

Accessibility and Facilitating e-Governance through Open Educational Resource Movement

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ABSTRACT

In the existing period, one of the most significant phenomena that the people have experienced in most of the aspects of life is the revolution of Information and Communication Technology (ICT). Honorable Prime Minister Shri Narendra Modi advocated, "Technology is a means to discover, learn, evolve and implement. Technology has a huge role to play in Minimum government, maximum governance Technology empowers the less empowered. If there is a strong force that brings a change in the lives of those on the margins it is technology. It serves as a leveler and a springboard...." Unlike traditional way, the Government of India is leading towards techno-friendly and increasing the use of technology for public administration for the governance of our country. Many governments across the world are laying great emphasis on delivering speedy and reliable service to citizens and businesses with the use of ICT. India is not too far behind; it has formulated e-Governance policy implemented programmes in different fields. E-Governance is a broader topic that deals with the whole spectrum of the relationship and networks within government regarding the usage and application of ICTs. Since education plays a significant and remedial role in balancing the socio-economic framework of the country, it is necessary to incorporate uses of e-governance in education sector. Some Web 2.0 tools pressured new productivity in T-L processes. This paper has designed to measure the accessibility, sustainability & Quality of higher education through OER movement.

Keywords: e-Governance, Open Educational Resources (OER), Web 2.0 tools

The development of the information society and the widespread diffusion of information technology give rise to new opportunities for learning. Higher educational institutions have been using the Internet and other digital technologies to develop and distribute education for several years. Yet, until recently, much of the learning materials were locked up behind passwords within proprietary systems, unreachable for outsiders. The open educational resource (OER) movement aims to break down such barriers and to encourage and enable freely sharing content. E-learning activities across tertiary education institutions are very diverse, from trivial online presence to programmes offered fully online. Modules accounted for the majority of e-learning activities, reflecting the dominant characteristic of e-learning as supplementary to on campus delivery

at undergraduate level. An apparently extraordinary trend is emerging. Although learning resources are often considered as key intellectual property in a competitive higher education world, more and more institutions and individuals are sharing digital learning resources over the Internet openly and without cost, as open educational resources (OER). Higher education is facing a number of challenges: globalisation, an aging society, growing competition between higher educational institutions both nationally and internationally, and rapid technological development. OER is itself one of these challenges, but may also be a sound strategy for individual institutions to meet them. The trend towards sharing software programmes (open source software) and research outcomes (open access publishing) is already so strong that it is generally

thought of as a movement. It is now complemented by the trend towards sharing learning resources—the open educational resources movement. *Giving Knowledge for Free* reveals the potential implications of the OER movement. OER is not only a fascinating technological development and potentially a major educational tool. It accelerates the blurring of formal and informal learning, and of educational and broader cultural activities. It raises basic philosophical issues to do with the nature of ownership, with the validation of knowledge and with concepts such as altruism and collective goods. It reaches into issues of property and its distribution across the globe. It offers the prospect of a radically new approach to the sharing of knowledge, at a time when effective use of knowledge is seen more and more as the key to economic success, for both individuals and nations. They can be an efficient way of promoting lifelong learning, both for individuals and for government, and can bridge the gap between non-formal, informal and formal learning.

Challenges for higher education

Four forces for change stand out in terms of their impact on higher education in the coming decades:

- Globalisation
- Demography
- New approaches to governance and
- Technology

(i) Globalisation: The globalisation of the world's economies is leading to increased permeability of national educational boundaries as well as greater emphasis on the internationalisation of curricula. The internationalisation of higher education seems to be a double-edged phenomenon, inducing growing collaboration and growing competition among countries and among institutional providers.

(ii) Demography: Most countries need to increase participation in higher education, but higher education institutions generally have not so far been able to meet this challenge. OER initiatives might serve higher educational institutions as vehicles for outreach to non-traditional groups of students, widening participation in higher education, and provide learning opportunities for those unable to use more traditional offerings or who is not part of

the traditional groups of higher education entrants. Such initiatives can bridge the gap between non-formal, informal and formal learning. At the same time OER can be used by professionals for in-service training and home study by older people, opening new lifelong learning strategies as a means of tackling the challenges of aging societies.

(iii) Changing governance: There is strong demand for better public management. Accountability, transparency, efficiency and effectiveness, responsiveness and forward vision are now considered the principal components of good public governance, which higher education institutions are being and will increasingly be asked to implement. In this respect institution-based OER initiatives can be said to cater for improved quality control through enhanced transparency and comparability between institutions, departments or individual faculty members as well as direct feedback from learners.

(iv) Technology and e-learning in higher education: The continuous development of information and communications technologies (ICT) is one of the drivers of the knowledge economy. Technology continues to gain ground in higher education and has already enhanced the on-campus student experience, through student portals, Internet access, digital libraries, and the availability of laptops, handhelds and other portable devices. E-learning is becoming part of the mainstream of educational programmes. Digital technologies have also dramatically changed academic research, thanks to the rapid acceleration of computer and network performance, which has allowed researchers to access and manipulate massive data sets, to simulate, model and visualise more complex systems, and to strengthen international communication and collaboration in research. Through the Internet, users participate and interact more and more to communicate and express themselves. This evolution, which uses the Internet's inherent capabilities more extensively, is best known as participative web (or Web 2.0). The OER phenomenon can be seen as the emergence of creative participation in the development of digital content in the education sector. Universities are gradually increasing their provision of e-learning and more students are signing up. The "e-learning" concept covers a wide range of systems, from

students using e-mail and accessing course work online while following a course on campus to programmes offered entirely online. The role of e-learning is growing, in terms both of courses offered fully on line or as blended learning and of quality of students' learning outcomes, which seem to be as good, or even better, than in face-to-face teaching.

What are open educational resources?

The definition of OER currently most often used is "digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". OER includes learning content, software tools to develop, use and distribute content, and implementation resources such as open licences. This report suggests that "open educational resources" refers to accumulated digital assets that can be adjusted and which provide benefits without restricting the possibilities for others to enjoy them.

Defining open educational resources

The term open educational resources first came into use at a conference hosted by UNESCO in 2002, defined as "the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes" (Johnstone, 2005). Open educational resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research. The definition shows that the concept of "open educational resources" is both broad and vague. A wide variety of objects and online materials can be classified as educational resources, from courses and course components, to museum collections, to open access journals and reference works.

Openness

"Open" has become somewhat of a buzz word which currently has positive associations for most people. According to Materu (2004), the present decade can be called the o-decade (open source, open systems, open standards, open archives, open everything) just as the 1990s were called the e-decade. The two most important aspects of

openness have to do with free availability over the Internet and as few restrictions as possible on the use of the resource, whether technical, legal or price barriers. How "open" should be interpreted in relation to OER. Walker defines it as "convenient, effective, affordable, and sustainable and available to every learner and teacher worldwide" "The 4 A's – accessible, appropriate, accredited, affordable" (Daniel, 2006). Downes (2006) argues that "the concept of 'open' entails, it seems, at a minimum, no cost to the consumer or user of the resource" and goes on. According to this definition, works that are "free" offer the following freedoms:

- The freedom to study the work and to apply knowledge acquired from it.
- The freedom to redistribute copies, in whole or in part, of the information or expression.
- The freedom to make improvements or other changes, and to release modified copies.
- The freedom to study and apply the information.
- The freedom to redistribute copies.

Educational

The term "educational" also needs to be clarified. Does it mean that only materials produced for use in formal educational settings should be included? If so, it would exclude resources produced outside schools or universities but used in formal courses, such as newspaper articles, and materials produced in such institutions but used for informal or non-formal learning outside. Downes (2006) argues that it ought not to be an *a priori* stipulation that something may, or may not be, an educational resource since learning extends beyond formal settings and resources used in a non-formal setting may still be instances of OER. The purpose of using OER in education is of course to enhance learning, notably a kind of learning that enables the development of both individual and social capabilities for understanding and acting. It is well established that OER are also used for informal or non-formal learning outside formal educational settings.

Resources

The dictionary definition of "resource" is a stock or supply of materials or assets that can be drawn on in order to function effectively. Digital resources,

which can be copied and used without destroying the stock, are non-rival or renewable resources. Learners also learn by creatively using resources not intended for learning purposes. A similar view might be taken by teachers, namely that an educational resource is “Anything that can be used to organise and support learning experiences”. In the context of computer-aided teaching and learning, resources are often understood as learning content that can be stored in a digital repository as a text, audio or video file. This view might in some cases be problematic, such as when different kinds of social software are used for discussions, cooperation and help and advice as part of the learning process.

Why are people sharing for free?

The reasons for individuals and institutions to use produce and share OER can be divided into basic technological, economic, social and legal drivers. The technological and economic drivers include improved, less costly and more user-friendly information technology infrastructure (such as broadband), hardware and software. Content is cheaper and easier to produce and costs can be further reduced by sharing.

There are three arguments for governments to support OER projects:

- ❑ They expand access to learning for everyone but most of all for non-traditional groups of students and thus widen participation in higher education.
- ❑ They can be an efficient way of promoting lifelong learning for both the individual and the government.
- ❑ They can bridge the gap between non-formal, informal and formal learning.

Institutions mention six types of reasons for being involved in OER projects:

- ❑ The altruistic argument that sharing knowledge is in line with academic traditions and a good thing to do.
- ❑ Educational institutions (particularly those publicly financed) should leverage taxpayers’ money by allowing free sharing and reuse of resources.

- ❑ Quality can be improved and the cost of content development reduced by sharing and reusing.
- ❑ It is good for the institution’s public relations to have an OER project as a showcase for attracting new students.
- ❑ There is a need to look for new cost recovery models as institutions experience growing competition.
- ❑ Open sharing will speed up the development of new learning resources, stimulate internal improvement, innovation and reuse and help the institution to keep good records of materials and their internal and external use.
- ❑ Free sharing can be good for economic or commercial reasons, as a way of getting publicity, reaching the market more quickly, gaining the first-mover advantage, etc.
- ❑ Sometimes it is not worth the effort to keep the resource closed. If it can be of value to other people one might just as well share it for free.

OER can be expected to affect curriculum, pedagogy and assessment. With thousands of courses from internationally reputed higher education institutions available for free, teachers will need to consider that students compare their curriculum with others. Since the teacher’s role as supplier of reading lists and teaching materials is diminishing, OER is likely to accelerate changes in the traditional teaching role and the evolution of more independent learners.

Drivers and Barriers

Before looking at motivations for participating in the OER movement, it is necessary to look at a number of drivers and barriers that set the basic conditions and are, for example, technical, economic, social, policy-oriented or legal (OECD, 2006).

- ❑ The technical drivers include:
 - ⊙ Increased broadband availability.
 - ⊙ Increased hard drive capacity and processing speeds coupled with lower costs.
 - ⊙ Rise of technologies to create, distribute and share content.
 - ⊙ Provision of simpler software tools for creating, editing and remixing.

- ⊙ Decreased cost and increased quality of consumer technology devices for audio, photo and video.
- ❑ Economic drivers include monetary incentives for sharing content for free and the emergence of new cost recovery models, wrapped around free content, for institutions and individuals. Other economic drivers are:
 - ⊙ Lower cost of broadband Internet connections.
 - ⊙ Lower costs and increased availability of tools for creating, editing and hosting content and lower entry barriers.
- ❑ Social drivers include the increased:
 - ⊙ Use of broadband
 - ⊙ The desire for interactivity
 - ⊙ The willingness to share, to contribute and to create online communities which is changing the media consumption habits of Internet users, particularly among younger age groups, *i.e.* 12-17 years old (OECD, 2006).
- ❑ Legal drivers include the rise of new legal means to create and distribute open tools and content through licensing schemes such as Creative Commons and the GNU Free Documentation Licence.

Barriers for using or producing OER can also be characterised as technical, economic, social, policy-oriented and legal. A technical barrier would be the lack of broadband availability. The lack of resources to invest in the hardware and software needed to

develop and share OER would be an economic barrier. Other economic barriers are difficulties for covering the costs of developing educational resources and sustaining an OER project in the long run. Technical and economic barriers are often mentioned as significant obstacles in developing countries. Social barriers include absence of skills to use the technical inventions mentioned as drivers and cultural obstacles against sharing or using resources developed by other teachers or institutions.

Sustainability Issues for OER Initiatives

Sustainability is not simply an economic matter, although this is important, but also involves issues such technical maintenance, organisation, content models and scaling possibilities. How these and other issues affect individual initiatives depends very much on the size of the project and its institutional and financial basis. At least three dimensions have an impact on how to approach the sustainability issues:

- ❑ The size of the operation (small or large)
- ❑ The type of provider (institution or community)
- ❑ The level of integration of users in the production process (co-production or producer-consumer model).

The Open Course initiative hosts mostly discipline-oriented communities that develop, evaluate and use open content. OER projects must find two unique types of sustainability:

- ❑ They must find a way to sustain the production and sharing of OER.

	Drivers	Inhibitors
Technical	<ul style="list-style-type: none"> ⊙ Increased Broadband availability ⊙ Increased Hard Drive Capacity & processing Speed ⊙ New & improved technologies to create distribute and share content 	Lack of Broadband other technical innovations
Economic	Lower cost for Broadband, hardware & Software	Lack of Resources to invest in broadband, hardware & Software
Social	Increased <ul style="list-style-type: none"> ⊙ use of broadband ⊙ Skills & willingness to share ⊙ Contribute & create online Communities 	Absence of: <ul style="list-style-type: none"> ⊙ Technical Skills ⊙ Unwillingness to share
Legal	New licensing regime facilitating sharing of free content	Prohibition to use copyrighted material without consent

- Of equal importance, they must find a way to sustain the use and reuse of their OER by end users (whether teachers or learners).

The challenges must be considered in two parts:

1. The sustainable production of OER
2. The sustainable sharing of resources

For the first part, producing OER requires human resources, workflow processes and supporting technology. At a minimum, someone must capture content, digitise it, check it for copyright issues, resolve copyright issues, and provide quality assurance of the final product.

All this involves computers, access to the network, and one or more supporting software tools. There are real costs involved in people's time, developing workflow policies, purchasing computers, connecting to the network, and acquiring and administering software. Meeting these costs is one part of the sustainability challenge.

For the second part, copies of the finalised OER must be distributed to end users. This can mean distribution of digital copies over the Internet, distribution of digital copies of the resources on physical media such as hard drives, DVDs and USB "thumb" drives, or printed paper copies. Each of these distribution methods has real costs, including bandwidth for distributing digital copies online, and media inventory, duplication and shipping costs for physical media and paper.

Improvement of Access and Usefulness of OER

(a) Validation of quality of open educational resources

The rapidly growing number of learning materials and repositories makes the issue of how to find the resources that are most relevant and of best quality a pressing one. There is a need for effective search and discovery tools. Items of interest to a teacher or researcher may not be part of library catalogues, federated databases or online journal subscriptions. There are technical solutions to this problem, such as attaching metadata (data about data or descriptive information about materials) to the resources to make them easier to find for harvesting machines utilised by users via search interfaces, just as library

cards help people to find the right books in a library. When there are too many results from a search for learning materials, it is difficult and time-consuming to find the resources that are most relevant and of highest quality. That is why techniques and technologies are developed to help give teachers and students options for narrowing their search. In the context of e-learning there is a large European network, called the European Foundation for Quality in e-Learning (EFQUEL), whose mission is to enhance the quality of e-learning in Europe by providing services and support to all stakeholders in the European e-learning community. They offer a roadmap for quality development in organisations such as universities or schools, consisting of four steps:

1. Needs analysis
2. Decision process
3. Realisation and
4. Incorporation

(b) Translation and localisation of content

"OER are cultural as much as educational, in that they give users an insight into culture-specific methods and approaches to teaching and learning" (Albright, 2005). This limits the relevance of the materials for non- English, non-Western settings. There is a risk that language barriers and cultural differences may consign less developed countries to the role of consumers of OER rather than contributors to the expansion of knowledge. Concern is also voiced that institutions in developing countries might become dependent on externally generated content, rather than have the content serve as a catalyst for the production of new, local OER. It is important to be aware of cultural and pedagogical differences between the original context of use and the intended new use of the material. In addition, translators are not necessarily instructors and may not have the pedagogical background needed to contribute new content effectively. Possible solutions would be to develop partnerships with local academics and institutions, to embed volunteer translators in OER service communities, and to create a multilingual platform that supports knowledge sharing between different parts of the world. The troublesome imbalance now existing between the provision of OER and its utilisation is aggravated by other

barriers for lower-income countries such as poor connectivity, inadequate infrastructure, funding constraints, local resource shortages, technical inadequacies and lack of training and support.

(c) Web access for disabled people

Since many OER projects have as their mission to broaden access to digital learning resources, people with disabilities of different kinds should be considered. Even though the Internet offers unprecedented access to information and interaction, most websites and web software still have accessibility barriers that make it difficult or impossible for millions of people with disabilities to use the Internet.

The accessibility barriers to print, audio and visual media can be overcome. A key principle of web accessibility is to design websites and software that are flexible enough to meet different user needs, preferences and situations. This also benefits people without disabilities in certain situations, such as people using a slow Internet connection, people with “temporary disabilities” such as a broken arm, and people with changing abilities due to aging. Examples of design requirements for people with different kinds of disabilities include:

- ❑ **Visual:** Descriptions of graphics or video; well-marked-up tables or frames; keyboard support, and screen reader compatibility.
- ❑ **Hearing:** Captioning for audio, supplemental illustration.
- ❑ **Physical, speech:** Keyboard or single-switch support; alternatives for speech input on voice portals.
- ❑ **Cognitive, neurological:** Consistent navigation, appropriate language level; illustration; no flickering designs.

Web Accessibility Initiative includes multimodality (support for visual, auditory, tactile access) which benefits users of mobile phones with small display screens and Web-TV. It also increases usability of websites in situations with low bandwidth (images are slow to download); noisy environments (difficult to hear the audio); screen glare (difficult to see the screen); driving (when eyes and hands are “busy”).

CONCLUSION

Education and science have a longstanding tradition of openness and sharing. The OER movement is but the latest example. However, when listing other motives for institutions to initiate OER projects, it becomes clear that what at first appears to be a paradox –giving intellectual property away in a competitive world – might actually be a way of handling a changing landscape for higher education. Institutions are experimenting with new ways of producing, using and distributing learning content, novel forms of covering their costs and more efficient ways of attracting students.

The same is true for individual teachers and researchers. Although the OER phenomenon is very recent, it is the subject of growing interest. No definite statistics are available, but it has expanded in terms of number of projects, number of people involved and number of resources available. It is a global development, although most resources are currently produced in developed countries. In spite of the lack of reliable figures, it can also be said that OER fosters international co-operation between institutions as well as peer-to-peer collaboration. OER initiatives, particularly those based in institutions, encourage transparency and can stimulate more quality control and competition to benefit individual learners as well as taxpayers generally.

In the discussion of incentives and barriers, a number of basic drivers and inhibitors were identified, as well as arguments for government funding of such projects and reasons for individuals and institutions to use and produce OER. It was concluded that with a strong technological push for more user involvement, and opportunities for both economic and noneconomic benefits for institutions as well as individuals.

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