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OER Movement: Quality Concern and Challenges

Dr. Manas Ranjan Panigrahi
Haramaya University, Africa
Email: manaseducation@gmail.com

Abstract

Learning is a lifelong process for every individual which can accomplish through different educational resources. Traditionally access of different educational resources was too difficult and record and disseminate so on. Information and Communication Technology (ICT) is now playing an important role for the dissemination of sustainable quality learning resources worldwide (Pal and Panigrahi, 2013). OER currently most often used is "digitized 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 licenses. It is also refers to accumulated digital assets that can be adjusted and which provide benefits without restricting the possibilities for others to enjoy them. Camilleri & Tannhäuser (2012) also stated OER as "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions". The limited restrictions are further described by Wiley (2009) in a 4R-framework of four rights i.e. 1. Reuse: the right to reuse the content only in its unaltered form; 2. Revise: the right to adapt, adjust, modify, or alter the content itself; 3. Remix: the right to combine the original or revised content with other content to create something new; 4. Redistribute: the right to make and share with others copies of the original content, your revisions, or your remixes. All the 4Rs giving rights of OER open. Evidences show that OER is a boon to the teaching learning world and became a necessary social infrastructure due to its access without cost. However, the premature death of many OER initiatives mandates our further attention to the quality dimensions and the solution to the challenges which grew along with this movement. Researches around the world are optimistic about the growth of OER's efficiency, relevancy and potential to promote creativity. This paper explores the benefits, the quality concerns and indicators, and concludes with suggestive continuum of models to make the quality of OER to the required level and meet the challenges.

Key words: Free Content, ICT, Open Educational Resources, Open Access License, Quality, Social Infrastructure, Teaching and Learning.

Introduction

Learning is a lifelong process for every individual which can be accomplished through different educational resources. Traditionally access to different educational resources, its recording and dissemination was difficult. However, information and Communication Technology (ICT) is now playing an important role for the dissemination of sustainable quality learning resources worldwide

(Pal and Panigrahi, 2013). ICT is defined as a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information. These technologies are computers, the Internet, broadcasting (radio and television), and telephone (Blurton, 2002). After the advent of ICT the teaching and learning process has virtually got revolutionized globally.

Although learning resources are often considered as key intellectual property in the global educational world, more and more institutions, academia and individuals are sharing digital learning resources over the internet openly and free of cost, as Open Educational Resources (OER). OER are often published on the internet within a repository. Repositories may be institutional, government funded, charitable or commercial, with most repositories offering a step-by-step guide to release (Hemingway, Angell, Hartwell and Heller, 2011). Digital teaching, learning, research resources in public domain or released under intellectual property license permit free use/repurposing by educators, students, self-learners and others (Chaney and Menn, 2013). Currently most often used definition of OER is “digitized 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 of resources such as open licenses. It also refers to accumulated digital assets that can be adjusted and which provides benefit without restricting the possibilities for others to enjoy them (OECD 2007). As described by Wiley (2006), the term “learning object” was coined in 1994 by Wayne Hodgins and quickly entered the vernacular of educators and instructional designers. As per the history of OER, learning objects popularized the idea that digital materials can be designed and produced so that they can be easily reused in a variety of pedagogical situations.

Camilleri & Tannhäuser (2012) also stated OER as “teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions”. The limited restrictions are further described by Wiley (2009) in a 4R-framework of four rights i.e. 1. *Reuse*: the right to reuse the content only in its unaltered form; 2. *Revise*: the right to adapt, adjust, modify, or alter the content itself; 3. *Remix*: the right to combine the original or revised content with other content to create something new; 4. *Redistribute*: the right to make and share with others copies of the original content, your revisions, or your remixes. All the 4Rs giving rights of OER open.

Role of OER in Teaching and Learning

The issue of learning content is open courseware, *i.e*. educational material organized as courses and typically distributed as PDF files, as well as smaller chunks of learning, often referred to as learning objects. The content may involve websites, simulations, text files, images, sound or videos in digital format, some only for use and others open for adaptation and reuse also. Although no definite statistics are available, there is a rapid expansion in the number of OER projects, as well as the number of people involved and the number of resources available.

Digital information has become a social infrastructure and with the expansion of the internet, network infrastructure has become an indispensable part of social life and industrial activities for mankind. Every day, new internet applications and more efficient ways of doing existing tasks

are being discovered. Although most internet applications are concentrated on a more efficient or cheaper way of performing existing tasks, the applications in education are mostly concerned with the sharing of scarce resources, available in one location, with many other locations (Pishva and Nishantha, 2008). As society moves further into the "Knowledge Age," everyday workplace practices are being increasingly changed and shaped by new and advancing technologies (Zurita and Nussbaum, 2004). In this fast changing information age even DVD player after 5 – 10 years in market has become history and YouTube and MTvU has taken its place (Berk, 2009). Globally students now tend to spend considerable amount of time on social media tools such as Facebook, YouTube, Twitter, blogging, wikis, Ebay etc. (Dubose, 2011). Today's 'Net Generation' of students is so sophisticated with technology that they have been branded as digital natives (Prensky, 2001). 'Digital' is their native language. They are 'native speakers' of the language of computers, video games, and the Internet. To match with this fast changing world scenario the classrooms of the 'Net Generation' students should also be upgrade to tap their multiple intelligences and learning styles. OER will be playing an important role in the future in dissemination of learning resources. The advantages many viz. i.) Grab learners' attention; ii.) Focus concentration; iii.) Generate interest; iv.) Create a sense of anticipation; v.) Energize or relax for learning exercise; vi.) Draw imagination; vii.) Improve attitudes toward content and learning; viii.) Build a connection with other scholars, educators and instructors; ix.) Increase memory of content; x.) Increase understanding of subject/ content; xi.) Foster creativity; xii.) Stimulate the flow of ideas; xiii.) Foster deeper learning; xiv.) Provide an opportunity for freedom of expression; xv.) Serve as a vehicle for collaboration; xvi.) Inspire and motivate; xvii.) Make learning fun; xviii.) Set an appropriate mood or tone; xiv.) Decrease anxiety and tension on scary topics; and xx.) Create memorable visual images.

OER will expand access to educational resources to more learners, more of the time. In particular, adult learners, students who work full time, and other nontraditional students stand to benefit from open resources because they are available for independent, self-directed study (EDUCAUSE, 2010). Open resources are one way to address the rising costs of education, and they also have the potential to facilitate new styles of teaching and learning. Giving faculty the ability to pick and choose the individual resources they want to use and to modify those resources and "assemble" them in unique ways promises greater diversity of learning environments. However, quality may be a concern for the users.

Quality Concerns and Indicators in OER

Quality of OER can be described by the following interdependent issues: i) Efficiently to achieve educational goals set, ii) Relevance of education in addressing the needs of the community and the environment, iii) Promote creativity and innovations. However, it can also describe quality in terms of: *Technical efficiency* (referring to teaching learning and pedagogical issues that focus on inputs, teaching skills/methodology, organization of school, curriculum content), and OER quality measures to be fulfilled continuously without interruption (ethical and professionally efficient teachers, curriculum (equitable, student centered, address country's need, maintain international standards), efficient organization and management system, availability of relevant educational support, adequate learning time).

Advocates of the open movement should consider actions for improving access to and usefulness of existing resources. The rapidly growing number of learning materials and repositories makes it important to find the most relevant and highest quality resources. *Metadata* (descriptive information about the resources) may improve the function of search engines, but adding good quality metadata to resources is difficult and time consuming.

Alternative approaches such as automatically generated metadata and folksonomies are being tested, but whether these are scaleable solutions remains to be seen. *Quality* can be improved in many ways. There is a troublesome imbalance between the *provision* of OER and its *utilization*. The vast majority of OER is in English and based on Western culture, and this limits their relevance and risks consigning less developed countries to playing the role of consumers. However, a number of projects now exist in developing countries to develop OER based on their own languages and cultures.

Since the concept of OER builds on the idea of reusing and repurposing materials, *interoperability* is a key issue. Learning resources need to be searchable across repositories and possible to download, integrate and adapt across platforms. Software applications developed at different points in time and by different developers should be able to operate together. Open standards makes this possible.

Quality improvement of OER can contribute a lot to the knowledge society as well as also develop curtain standard which can produce many learning resources. Particularly OER quality demands proper use of 4Rs i.e. Reuse, Revise, Remix and Redistribute process.

The quality indicators are the way forward of guidelines to create and development of the standards of OER. There are three kinds of ‘openness’ cover a range of academic functions, from production to organization to distribution, and their development and use in the academy offer great potential for shaping practices in teaching, research and management. Whether a matter of structure (*Open Sources*), protocols for informational organization (*Open Access*) or pure content (*Open Content*), the core principle undergirding all these forms of ‘openness’ is that we have a better information environment where the possibility of sharing is maximized (Fisher, 2006). If we will consider these are the three pillar of OER then it need to consider that these are it rendering towards the quality indicators. Open Source is a legal framework for the licensing of technology, wherein the rights of owning an artifact (such as a software package) entail rights not only to use it but also to be able to know and change the rudiments of its design. While there are many Open Source variants, the core notion is that one’s created intellectual property has a structural design that is transparent, such that it can be freely (without constraint or cost) manipulated or altered, generally towards the goal of improved versions of the design. Open Access is the organizing and presenting of freely-available scholarly materials on the Internet (and presumably any successor mode of information repository and delivery), according to a set of principles and protocols developed in information science. The original focus was on ‘gray’ materials such as pre-prints and e-prints; some new electronic journals now fit under this rubric (Bailey, 2005). Open Content is any unrestricted scholarly materials on the Internet, irrespective of whether they follow Open Access protocol or even fit the format of text-based media. Such materials include dissertation archives, teaching resources, interactive tools, general and specialized repositories, and materials supplementary to published articles such as illustrations or video and audio recordings.

Quality is a dominant issue in the literature. Those publishing OER may be concerned that their output is of a quality that reflects their professional capability and may feel that their reputation may be damaged by publishing OER, particularly where their resources do not 'translate' well to a virtual environment. The quality of repurposing and the adaptation of resources have been noted by commentators (Boulos; Marimba; and Wheeler, 2006). Practitioners also appear to be concerned to ensure that the OER they access online and use in teaching is of good quality. The literature notes that few repositories provide quality control measures, and even where these exist this issue may still be of concern (Littlejohn A). One solution is employed by MERLOT (Multimedia Resources for Online Learning and Teaching) where material is subjected to professional review. However, this has slowed down the release of resources so much that it has been described as 'a crisis in OER'. Certainly, delaying access to OER is contrary to the inherent philosophy and in itself may mean that resources are not up to date. It has been suggested that peer review and user communities might be possible ways to resolve some concerns regarding quality (Larsen and Vincent-Lancrin, 2005). However, it could also be argued that the perceived quality of a resource depends on the context in which it is being used, and users should therefore make their own judgment regarding its value and appropriateness. An alternative interpretation of the quality issue is that OER will in fact raise the quality of teaching resources. Organizational investment and control, the desire to maintain professional reputation and ongoing updating and repurposing by the OER community could be seen as effective in ensuring high-quality resources (Hylén, 2006). A number of ideas are coming out from the several literatures about the quality of OER.

Paul Kawachi, (2013) discussed in his paper about identification of OER quality assurance indicators which is observed from various literatures. More than thirty frameworks of quality dimensions were discovered in the literature, and fifteen of these were of sufficient merit and relevance to be then explored in detail to extract dimensions and sub-dimensions of quality related to learning materials. These frameworks are those reported by Achieve (2011), Bakken & Bridges (2011), Baya'a, Shehade & Baya'a (2009), Binns & Otto (2006), Camilleri & Tannhäuser (2012), CEMCA (2009), Ehlers (2012), Frydenberg (2002), Merisotis & Phipps (2000), Khan (2001), Khanna & Basak (2013), Kwak (2009), Latchem (2012), McGill (2012), Quality Matters Program (2011), and SREB Southern Regional Education Board (2001). After this in-depth study of these literatures and discussion with OER experts he suggested major five quality dimensions for OER with reference to educational objectives i.e. the Cognitive Domain, the Affective Domain, the Meta-cognitive Domain, the Environment Domain, and the Management Domain. Briefly the five Domains and their respective coverage are summarised below. Together these constitute a full comprehensive model of learning, to serve as the basis of OER quality Framework here.

Sl No.	Domains	Respective coverage
1	Cognitive Domain (Content)	the content knowledge, content skills, and reflective critical thinking skills to be learnt
2	Affective Domain (Students motivation)	the motivations, attitude and decision to initiate performance, learner independence and autonomy
3	Meta-cognitive Domain (Student autonomy)	understanding how the task is performed, and the ability to self-monitor, evaluate and plan own future learning

4	Environment Domain (Assess)	the localization, artistic presentation, language, multimedia, interactivity, and embedded links to other content
5	Management Domain (Packaging)	discoverability, tagging, including for time management, transmissibility, business models

Table 1 Comprehensive Descriptions of Five Domains Framework
Source: Paul Kawachi, (2013): http://cemca.org.in/ckfinder/userfiles/files/OERQ_TIPS_978-81-88770-07-6.pdf

On the basis of five-domain quality framework a shorter framework entitled TIPS was created, where the acronym TIPS is used to provide the top-level categorisation of criteria i.e. (T) Teaching and Learning, (I) Information and Content, (P) Presentation, and (S) System (Kawachi, 2013). At the same time this quality framework giving proper direction to develop open educational resources. It also help to develop and guideline for preparation of quality educational materials for the students, teachers and researchers.

Challenges and Limitations of OER: Focus on Issues of Developing World

OER can be seen as offering an affordable and credible solution to the growing disparity in education between developing and developed countries. Although the open resource revolution is growing, there are some challenges that may stifle the further progress of the movement. In this paper three challenges will be dealt: the copyright issues; how to assure quality in open content; and how to sustain OER initiatives in the longer run.

Copyright issues

Copyright is the right of the originator to control the publication and replication of work. Academia was mostly unaware of the copy right licensing even though the publication, consumption and distribution are known to them, when they were publishing in the print media. Internet and other digital media have changed this. According to McCracken (2006) having access to publishing and production tools, and by licensing access to a digital, ephemeral product rather than a physical object such as a book or print, researchers as well as teachers now interrelate with licensing as never before. And for the most part they seem either unprepared or unwilling to engage with cumbersome licensing procedures.

Mostly academics are happy to share their creative works, but without losing the credit or their rights. Although some people release work under the public domain, it is not unusual that authors would like to retain some rights over their work. The RoMEO project in UK made a survey in 2002 – 2003 among 542 researchers about what kind of rights they wanted to retain (Gadd, 2003). A majority (over 60%), were happy for third parties to display, print, save, excerpt from and give away their papers, but wanted this to be on the condition that they were attributed as the authors and that all copies were done so verbatim. 55% wanted to limit the usage of their works to educational and

non-commercialise. The RoMEO report concluded that the protection offered to research papers by copyright law is in excess of what is required by most academics.

Open licensing is a solution to the copy right worries of academicians. It offers a way out for controlled sharing with some rights confined to authors. There are several open content licenses such as Creative Commons and the GNU Free Documentation Licence which introduces a certainty and clarity in the process of obtaining permission to use the work of others. They also offer a reduced administrative burden of clear rights before use. Hence this is particularly useful in the educational context where users have little or no inside knowledge of the mechanisms used by the media industries. Finally, open licenses establish a body of works licensed as “open content” that may be freely shared. While these benefits are making them attractive, the right holders do not have a case by case control, but a ‘broad-sweep’ control over their works, put a shadow on open licensing. Another shortcoming to be mentioned is the waiving of moral rights to make derivative works. Even with these shortcomings, the international open licence is growing as evident from the bulk volume of objects delivered under the Creative Commons license. A recent comparison of seven Australian universities underpins previous international research showing that relying solely on voluntary deposits by academics of research articles to OA archives will result in approximately 15% contribution (Sale, 2006). Criteria to deposit the works of authors in an open archive should be tied with a policy to support authors to fetch more. Support to authors can be achieved by professional recognition and profile enhancement through OER contribution (Downes, 2007). Teachers need to feel that their efforts to develop OER will be recognized and rewarded in the same way as other academic outputs are valued (Lee et al., 2008).

Quality assurance

The inherent problem with the enormous digital resources available in the world is also applicable for OER. Consumers may be having great access to the digital world of information through this mode, but still the problem of judging their quality and relevance is there. The issue of quality assurance is fundamental and cannot be treated at depth in this paper. Instead a few different approaches to deal with the issue are listed below.

Branding is one of the approaches. Before releasing the resources on to the web, through internal check the institutions make sure the quality. Users have confidence in the brand/the institution’s prestige which will be at stake if quality is not there. However, this internal quality check is not open and hence the users may not follow it.

Yet another approach is peer review of the resources. As described in the section on OA, this technique is one of the most used quality assurance processes in academia. Being a well known and well understood routine, this may be an acceptable quality assurance for the consumers. There are also other arguments for using peer review schemes to guarantee the quality of resources in a repository. Taylor (2002) argues the process can be used to come to terms with the lack of a reward system by giving recognition and reward to the creator of a learning resource, as well as a dissemination method. Furthermore, there is a need for making the review decisions credible, and for that purpose an open peer review according to agreed criteria is well suited, Taylor claims.

A third quality management approach is to let individual users decide on whatever ground they like whether a learning resource is of high quality, useful, or good in any other respect. User rating/ comment on the resource or describing how they have used it, or by showing the number of downloads for each resource on the website may generate a trust in the users. This is a bottom-up approach often used on Internet based market places, music sites, etc., the validity of which is not dependable. However, such an approach would be justified in that quality is not an inherent part of a learning resource, but rather a contextual phenomenon that, the learning situation decides whether a resource is useful or not, and therefore it is the user who should be the judge.

Sustainability of OER

The abundance of OER attempts has created competition for funding. Some projects are having funding but it will end after few years, because these are only start up funds provided by the institution. There for it is imperative to seriously consider how it can be sustained in long run. There different kinds of OER providers and sustainability models. Hence there is a need to discover different approaches that might be useful in particular context. Two different approaches are discussed here as ideal types at each end of a continuum, where a lot of models could be invented between. These two are the institutional model and the community model.

The competition among institution based OER is growing. Hence they need to develop strong brand, user communities, frequent site usability and augmented quality of the resources offered. Community “marketing” is important for the institutional OER initiatives for several reasons:

- It enables users to form strong connections with the website;
- The institution can learn from the community about what works and what does not work on the website;
- It gives possibilities for rapid diffusion;
- Strong communities influence user behaviours – users come back to the repository.

Institutions launching OER programmes might also need to look into different revenue models for the long term stability and viability of their initiative. To this end some alternative models identified by Dholakia; King; and Baraniuk (2006) might be considered, such as:

- The *Replacement model*, where OER replaces other use and can benefit from the cost savings which is a result of the replacement. It was noted though that this model has a natural limit since it can only generate the same amount of resources as it replaces.
- The *Foundation*, *Donation* or *Endowment model*, where the funding for the operations are provided by an external actor such as foundations. This model was primarily seen as a start up model that will most probably not be viable in the long run. It might be transferred into a *Government support model*, which could be a long-term option in some (mostly European?) countries but not others.

- The *Segmentation model*, where the provider, simultaneously with resources for free, also provides "value-added" services to user segments and charges them for these services such as sales of paper copies, training and user support, ask-an-expert services etc. This model, together with the conversion model, is among the most used in the education sector.

- The *Conversion model*, where "you give something away for free and then convert the consumer to a paying customer".

- The *Voluntary support model*, which is based on fund-raising campaigns. Another version of this model is the Membership model where a coalition of interested parties organisations or individuals is invited to contribute a certain sum as seed money or on an annual basis.

- The *Contributor-Pay model* where the contributors pay the cost of maintaining the contribution, which the provider makes available for free. This model is used to give OA to scientific publications and might work also for OER.

The alternative approach to building an OER programme with a strong institutional backing is the community model. This is more of a grass roots activity where individuals contribute with their time, knowledge and resources on a voluntary basis. In this model, production, use and distribution are decentralised, compared to the institutional model where at least production and distribution are centralised. From a community perspective, one might take an alternative view on the over-all concept of sustainability. From this standpoint, it is not enough to look at the advantages and disadvantages of different revenue or funding models one should look not only at who pays for the resources but also who creates them, how they are distributed and how one can work with them. Some of the aspects to consider are:

- Technical considerations such as discoverability of the resources;

- The kind of openness and constraints on access and use that is given users;

- Different content models (the possibility to localise content) and issues of licensing;

- Different staffing models and incentives for people to contribute resources;

- Alternative workflows to the traditional design use evaluation model, to models without a clear distinction between production and use or between the user and the producer. The concept of coproduction is important here.

- Maintenance and updating of resources.

Since the community model builds on voluntary work and enthusiasts, sustainability is not so much a matter of financial resources as of dismantling barriers that hinders the community to flourish and grow. Tentative actions could be to find alternatives to the existing IPR regime and changing the mind set of donators not only to include funding to institutional OER initiatives but also to loosely composed communities. Authors (e.g. Geith & Vignare, 2008; Atwell, 2007) suggest that publicly funded organizations have a responsibility to share and disseminate information for the benefit of all. It should be their ethics to the knowledge community. For individual academicians this is their ethics, to participate in a community of practice around OER in which sharing of resources and expertise is expected and valued (Lee et al., 2008).

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