

Is eLearning True to the Principles of Technology?



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Abstract

What is technology and what are its strengths? We shall define technology in a people-centred way and recall Adam's Smith's analysis of technology in terms of division of labour, specialisation, economies of scale and machines. In other areas of life technology has used these principles to increase access, improve quality and lower costs. Is this true of eLearning? If not, how can we make it true? Will Open Educational Resources save the day? We shall address these questions in the light of the experience of the Commonwealth of Learning in 45 developing countries, three-quarters of them being small states.

Introduction

It is a pleasure to be here with you. Welcome to Vancouver!

I returned here on Saturday from a two-week trip that had taken me to five Asian countries: Sri Lanka, India, China, Bangladesh and Malaysia. After that marathon I feel very warmly towards people like you who invite me to speak in my home city within walking distance of my office, which is just behind the sails in this picture.

Let me also make the rather obvious remark that visiting those five countries was a salutary reminder, if I needed one, that possibilities for individuals and institutions to engage in eLearning vary widely even within one region of the world.

Where you stand on an issue depends on where you sit, so I shall begin by telling you briefly where I am coming from by describing the mission of the Commonwealth of Learning which I head. That will lead me to emphasise the absolute importance of technology to the educational development of the world. So far so good!

After that, however, I may part company with some of you because I shall give you my views on what the overall purpose of using technology in education, training and learning should be. These may not be the

purposes that you espouse.

I have sometimes given speeches entitled Technology is the Answer: What was the Question? Form should follow function so I shall spend some time explaining what my question is and how technology can answer it. At that point I shall recall the fundamental principles of technology and show how they are indeed an answer to my question.

My worry is that with the effervescent development of technology over the last many years we are in danger of losing sight of those key principles of technology and are therefore missing out on the potential of technology to provide answers to some of the big questions facing humankind.

That is why I have entitled these remarks: *Is eLearning true to the principles of technology?*

In the last part of the address I shall explore what I consider to be the most promising aspects of eLearning in terms of the goals that I espouse. These are Open Educational Resources, Wikis and the collaborative development of courseware, which is all exemplified in a very interesting development that we have facilitated, the Virtual University for Small States of the Commonwealth.

The Commonwealth of Learning

Let me begin then by telling you all you need to know about the Commonwealth of Learning in order to understand where I am coming from.

To help those of you from the antipodes – or merely from south of the border – who may associate the word Commonwealth with Australia, Massachusetts or Virginia, you should know that I use it to designate the free association of 52 countries that are united by the values of equality, democracy, good government, peace and the cultivation of respect and understanding among their peoples. It is also relevant to a later point that two-thirds of Commonwealth members are small states with populations of 1.5 million or less. They have to be a special focus for any Commonwealth body like the Commonwealth of Learning.

We are an intergovernmental body created by Commonwealth Heads of Government when they held their biennial summit in here in Vancouver in 1987. They were motivated by the idea that information and communications technologies (ICTs) should not just be the preserve of business and entertainment but should be applied to education, training and learning.

So our mission is to help Commonwealth governments and institutions use a variety of technologies to expand and improve learning for development. By ‘development’ we mean a blend of the Millennium Development Goals, the Dakar Goals of Education for All, and the Commonwealth values that I alluded to earlier.

The Heads of Government believed in 1987 that educational technology – particularly the application that we call distance learning – had the potential to achieve economies of scale, geographical reach, flexibility

and cost-effectiveness. Perhaps the most striking evidence that they were right lies in the growth of open universities across the Commonwealth in the 20 years since COL was set up.

Our headquarters is here in Vancouver and we also have a small unit in New Delhi, the Commonwealth Educational Media Centre for Asia, which is doing some remarkable things in putting available technologies together in new ways to achieve some very inexpensive and powerful applications. We are a small organisation with a total of only 40 staff in Vancouver and New Delhi combined, but we punch above our weight thanks to our focal points in all 52 countries and our networks of partners all over the Commonwealth.

What do we actually do? We work in two areas. One sector is aimed at expanding and improving the formal education sector.

The first of its four activities is open schooling, which is the use of distance learning and technology to attack what is currently the world's biggest educational challenge, namely to scale up secondary schooling. Second is teacher education, another huge challenge at a time when the world – not just the developing world – needs 10 million more teachers. Third is higher education, where we focus particularly on quality assurance, especially as it applies to distance learning and the use of ICTs. Finally, there is the Virtual University for Small States of the Commonwealth, already mentioned.

Our other sector addresses the challenges of more informal learning. Another huge global challenge is skills development for tens of millions of young people so that they can earn livelihoods. A particular facet of this is learning for farming because, despite massive migration to the cities, improving the prosperity of rural farmers is crucial to both food security and global development. Closely allied is health of people, where we encourage people to use their community media to take charge of some of their own health education. Finally, in both the formal and informal sectors we face a high demand for training in eLearning.

So that is what COL does. But why do we use technology in education and learning, and what is our interest in eLearning? I said earlier that form should follow function; we should define ends before means. So what is the public, through its governments, trying to achieve in education?

The Challenges Facing Education

Ministers of Education will tell you that the challenge they face is to pursue three goals simultaneously. They want to widen access so that education and training can be available to all citizens that aspire to it. Worldwide, despite valiant efforts, many citizens are not achieving their aspirations for education at all levels. Second, that education must be of good quality. There is no point in widening access unless education makes a difference to people's thinking and their lives. Third, the cost must be as low as possible. Governments and individuals never have enough money. It is wrong to make education more expensive than necessary, because low cost will enable more people to take advantage of it.

So governments and the public want three outcomes from their higher education systems:

- Access: to be as wide as possible
- Quality: to be as high as possible
- Cost: to be as low as possible

The nature of the challenge is clear when you create a triangle of vectors. With traditional methods of face-to-face teaching this is an iron triangle. You want to stretch the triangle like this to give greater access, higher quality and lower costs. But you can't! Try extending access by packing more students into each classroom and you will be accused of damaging quality. Try improving quality with better learning resources and the cost will go up. Try cutting costs and you will endanger both access and quality.

This iron triangle has hindered the expansion of education throughout history. It has created in the public mind – and probably in your own thinking – an insidious link between quality and exclusivity. This link still drives the admission policies of many universities, which define their quality by the people they exclude.

The Contribution of Technology

But today there is good news. Thanks to globalisation successive waves of technology are sweeping the world – and technology can transform the iron triangle into a flexible triangle. By using technology you can achieve wider access, higher quality and lower cost *all at the same time*. This is a revolution – it has never happened before. This is what educational technology can achieve if used properly.

What is technology? We define it as the application of scientific and other organized knowledge to practical tasks by organizations consisting of people and machines, so it draws on non-scientific knowledge as well as applied science. Technology is about practical tasks rather than theory and always involves people and their social systems. Expanding and improving education is a very practical task. People and their social systems are at the heart of it.

But how does technology work? The fundamental principles of technology, articulated two centuries ago by the economist Adam Smith, are division of labour, specialisation, economies of scale, and the use of machines and communications media.

An Example: the UK Open University

Before explaining how this works and exploring my worries about the development of eLearning I shall give an example of the success of this technological revolution. I choose one that I know well: the UK Open University. I headed that university during the 1990s but that was ten years ago and I shall cite recent figures for access, quality and cost.

With 220,000 students in award-bearing programmes the UKOU has clearly expanded access. Furthermore, this is not just in the UK since 60,000 of its students are overseas. Then there are a million students around the world taking UKOU courses embedded within local awards. Many of these courses derive from the Open Educational Resources on the UKOU's OpenLearn website.

More surprising to you – and more embarrassing for the UK’s self-designated ‘elite’ universities, is the UKOU’s performance in national comparative assessments of teaching quality. This table dates from 2004, but there will never be another one because in that year the elite universities went to the Prime Minister and begged him to discontinue this type of assessment. However, as I note at the bottom of the slide, the government now conducts national surveys of student satisfaction with a very large sample of students and the Open University has come top three years running.

Finally, the last time costs were compared, the cost per graduate of the UKOU was 60-80% that of conventional universities depending on the subject. So the Open University has achieved the technological revolution of wider access, higher quality and lower cost. It has stretched the iron triangle.

How has this been achieved? It has been done through the combination of Adam Smith’s technological principles. In the category ‘Machines and ICTs’ the UKOU offers a multi-media system of distance learning with strong student support. This multi-media system includes some of the world’s largest deployments of eLearning but the key issue is not the use of eLearning or any of the other media, but the focus on division of labour, specialisation and economies of scale. You could say that the UKOU divides the teaching and learning process into its constituent parts, gets different people to specialise in doing each part as well as possible and then puts it all back together again into an integrated system.

Mega-Institutions

I hasten to say that the UKOU is not alone in achieving this revolution. In the 1990s I published a book entitled *Mega-Universities and Knowledge Media: Technology Strategies for Higher Education* that identified eleven distance-teaching universities with over 100,000 students. Since then these institutions have both grown and multiplied as you saw in a previous slide. Now we are seeing the same principles being applied to secondary schooling, as I describe in a forthcoming book called *Mega-Schools, Technology and Teachers: Achieving Education for All*.

In this case I set the threshold at 10,000 pupils because schools tend to be smaller than universities, even though some open schools, such as India’s National Institute for Open Schooling, with 1.6 million pupils, are very big.

Division of Labour and Specialisation

My key point is that to operate at scale with low cost and consistent quality all such operations, independent of the learning media they use, implement the principles of division of labour and specialisation. In all you can identify these three organisational sub-systems of administration & logistics, course development and student support – and there are, of course, finer divisions of labour and specialisation within each sub-system.

The teaching learning system of the UK Open University makes ample use of eLearning with most of its 200,000 + students online, whereas much of the learning in India’s National Institute for Open Schooling

is print-based. However, you will recognise the same sub-systems in each case.

Now we get to the nub of my argument, the title of this talk and the source of my anxieties. There is, of course, no reason why you can't operate with division of labour and specialisation through such sub-systems when you offer pure eLearning. Indeed, there is every reason why you should, for the reasons that I have adduced.

But my impression is that, at least in higher education, you don't. Indeed, I've heard it argued that one of the attractions of eLearning is that it doesn't require faculty to operate in a different way. They can continue with the cottage industry approach, with each academic doing their own thing and taking care of every step in the instructional process. My fellow Vancouverite Tony Bates calls this the 'Lone-Ranger' approach to eLearning.

Earlier I cited Adam Smith's list of the principles of technology. Some of you will have recognised it from his description of the pin factory, one of the classics of economics that you can find in seconds on the web. I recommend you read it.

His basic point was that when you make pins in a factory they are a lot cheaper, and of more consistent quality, than if one artisan makes them individually. I can safely assert that no one would dream of making pins individually today, but this inefficient, poor-quality approach persists in higher education. Worse, eLearning is often being used to embed it and make higher education less cost-effective than it was before, because it is simply an add-on to existing practice.

This may not matter in rich jurisdictions like North America where the monumental function of universities has always trumped considerations of cost-effectiveness – and where, until now at least – institutions have been able to hike tuition fees faster than the rate of inflation rather than trying to give the student better value for money.

An Assignment: Examples of Cost-Effective eLearning

I would love to be proved wrong. As your assignment for this session I beg you to send me any studies you have that shows eLearning to have increased the overall cost-effectiveness of a higher education institution. Please send them to jdaniel@col.org and I will give you a free copy of COL's Three Year Plan for 2009-2012. Note that I'm not talking about the rather pointless studies that show 'no significant difference' in learning outcomes when eLearning is compared to classroom teaching. I want to know if the overall efficiency of the university or college has been improved, classrooms have been decommissioned and there has been genuine substitution of capital (i.e. technology) for labour. This may not matter in rich jurisdictions, but it matters a lot in the places in which I work where resources are scarce and access to education woefully limited. In such places the insidious links between quality, cost and exclusivity are balls and chains holding nations back.

Promising Developments in eLearning

In the final part of these remarks I shall highlight three facets or applications of eLearning that seem to me very promising in the context of scaling up learning, improving its quality and cutting its costs.

Open Educational Resources

The first is Open Educational Resources. I'm sure I don't need to explain what these are to technological sophisticates like you but here is the definition from OER Africa:

'educational resources that are freely available for use by educators and learners, without an accompanying need to pay royalties or license fees. A broad spectrum of frameworks is emerging to govern how OER are licensed for use, some of which simply allow copying and others that make provision for users to adapt the resources that they use. OER is not synonymous with online learning or eLearning, and indeed, in an African context, it is anticipated that many of the resources produced –while shareable in a digital format (both online and via offline formats such as CD-ROM) – will be printable. Thus, we anticipate that a very high percentage of resources of relevance to African higher education will be shared as RTF or similar files (for purposes of adaptation) and packaged as PDF files (for purposes of printing)'

I find this notion of a global intellectual commons very exciting, provided that it is not perverted into an exercise in neo-colonialism. Could I have a show of hands from those who have produced an OER? Could I now have a show of hands from those who have used or adapted an OER produced by someone else? Finally, please show if you have used and adapted an OER from another country.

Thank you. I find that very reassuring. My hypothesis, which was that producers of their own OERs would greatly outnumber the users of other people's OERs, has been disproven. Furthermore a very respectable number of you have used OERs from other countries. That is a most encouraging trend and suggests that OERs really are becoming a global intellectual commons.

At the Commonwealth of Learning we are increasingly involved in OERs because they can contribute to our three objectives of scaling up quality learning at low cost. In her work in Open Schooling my colleague Frances Ferreira has a project, supported by the Hewlett Foundation, through which six countries are joining together to producing and share OERs for a complete senior secondary curriculum.

Likewise Abdurrahman Umar is deeply involved in TESSA (Teacher Education in Sub-Saharan Africa), a consortium of 18 African universities and the UKOU that has produced a huge range of OERs for classroom-focused in-service teacher education at primary level. They are being used by half a million African teachers this year.

Wikis

A second application of eLearning that we have found useful – and which has made us think hard about the nature of open content – is wikis. A few years ago our COL colleague Wayne Mackintosh created

WikiEducator. It very quickly attracted tens of thousands of participants. With support from the Hewlett Foundation, he used it in a very original way to train thousands of people through face-to-face and online workshops. The deal is that teachers can learn wiki skills free provided they use those skills to contribute one lesson to the pool of OERs.

Wayne is now running a Centre for Open Education in New Zealand and WikiEducator is being organised from there. His successor at COL is Trudi van Wyk, who was responsible for the policy for computing in South African schools until she joined us last month. She will continue to respond to the many requests we receive for help with policy and training in eLearning, using the Learning for Content and other approaches.

Collaborative content development

Let me conclude these remarks by talking about a project that brings several aspects of our work in eLearning together: the Virtual University for Small States of the Commonwealth.

Calling a new institution a virtual university has usually been a kiss of death, so let me stress immediately that the VUSSC, as we call it, is not a new institution but a collaborative network whereby the 32 small states whose flags you see here work together to create postsecondary, skills-related course material in the form of OERs. The VUSSC has been well documented elsewhere so I won't go into detail here but will make a few quick points.

First, for the small states involved the training of people is just as important as content development. The project was conceived by the Ministers of Education from the Commonwealth's small states when they met in 2000 in the middle of the dotcom frenzy. They judged that their small countries, which are dotted around the globe, did not have the critical mass of infrastructure or IT skills for any of them to go it alone in the eWorld. However, they thought that by working together as a group of small states they could become players in online learning rather than depending on their bigger neighbours.

Second, for these reasons we start the development of each subject area with a face-to-face workshop, like this one held in Mauritius, where participants from the interested countries learn a range of IT skills and begin content development that will continue online when they get home. They also have the obligation, after they return home, to train five other colleagues in the skills they have learned. In this way some 500 people in 32 small states have now acquired skills in the collaborative development of courseware online. This has had a transformative impact on these small countries, where the Ministry of Education may only have a handful of professional staff and the tertiary institutions have a small faculty.

Third, as I said, the purpose of the VUSSC is to strengthen local institutions through staff training and by making available OERs for use both in the classroom and at a distance. The VUSSC is not a new institution competing with local providers. In order to facilitate the use in all countries of eLearning courses that are developed the VUSSC has developed a Transnational Qualifications Framework. This does not replace national qualifications frameworks but is more of a conversion table to help someone in, say, Samoa see where a course originating in, say, Trinidad and Tobago, fits into their own framework.

Establishing the credibility of courses within the VUSSC is especially important because the small states sadly are a favourite prey of degree mills and some jurisdictions are suspicious of any qualifications emanating from them. In order to go on the VUSSC portal each course has to be offered by an accredited institution in its own state and fit into to the regional qualifications framework if one exists.

Let me end this part by saying that we are rather proud of having produced the Transnational Qualifications Framework because groups of bigger states have tried to do it without success so far. As a result the VUSSC TQF is becoming a reference beyond the small states.

Conclusion

It's time for me to conclude. What have I been saying?

First, that world's challenges of education, training and learning are too serious for us to play around at the edges. We need educational methods that can broaden access, improve quality and cut costs, all at the same time.

Second, technology can do this if it remains true to its fundamental principles of division of labour, specialisation, economies of scale and the use of machines. The industrial revolution was created by following these principles, with the result that we can now take for granted that almost every product we want will be widely available, of consistent quality, and costing steadily less. This is also true of many services.

But it is not true of education, although things are changing. The steady evolution of teaching and learning media, incorporated into open and distance learning are finally beginning to stretch the iron triangle in the way that is needed.

However, I worry that eLearning, which should be a wonderful addition to the growing toolkit of educational technology, is provoking a throwback to pre-industrial times and allowing the cottage-industry approach to teaching and learning to reassert itself.

Please prove me wrong.

Thank you