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***Collaboration and Networking: The role of Open Educational Resources (OER)***

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Summary

In principle information and communications technologies (ICT) have the potential to revolutionize education for three reasons: they facilitate the manipulation of symbols, which is a fundamental function of education; they allow the cost-free distribution of quality materials; and they allow economies of scale with consistent quality. Nevertheless, most applications of ICT in education fall far short of this potential. Introducing computers into basic education has been a disappointment and the development of online learning in universities seems likely to cause disruption before it yields benefits.

The paper argues that Open Educational Resources (OER) are an important key for unlocking the potential of ICT in education. OER, which are the result of worldwide collaboration, allow teachers and institutions worldwide to create and use high quality learning materials that are fully adapted to suit local contexts. A description of the development of the concept of OER over the last decade leads into an analysis of the implications of the 2012 Paris Declaration on OER.

Introduction: The Potential of ICT

ICT has the potential both to improve the quality of education at all levels and to make it far more widely accessible.

ICT has this potential because educators and academics realise that the combination of digitally based information and communication technologies gives much more powerful possibilities improving education than all previous educational technologies from the blackboard to television. A first reason is that much of teaching and learning is about the manipulation of symbols (words, numbers, formulae or images). ICTs are qualitatively different from previous educational 'aids' in their power to manipulate symbols.

ICT can also make education more widely accessible because the Internet is an extraordinary means for the wide and low-cost distribution of information, knowledge and educational material generally. More recently, as the Internet has also become a vehicle for interaction, its potential for teaching and learning has become even more significant. With the advent of Open Educational Resources (OER) the long sought objective of creating wide access to learning material of quality is within reach.

***The Nature of Technology***

In applying ICT to learning, training and teaching we should start by recalling the features that they share with all technologies. Many applications of ICT in education fail – or at least underperform – because these fundamental characteristics of technology are neglected because of too close a focus on particular machines.

All technology shares two common sets of features. One set is captured in the definition of technology as 'the creative application of both scientific and tacit knowledge to organised tasks involving people and machines aimed at meeting sustainable goals' (Lane, 2012). This definition includes three key factors. First, technology is about taking action to meet a human need – in this case education. Second, technology does not rely only on scientific knowledge but also includes values and practical craft know-how. In the iPod, for example, the physics needed to make a small device carry a large repertoire of music is married to the creative design of an attractive accessory. Third, technology involves organized ways of doing things. It covers the intended and unintended interactions between machines and the people and systems that are affected by them through various processes.

This last point is particularly important. Many attempts to introduce ICT in education have disappointed because their promoters did not pay sufficient attention to the people and systems involved.

The second set of common features of technology explains why technology has transformed everyday life since the industrial revolution by making most of the products and services that we use cheaper, better and more available. Adam Smith captured the essence of this revolution two hundred years ago in his classic book, *The Wealth of Nations*, where he argued that the application of technology involves division of labour, specialisation and economies of scale – as well as the use of machines.

These are also important principles for the application of ICT in education, where the goal must be to raise the quality, efficiency and accessibility of teaching and learning just as technology has done for other products and services.

### *The Technological Revolution in Education*

All governments share three objectives for their education systems. They seek to widen access to education and training at all levels, they want to raise the quality of the outcomes of learning and they must keep costs low so as to maximise the efficiency and effectiveness of their investment of public funds (Daniel, 1996).

Representing these goals of access, quality and cost as a triangle of vectors illustrates well the potentially revolutionary contribution of ICT (Daniel, 2010). The overall aim is to stretch the triangle by lengthening the vectors of access and quality while shortening the vector of cost. In conventional classroom education where a single teacher instructs a group of learners it is impossible to stretch the triangle in this way. Attempting to increase access by packing more learners into the classroom will provoke accusations that quality is being lost. Trying to increase quality with more learning resources and better teachers will increase the cost. If costs are cut directly both access and quality will likely suffer.

Technology has already stretched this 'iron' triangle for most of the other products and services that we rely on in everyday life. To give just two examples: modern cars are incomparably better and more affordable than the private transport of earlier times, while contemporary dentistry has vastly improved people's oral health. The intelligent use of ICT can bring similar revolutions to learning, training and teaching.

Open Educational Resources: Coming of Age

Open Educational Resources (OER) have the potential finally to unlock the tremendous potential of ICT for education. The growing availability of OER will dramatically could signal the end of the period when so many attempts to introduce computers into schools and online learning into universities have given disappointing results. Teachers may change their attitude to ICT dramatically as good quality and relevant OER become plentiful, easy to locate and simple to adapt and modify. Their effectiveness in using ICT for could be transformed.

Open Educational Resources are part of a wider trend towards greater openness and sharing that has been gathering momentum for over twenty years. It is helpful to divide its manifestations in education into three inter-related elements.

*Open source software* already has a relatively long history and has transformed computing by making reliable software widely available and readily adaptable for new applications.

The term *'open access'* is usually used to refer to open access to research results, especially where the research has been supported by public funds. The open access movement is thriving. Universities and their academic staff are rebelling against the high prices demanded for commercially published scientific journals for which scholars and researchers provide their papers without charge. They are supported by increasing number of research granting programs of governments and foundations, which insist that the research data, results and papers that are produced with their grants be made freely available to the public.

*Open Educational Resources*, which are the third element in this triad of openness, are defined as educational materials that may be freely accessed, reused, modified and shared. This includes materials in all formats. While nearly all OER are generated through digital technology, they are often used in print format. This is the case, for example, in what is probably the largest international OER project, *Teacher Education in Sub-Saharan Africa,* or *TESSA*, where OER are used by hundreds of thousands of teachers annually in at least 12 African countries.

The OER movement came to public notice in 2001 when the Massachusetts Institute of Technology (MIT) announced its OpenCourseWare program and began making some of the teaching notes and materials of its instructors for 100 of its courses freely available on the web. It sounded too good to be true, coming from such an eminent institution. However, MIT promised, with the support of the William and Flora Hewlett Foundation, to make materials from all its courses freely available in this manner by 2007 and has delivered on that promise.

As a consequence of the enthusiasm generated by MIT's OpenCourseWare project UNESCO organized a Forum on the Impact of Open Courseware for Higher Education in Developing Countries in Paris in July 2002. The Forum brought together MIT, the Hewlett Foundation and higher education institutions from the developed and developing worlds to explore this new approach to making teaching materials available and to suggest how it might help developing countries to access knowledge and educational resources of quality.

That Forum was a major milestone for the OER movement. The term Open Educational Resources was coined at that meeting to mean educational materials that may be freely accessed, reused, modified and shared. The participants adopted a Declaration, which expressed "their wish to develop together a universal educational resource for the whole of humanity, to be referred to henceforth as Open Educational Resources".

The 2002 Forum on Open Courseware and OER stimulated a series of developments and created a global movement for the open licensing of educational and creative works. Whereas MIT had launched the movement by putting lecturers' notes on the Web, the second generation of OER, of which the UK Open University's OpenLearn website is a good example, made available thousands of hours' worth of self-instruction of self open learning material from its courses.

These first two generations of OER activity were essentially the initiatives of individual institutions. A third generation of OER, based on worldwide collaboration, is the Virtual University for Small States of the Commonwealth, in which 32 small countries work together to produce OER that they can adapt for use in their higher education institutions for both classroom and distance teaching.

The development of this kind of multi-national and multi-directional collaboration in the creation and use of OER began to allay some of the fears that were expressed earlier about OER being a form of intellectual neo-colonialism. For example, at UNESCO's 2009 World Conference on Higher Education there was a robust exchange about OER between two South Africans. Professor Brenda Gourley, then Vice-Chancellor of the UK Open University, explained how the UKOU was making much of its course material available as OER on its OpenLearn website. However, Professor Barney Pityana, then Principal of UNISA, the University of South Africa, asked if OER were not potentially a form of neo-colonialism, with the north pushing its intellectual products at the south.

This was an occasion when flagging a potential problem helped the world to avoid it. Three years later, UNISA itself has developed a proactive institutional strategy for developing and using OER. It is also one of the anchor partners from six countries working together to develop the concept of an Open Educational Resource University. This statement says it all:

*'Our vision to be "the African university in service of humanity", our locatedness on the African continent and our significant global footprint place us in the unique position to represent African perspectives within the OER network while displaying local relevance and global consciousness.'*


UNISA is not alone. The African Virtual University (AVU) has developed an Open Education Resources Portal launched in 2011, which makes available 219 open educational modules in three languages (largely in mathematics and sciences); developed collaboratively in 10 African countries. 142 countries have downloaded these resources, Brazil and the USA being particularly significant users.

The 2009 UNESCO World Conference on Higher Education brought together some 2,000 participants representing higher education worldwide. In its Communiqué the Conference urged governments to give more attention to the roles of ICT and OER with

the result that later that year a resolution was presented at UNESCO's General Conference. It requested UNESCO to promote OER further, arguing that the time was now ripe to bring OER to the attention of governments. The resolution provided the incentive for UNESCO and the Commonwealth of Learning to work together in awareness raising and advocacy about OER.

Their joint initiative began in 2010-2011, with a project called *Taking OER Beyond the OER Community: Policy and Capacity for Developing Countries.* It held nine workshops for senior educational decision makers in Africa and Asia and produced two documents: A *Basic Guide to OER,* and *Guidelines for OER in Higher Education.* You can download them at http://www.col.org/oercongress.

Fostering Governmental Support for OER Internationally

That earlier project led on naturally to an awareness-raising project with governments in 2001-2012 called *Fostering Governmental Support for OER Internationally,* which like many OER projects, received support from the Hewlett Foundation. This activity had five elements:

- A survey of the world's governments about their use of OER,
- Holding Regional Policy Forums in six world regions,
- Exploring the Business Case for OER,
- Developing a Declaration to be presented at the World OER Congress, and
- The World OER Congress

I shall comment on them in turn.

*Survey of Governments*

With awareness of the importance of OER steadily increasing, a first step was to discover more about the expectations of governments for OER and whether governments were developing policies for their use. The project conducted a questionnaire survey of all governments and received responses from 100 countries.

Consultant Sarah Hoosen, who is based in South Africa, analyzed the replies from 82 countries that arrived before mid-April and her report is also available for downloading at http://www.col.org/oercongress.

To quote from Sarah Hoosen's report:

*There appears to be great interest in OER across all regions of the world, with several countries embarking on notable OER initiatives. Indeed, the survey itself raised interest and awareness of OER in countries that may not have had much prior exposure to the concept.*

Why should governments and institutions have this great interest in OER?

When the OER movement began it was motivated primarily by the ideal that knowledge is the common wealth of humankind and should be freely shared. Most institutions that decided to implement the ideal by creating OER relied on donor funding, notably from the Hewlett Foundation. But as the OER movement developed, questions about its sustainability became increasingly pressing. It could not rely indefinitely on donor

funding. Institutions and governments began to review the economics of OER in order to determine whether there was also a business case for investing in them.

The report of the survey of governments raises another important issue (Hoosen, 2012):

*...there appears to be some confusion regarding understanding of the concept and potential of OER. Many projects are geared to allowing online access to digitized educational content, but the materials themselves do not appear to be explicitly stated as OER. Where licences are open, the Creative Commons framework appears to be the most widely used licensing framework, but licensing options varies between countries.*

It was not the purpose of the COL/UNESCO project to propose particular approaches to open licensing but governments and institutions have to take open licensing seriously. It is not enough simply to place materials on a website and announce that anyone can use them.

Producers should understand that open licensing is not an assault on intellectual property rights but takes place within the framework of copyright legislation. Users worldwide need the assurance they can use the material without challenge and be made aware of any restrictions that apply to it.

In the project's regional policy forums, particularly the meeting in Rio de Janeiro for this Latin American region, there was no consensus on the restrictions that should be applied to open licensing. A majority of countries are relaxed about the commercial and for-profit use of OER although a minority opposes such use. That is why you will find the qualifying phrase 'with such restrictions as they judge necessary' in the recommendation on open licensing in the Paris Declaration.

*Regional Policy Forums*

The second element of the project was a series of six regional policy forums.

Although the questionnaire survey was useful, the project aimed to spark dialogue between government policy makers and OER practitioners around the world. They yielded information about the state of play with regard to OER in different parts of the world and allowed the Paris Declaration to be refined in an iterative way.

The project held regional forums in Barbados for the Anglophone Caribbean, Pretoria for Africa, Rio de Janeiro for Latin America, Cambridge, U.K. for Europe and North America, Bangkok for Asia-Pacific and finally Muscat for the Arab States.

You can find reports of all six regional forums at the website already mentioned but let me on them briefly.

The first was held in January for the Anglophone Caribbean in conjunction with an ICT in Education Leadership Forum (Commonwealth of Learning, 2012a, b, c; UNESCO, 2012a) and 10 Caribbean jurisdictions reported on the status of OER. Most Caribbean countries are introducing computers into their schools and the shortage of good learning materials for this purpose made them very receptive to the notion of Open Educational Resources. Indeed, the Cyril Potter Teachers Training College in Guyana had developed materials on ICTs for teachers by using existing OER from around the world, which the faculty members involved had found to be a rewarding experience.

The forum for Africa took place in Pretoria at the University of South Africa. 17 African countries reported on the status of OER in their countries. None, with the exception of South Africa, have a distinct governmental policy on OER, but the majority is active in the OER movement, mainly through institutions and individuals. Most African respondents associate OER closely associated with the introduction of ICT in education or with the development of open and distance learning, or both.

The forum revealed that the flow of OER is becoming truly multi-directional and global. OER created in Ghana are used in the USA and medical OER from Malawi are the basis of teaching in a number of other countries.

The forum for Latin America was in Rio de Janeiro and 10 countries reported on the status of OERs. The majority said that they have some governmental strategy or policy related to OER or intend to develop one.

Many of the countries have educational portals and also a range of policy documents that cover ICTs and Open and Distance Learning, some of which include OER.

The Forum for the Europe region was held at the University of Cambridge. 18 countries in the Europe region responded to our survey. Of these Austria, Finland, Hungary, the Netherlands, Poland and Slovenia are the most active in taking advantage of OER.

The Asia-Pacific region, which is very large and diverse, met in Bangkok. Five of the 19 countries that had responded said that they have government policies on OER in place. Most refer explicitly to the open licensing of educational materials.

In China, for example, the Ministry of Education has an OER policy and several OER action plans. Examples involving Chinese universities are the Video Open Courseware project and Open Digital Learning Resources for Continuing Education.

Finally, Oman hosted the Regional Policy Forum for the Arab states in Muscat in May. Although none of the 11 Arab responses referred to explicit governmental policies on OER, five have strategies related to eEducation or eLearning.

It became clear through these six regional forums that it is important for governments to take an active role in promoting OER. The conclusions from the Arab States forum are typical. First, education systems and institutions in most countries rely on government leadership. Second, governments can be prime beneficiaries of OER since by using OER they will gain much greater benefits from their large investment in educational materials.

*Exploring the Business Case for OER*

The third element of the project was exploring the business case for OER. This was added as the project progressed because of the increasing interest in the economics of OER. Neil Butcher and Sarah Hoosen did a research paper for the project on *Exploring the Business Case for Open Educational Resources.* It is still a work in progress but you can download the draft that was presented at the World OER Congress at http://www.col.org/oercongress.

Butcher and Hoosen situate the contribution of OER in the wider context of the challenges facing education at all levels in this era of economic stringency. They begin by arguing that greater reliance on resource-based learning, rather than large-group teaching, will be essential for securing wider access to quality education.

The authors give compelling evidence that using OER can reduce the cost of creating learning resources substantially. They also present some revealing analyses of the economics of textbook production, which again show that systematic processes of investing in OER can create very significant savings for governments and students. The commercial publishing industry could play a part in this process.

*The Paris Declaration*

A major aim of the COL/UNESCO project was to secure support for a Declaration urging governments to support OER and the use of open licences for educational materials. It was important to develop the draft of this Declaration in a very consultative manner and so it went through eight iterations as it was refined at each of the regional forums that I described.

For example, Africa strengthened the references to the importance of connectivity and electricity supply, the sharing of OER across languages, increasing research on OER and developing a business model for OER that embraces many stakeholders, including industry.

The Latin American meeting was particularly helpful in refining the Paris Declaration. It added references to internationally agreed statements in the Preamble, clarified terms, referred to strategic alliances and introduced the qualification "with such restrictions as judged necessary" to the reference to open licensing. Countries in this region have different views on what restrictions should be applied.

Europe added an action item about encouraging private and non-governmental organizations to contribute to OER.

The discussion in Bangkok strengthened the references to capacity building and incentives for teachers and institutions as well as respect for indigenous knowledge.

In Oman a new item on the need for governments to develop OER policies and strategies was added.

I am proud to say that because of the very iterative and consultative process through which it was developed the project's International Advisory and Liaison Committee, which acted as the drafting committee at the World OER Congress, made very few changes to the version that had come from the regions. The Congress then adopted the Paris Declaration by acclamation with no further changes.

I shall return to the implications of the Declaration after commenting briefly on the World OER Congress.

*The World OER Congress*

The culmination of the project was the 2012 World Open Educational Resources Congress that was held at UNESCO Headquarters, Paris from 20-22 June 2012. Over 400 delegates including representatives of governments, business, educators, NGOs and universities attended the event, which was organized as a partnership between UNESCO and COL. It was arranged in two parallel streams. One focussed primarily on government involvement in OER while the second gave OER practitioners from around the world a chance to present and discuss their experiences.
See: http://www.unesco.org/oercongress.

A decade after the term OER was first coined at a forum on open courseware for developing countries, the OER 'movement' gained a new maturity at this Congress in 2012 with the adoption of the Paris Declaration on OER (UNESCO, 2012b). As well as encouraging governments to promote and support OER for reasons that combine equity and sound economics, it asks them to ensure 'that educational materials developed with public funds be made available under open licenses'. As countries adopt such policies they will create a world in which, as never before, knowledge is the common wealth of humankind.

Conclusion

The enthusiasm shown at the 2012 World OER Congress suggested the continuing development of the OER movement will encourage collaboration and networking in the distance education community as never before. Throughout my 40-year career in distance learning colleagues have hailed the great potential for sharing materials. However the plain fact was that such sharing was very difficult in the days before materials were produced in digital format. Furthermore, most institutions did not organise the copyright aspects of their courseware with sharing in mind, creating another obstacle.

OER remove both these handicaps to sharing and, furthermore, we are already seeing OER being created through wide international collaboration, as in the Virtual University of Small States of the Commonwealth.

As institutions and governments use the Paris Declaration on OER as a basis for their policymaking, collaboration and networking will accelerate. Key aspects of the Paris Declaration (available at http://www.col.org/oercongress) urge governments to act in the following areas:

- Foster awareness and use of OER to widen access to education at all levels in a perspective of lifelong learning and to improve both the cost-efficiency and quality of teaching and learning outcomes.
- Facilitate enabling environments for use of ICT by promoting affordable broadband connectivity, widespread mobile technology and reliable electrical power supply.
- Reinforce the development of strategies and policies on OER within wider strategies for advancing education.
- Promote the understanding and use of open licensing frameworks so as to facilitate the re-use, revision, remixing and redistribution of educational materials across the world.
- Support capacity building for the sustainable development of quality learning materials. This means helping institutions to train and motivate teachers and other personnel to produce and share high-quality, accessible educational resources and encouraging the development of mechanisms for the assessment and certification of learning outcomes achieved through OER.

- Foster strategic alliances for OER and take advantage of evolving technology to create opportunities for sharing materials that have been released under an open license in diverse media.
- Encourage the development and adaptation of OER in a variety of languages and cultural contexts.
- Encourage research on OER, especially their impact on the quality and cost-efficiency of teaching and learning in order to strengthen the evidence base for public investment in OER.
- Facilitate finding, retrieving and sharing of OER by encouraging the development of user-friendly tools to locate and retrieve OER that are specific and relevant, using open standards to ensure interoperability and simplify the use of OER in diverse media, and finally:
- Encourage the open licensing of educational materials produced with public funds, with any restrictions they deem necessary.

This, you will agree, is a comprehensive agenda. However, since OER combine uniquely the high ideal of sharing human knowledge and the economic imperative of widening access to quality education at low cost, I believe that governments and institutions all over the world will take this exciting agenda forward.

I express the special hope that Mexico will lead the Spanish-speaking world in moving forward on OER since they have such obvious advantages as a catalyst for collaboration and networking within your very large language community. I wish you well in this endeavour.

Acknowledgement

It is a pleasure to acknowledge the great contribution made to the work described in this paper by Ms. Stamenka Uvalić-Trumbić, Senior Consultant to the project.

Note

The Commonwealth of Learning is constructing a comprehensive archival website for the project *Fostering Governmental Support for OER Internationally* that also includes links to other relevant material: see http://www.col.org/oercongress

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