNESCO site using the Commonwealth of Learning's Knowledge Finder and a common taxonomy with the Global Distance Education Network (GDENet). In addition, a decision-support tool addresses key questions about quality assurance in open and distance learning (www.unesco.org/odl). The development of this decision-support tool was itself a nice example of working across borders to provide education through technology. The technical work was done by the South African Institute for Distance Education while the content was provided by the Indonesia's Universitas Terbuka working in electronic consultation with a virtual advisory board (Varoglu, 2005).

Is it affordable?

Finally, to come to the fourth 'A', is eLearning affordable to the many? If the opportunities eLearning offers are not affordable in local contexts the digital divide will not be transformed into a digital dividend. Can OERs make the difference? Because of their digital formats they certainly have the potential to do so. It all depends on whether the current enthusiasm for OERs is sustained amongst both providers and users - and on whether the two groups quickly merge into an OER community of mutual give and take.

Answers to these four questions are vital because not everyone welcomes eLearning. In a recent pilot project the Maghreb countries dismissed all forms of eLearning as not providing quality education and excluded them from regulatory frameworks for the recognition of qualifications in Algeria, Tunis and Morocco (UNESCO, 2005). But despite such holdouts expanding higher education through ICTs and on-line provision is a global trend (Uvaliæ-Trumbiæ & Varoglu, 2003). Developing countries like Tanzania, Kenya, Nigeria and Iran see it as a way to meet growing demand while reducing the brain drain. Others follow South Korea in viewing the Internet as an economic motor.

Some governments and international organisations link eLearning to the development agenda, as in the cyber universities in South Korea, the Nigerian University Network and other virtual university initiatives such as the Virtual University for Small States of the Commonwealth. The creation of what they called the Virtual University for Small States of the Commonwealth was requested by the ministers of education of the 33 small countries that are part of the 53-member Commonwealth. They made the request at the height of the dot.com frenzy, fearful that their countries did not have the critical mass to be players in the world of eLearning. Their answer, which we are now beginning to implement, calls for small states to collaborate, through coalitions of the willing, to develop and share learning objects. This is a very good example of the potential of eLearning to promote national and regional development. (see: www.col.org/vussc)

I should add that at its next Pan-Commonwealth Forum on Open Learning, to be held in Jamaica at the end of next year, the Commonwealth of Learning will be offering a prize for a learning object that has been shared, adapted and used in at least three countries.

Removing the Barriers to eLearning

I now come to the third part of these remarks. What can the key stakeholders, namely governments, institutions and individuals like us, do to reduce or remove the barriers to eLearning? I have suggested that eLearning has the potential to create an educational revolution. What must we do to make it happen?

I start with the interests and roles of governments. National and state governments are attracted to eLearning, as to other applications of technology in post-secondary education, by the hope that it can increase access by promoting the three 'E's of efficiency, effectiveness and economy.

In recent decades, for example, numerous countries have greatly increased participation in post-secondary education through the creation of open universities. These institutions, like eLearning, combine technology with new forms of organisation (Daniel, 1999). ELearning could extend this revolution further because digital materials are much cheaper to copy, distribute, adapt and share than other formats. Even more importantly, well-designed eLearning can make the interactive aspects of teaching and learning, which are essential to the success of most students, more cost effective.

ELearning can support campus teaching as well as distance learning. This is important for developing countries because, although access to the Internet may be limited on campus, off campus it is often non-existent. Academics can put study material online for learners to access and, since institutions usually provide computer labs, students need not have their own computers. As one African academic said, "I did not have time to teach this in class, so I put it online and told the students to access it there. After they had studied it online we discussed it in class and saved time".

Institutions can also improve learner support by creating online discussions to give more time for debate and study. Moving some activities online and out of the classroom reduces demands on buildings, creating efficiencies in the use of plant that governments like to see.

If those are some of governments' interests in eLearning, what should they do to advance them? Are there actions that they should not take? Failed projects like the UK's e-Universities venture suggest that governments and their agencies should not operate eLearning programmes except for direct governmental functions like offering instruction about the Highway Code. Governments' role is to create the context and frameworks in which eLearning can flourish. This is a crucial task in developing countries, where the context for eLearning is usually unfavourable, but it can also be helpful in rich countries too. In Canada, for example, the federally-funded programme CANARIE has done much to advance eLearning across the country.

Creating the Infrastructure

A first role for governments is to facilitate the creation of the infrastructure that needs to be centralised. This is particularly important for advancing eLearning in K to 12 or compulsory levels of education where governments are key players. Some standardisation of curriculum at primary and secondary levels

will encourage people to develop eLearning content for it. Governments can then help the creation of Learning Object Repositories to make this content accessible. Governments will also want to provide guidance about Learning Management Systems (LMSs) for use in the public system. Brazil, for example, has developed an LMS for nationwide use.

Related to infrastructure is the key issue of copyright. Educational institutions may be unduly 'copyright-shy' through ignorance about copyright laws, their countries' copyright exemptions and ways of using copyrighted materials legally.

Barriers of Bandwidth

A second role for governments, alongside other partners, is to reduce barriers to eLearning by making bandwidth available and affordable. First, bandwidth is limited because of telecommunications legislation and telecom company monopolies. Second, institutions do not usually buy bandwidth jointly in bulk. Third, institutions use bandwidth inefficiently through lack of policy and poor management. Fourth, the lack of affordable Internet terminals off campus calls for accessible kiosks and study centres.

The issue of access to telecommunications handicaps developing countries. Their institutions can pay over 100 times more for Internet access than in the industrialised world. An individual in an OECD country may have a 500-kilobit home Internet connection, whereas in a developing country a 500-kilobit line is all that an institution can afford for sharing by hundreds of users. Telecom companies add to the problem when they buy bandwidth from overseas Internet service providers. They could, for example, buy a 5 megabit line connection and over-sell it to 20 or 30 clients - still promising each client a dedicated 500 kilobit connection.

Making good Internet bandwidth affordable to institutions is an absolute necessity for any country aspiring to quality post-secondary education. Governments should ensure that their telecoms suppliers provide it. Expensive connectivity handicaps institutions and countries.

Institutions can tackle some issues themselves. When they buy bandwidth in bulk the price drops. In South Africa, for example, a small non-profit entity buys bandwidth for nearly 50 institutions at once. To gain this kind of negotiating power institutional leaders and IT departments must cooperate. There may be a role for American institutions to facilitate the creation of bandwidth cooperatives in developing countries by using their own clout with suppliers.

There is never enough bandwidth and solving the problems that we just listed will take time. Meanwhile, institutional managers should have policies for using bandwidth sensibly by defining acceptable use. These cover the kinds of data that may be transferred to and from the institution and the types of websites that may be visited.

Such policies are an essential stepping stone to technical strategies that maximise the benefits of bandwidth day and night. To guarantee bandwidth during the day for research and study, management

must focus on those functions and avoid usage for which there are alternatives. Demand for bandwidth is usually very low at night so it can be used other tasks. If normal patterns of information use follow a pattern, information from particular websites can be "pre-cached" to local servers for use the next day. The more the information requirements can be predicted, the more the load on Internet lines during the day can be reduced, releasing bandwidth for those tasks such as Internet searches that cannot be cached.

I appreciate that this kind of talk sounds quaint to American ears, because for you bandwidth is not a problem and you can use it in a profligate fashion if you so choose. But I assure you that this is a real and present problem in developing countries, which the increasing use of satellites will only solve slowly.

Learners in developing countries do not usually have computers and Internet links at home. They go instead to Internet kiosks or cafés where access is very expensive in terms of local salaries. Students are unlikely to connect for long enough, at the low Internet speeds available, to gain much information. Governments could subsidise kiosk prices and institutions should provide Internet access on campus over extended hours from early morning until late at night.

Institutions also face important non-technical issues in developing eLearning. In 2003 UNESCO's International Institute for Educational Planning (IIEP) conducted a series of case studies on the creation of virtual universities on six continents (www.unesco.org/iiep/virtualuniversity). They highlighted four issues that become particularly sensitive as institutions develop policies on open educational resources.

Institutional Development and Organisation

First, looking at institutional development and organisation, face-to-face teaching institutions may find it difficult to develop general policy on eLearning because their existing policies and procedures were conceived for a different learning environment. However, although distance-teaching institutions may already have a general policy framework that is appropriate for eLearning, they may find developing policy on OERs a serious challenge.

By putting the lecture notes of its faculty on the web with the aid of external funding MIT did not create a threat to its core business - provided, of course, that MIT's academic reputation could survive worldwide scrutiny of the material. However, for a large, high-quality distance-teaching institution like the UK Open University to make its self-instructional materials freely available could create a clear threat to its core business. Could the UKOU make OERs available to developing countries without giving competitors in the industrialised world the opportunity to compete against it with its own materials? This is a tough question for institutional leaders. Only experience can really provide an answer. Whilst there is some evidence that making the texts of books freely available on the Web increases sales of the printed versions, we need more research on this issue for eLearning.

Management

Then there are some direct challenges of management. A brand new institution can develop its organisation and management around an eLearning business model. Existing institutions starting from an older business model may be wise to create a distinct entity for eLearning within existing structures. Either way institutions must be ready to invest although they may not see the returns for years. Training in eLearning is vital for both faculty and technical staff, especially in developing countries where it presents such an important opportunity.

Training and sound information are particularly important in the choice of learning management systems. The business of developing such systems, both proprietary and open source, is alive and well. One result is that these systems are increasingly interoperable, so changing platforms need not mean scrapping previous investments in eLearning materials. However, the choice of a learning management system remains an important decision. COL has developed a [decision support tool](#) to help decision makers make a selection. Determining which learning management system an institution should choose is not COL's role, but this tool can be used by a management team to work through the decision in a systematic way and serve as a guide for the training of support staff.

Academic Issues

There are various academic issues, beginning with the choice of the right programmes. A feasibility study may help to identify subjects that are in demand and for which eLearning is appropriate. Whatever the subjects chosen, developing, supporting and rewarding the staff involved is crucial if the eLearning curriculum is to be more than a congeries of the favourite courses of faculty enthusiasts.

eLearning is often touted as student centred. To make this true this requires careful planning of student services and student aid. Some services will need to be available continuously (24/7) and developing countries will need study centres.

National and International Environment

Finally, expanding eLearning has national and international implications. The high cost of developing eLearning argues for national and international partnerships and cooperation in its production and provision. This is what motivated the ministers of education of the small states of the Commonwealth to call for the creation of a virtual university as a framework in which they could work together to create courses and programmes, thus avoiding total dependence on larger states.

Creating the eLearning Revolution

We shall close by putting the challenge to you. How do we enhance collaboration between partners? What can we ourselves do to create and foster the eLearning revolution?

The stakes are high. In other sectors ICTs and the Internet have created new business models that have made products and services more accessible by reducing their cost and improving their convenience. How can we effect similar transformations in education? Can eLearning take post-secondary education to the billions at the bottom of the pyramid? What must we do to rise to challenge of the four 'A's and make eLearning accessible, appropriate, accredited and affordable?

Mechanisms for Collaboration

Collaboration needs enabling mechanisms. We identify five. First, it is invaluable to link the leading institutions and figures in eLearning through organisations like MERLOT and virtual forums, such as those organised by the International Institute for Educational Planning. These forums should become a regular series.

Second, some collaborative ventures require external funding. Here we pay a sincere tribute to the Hewlett Foundation, which has funded initiatives in eLearning and open educational resources in an effective and disinterested way, thereby helping to create an international eLearning community.

Third, collaboration in linking together learning object repositories is a natural extension of the vision of open educational resources. The aim, if I may re-order the title of my own institution, is to make learning the common wealth of the whole world.

Fourth, training in both policy and practice for eLearning is a continuing need and a critical factor in its expansion. There is already evidence that eLearning is liberating for trained faculty in developing countries because what they can create is limited only by their imagination and knowledge, not by their institution's ability to afford imported materials or software licences.

Fifth and finally, as we have already noted, international collaboration is a necessary foundation for quality assurance through such mechanisms as the UNESCO/OECD guidelines on cross-border education and the regional conventions on the recognition of qualifications.

Conclusion

It is time to conclude. We encourage you all to harness your energies to the goals that we have laid out. There is enormous pent-up intellectual creativity among the billions of poor people in the world. Sadly, existing models of post-secondary education have been too expensive and too inflexible to respond to their needs. Surely our aim must be to combine connectivity with open educational resources so as to create a global intellectual commons accessible to the whole of humankind?

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