

eLearning and Free Open Source Software: the Key to Global Mass Higher Education?



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Introduction

It is a pleasure to be with you on my first visit to Malaysia since joining the Commonwealth of Learning. But I have been to Malaysia many times in my previous jobs, notably when I was Vice-Chancellor of the UK Open University. As you know, I had the great privilege of taking over the job of President of COL from a very distinguished Malaysian, Professor Raj Dhanarajan, who left me an institution in excellent shape.

I also greet you on behalf of my co-authors, Susan D'Antoni of UNESCO's International Institute for Educational Planning, Stamenka Uvalić-Trumbić of the UNESCO Secretariat, and my colleague Paul West of the Commonwealth of Learning. As you can see, this paper is a product of collaboration between COL and UNESCO and each of the authors brings a different perspective to the subject of this address, which is eLearning and Free Open Source Software: The Key to Global Mass Higher Education? Our aim is to address a major challenge of the 21st century. Can we give billions of poor people access to post-secondary education? Can we connect technology to teaching and learning for their benefit? We shall

explore eLearning in a global context through a wide-angle international lens.

Growing Demand for Post-Secondary Education

The major global trend in post-secondary education is 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. That and a follow-up conference five years later revealed that post-secondary education faces the most radical shake-up in its history.

The challenge begins 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. Here in Malaysia the Government has just announced that it wants to see 1.6 million students in higher education by 2010 compared to 600,000 at present - a 260% increase.

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. Malaysia is a remarkable example of a country that has acted on that conviction.

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, sometimes by 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 Uvalić-Trumbić, 2005).

This means that developing countries must rely mainly on home-grown solutions to expand post-secondary education. 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. Post-secondary education can learn from the findings of C.K. Prahalad and his colleagues about serving those at the bottom of the world economic pyramid (Prahalad, 2004). They draw attention to the four billion poor people in the world who aspire to better lives. They urge commercial 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 post-secondary education amongst these four billion people? An APR of 35% within this group would yield 150 million additional post-secondary students, far more than total current enrolments worldwide. Post-secondary 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' (Prahalad & Hart, 2002).

Is eLearning the solution?

Can eLearning respond to the challenge, or is it just another over-hyped but underperforming attempt to connect technology to teaching and learning?

In their study of the experience of eLearning in American post-secondary education Zemsky and Massy (2004a, 2004b) 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. Here the most promising innovation 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 not lived up to the expectations. 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 possible the sharing and adaptation of courseware on a more equal basis. Re-usable learning objects are the equivalent of the published articles on which subsequent researchers can build. If providers of post-secondary education can successfully combine connectivity and shared courseware into a new business model of sharing on an equal basis 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 (D'Antoni, 2002).

Is it accessible?

First, 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 to provide ready Internet connectivity.

The second imperative is to make OERs more accessible and to expand their numbers. The Commonwealth of Learning 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.

Is it appropriate?

Once eLearning is accessible, is what it offers appropriate? 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.

Is it accredited?

The third question is accreditation. 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? By creating a unified approach to accreditation through the new Malaysian Qualifications Authority Malaysia will be able to tackle this question in a coherent way.

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).

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, we shall not see digital dividend replace digital divide. 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.

The signs are that expanding higher education through ICTs and on-line provision is a global trend (Uvalić-Trumbić & 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 (see: www.col.org/virtualu_invite.htm).

What are governments' interests?

What are the interests of governments in eLearning and their role in advancing it? What are the interests and roles of institutions?

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, developed and developing countries alike 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.

Satisfying the requirements

Governments and institutions clearly have an in encouraging eLearning. A moment ago I identified the four 'A's that are the requirements for eLearning to flourish. How do we satisfy them? Action is required from both governments and institutions.

What should governments do and not do to further their interest in eLearning? Failed projects like the UK's e-Universities venture suggest that governments and their agencies should not operate eLearning programmes except for governmental functions like offering instruction about the Highway Code.

Governments' role is to create the context in which eLearning can flourish. This is a crucial task in developing countries, where the context for eLearning is usually unfavourable. Malaysia is a shining exception to this rule, although more and more countries are realising that imposing high costs on connectivity is counter productive

What are the barriers to eLearning that governments and institutions could surmount? We see five. 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. Fifth, institutions may be unduly 'copyright-shy' through ignorance about copyright laws, their countries' copyright exemptions and ways of using copyrighted materials legally.

Access to Bandwidth

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. 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.

Maximising the benefits of bandwidth

Institutions can tackle some issues themselves. When they club together to 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 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 daily information use follows 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.

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

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 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.

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 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

Expanding eLearning also 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.

Management

Finally, there are plenty of challenges for management that straddle the distinction between technical and non-technical. We shall concentrate on just one hot issue: proprietary or open source? This is a strategic matter which is at the heart of management's core function of getting the best results with the available resources. The recent announcement by Australia's Northern Territory Government that it had been able to put 1,000 more terminals in schools by saving \$1 million through a move to open source software shows that significant sums are at stake. Institutions in developing countries do not have money to burn!

Managers must overcome their reluctance to challenge their technical specialists and engage with the issue in a systematic way. Prescribing choices between open source and proprietary software is not appropriate and each institutional situation must be reviewed on its merits.

We make seven points:

First, IT departments should have standard procedures in place for making decisions about acquiring hardware and software. Senior management's task is to ensure that these procedures avoid sub-optimal choices by taking the bigger institutional picture into account. For example, COL has developed a decision making aid for acquiring a Learning Management System. (www.col.org/Consultancies/04LMSEvaluation.htm).

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.

Second, decisions must be taken with a long-term perspective, looking beyond the present window of a particular offer for a special licence-fee.

Third, the IT people must be able to assess what functions can be performed with open source software and be aware that not all open source software is free open source software. However, the term open source does mean that the code is available to institutions, which can usually make contributions and improvements to it.

Fourth, institutions need to balance the merits of specialisation with cross-training so that IT staff can work competently in both Linux and Windows environments. There are quite a few competent trainers in Africa and COL can help match needs to people. Having cross-trained IT staff is the best way of ensuring that an institution gets the best out of both proprietary and open source solutions.

Fifth, remember that including Linux in an organisation does not mean having to change everyone's computer. The server room is likely to be the first place for FOSS applications to appear. Money saved by using a free product can be applied to applications where a free product is not an alternative.

Sixth, teaching institutions should aim for variety and specialisation in setting up computer labs. Teaching a particular application (e.g. Lotus) requires the systems for that task, but teaching generic concepts and skills, such as word processing, spreadsheets and presentations can use free systems like Linux and Open Office, saving thousands of dollars in licence fees.

Seventh it is particularly important to encourage students in developing countries to write code for open source software so that they can join the worldwide community of code writers. COL would be very pleased to hear from universities who are willing to have students contribute to the program code of our Learning Object Repository, COL-LOR (eRIB) by creating features which everyone can benefit from. This open source LOR, which can link a network of LOR's together, was made possible by Canada's Canarie programme of support to eLearning.

Mechanisms for Collaboration

Underlying much of what we have said is the need for collaboration. The reality of greater connectivity makes greater collaboration possible and the ideal of open educational resources requires it. How can we enhance collaboration? Collaboration needs enabling mechanisms. We identify five.

First, it is invaluable to link the leading institutions and figures in eLearning through virtual forums, such as those organised by the International Institute for Educational Planning. These forums should become a regular series. Face to face meetings among practitioners are also useful. I invite you cordially to attend the Fourth Pan-Commonwealth Forum on Open Learning that will be held in Jamaica at the end of October. eLearning and Open Educational Resources will be a major theme of the meeting.

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 challenges of transforming the digital divide into a digital dividend for the developing world. eLearning, drawing heavily on Free Open Source Software and Open Educational Resources, give us the chance to do that. There is enormous pent-up intellectual creativity among the billions of poor people in the world. Sadly, most existing means of learning and training have been too expensive and too inflexible to respond to their needs. Surely our aim must be to combine connectivity with learning resources so as to create a global intellectual commons accessible to the whole of humankind?

Malaysia could play an important role in this process. This country had recently committed to a major expansion of higher education and you have invested for years, through the super-corridor and other initiatives, in taking advantage of online technologies and eLearning. Finally, the Government is determined to increase the international role of Malaysian higher education. Here is an important project for you. I wish you success and I thank you for inviting me to address you this morning.

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