

Research Trends in Open Educational Resources (OER): A Review of Empirical Studies Published in Selected Journals from 2003 to 2013

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Abstract

Technological advancement and the integration of new technologies in teaching and learning have brought unprecedented changes to the delivery of education. Alongside this expansion in information and communication technologies, there has been a move towards sharing knowledge resulting in the birth of the Open Educational Resources (OER) movement. The movement was pioneered by global institutions such as MIT, UNESCO, OECD and Hewlett Foundation to promote collaboration and production of quality educational resources that is open and free for educators, students and self-learners to use and re-use for teaching, learning and research. Further, Creative Commons has added the intellectual property (IP) dimension which is now more amenable to academics as they can specify how they like their IP to be shared and used. OER has developed to a point where many institutions now provide, entire programmes, individual courses, modules and assessments on line. OER has also been described as part of a much larger social movement geared towards opening up what was previously regarded as closed and elitist, and open to only those who could pay for the access to use these resources. It has also spawned instructional design software and authoring tools that make teaching and learning manageable, thus spearheading the need to understand the status of research in this area. The aim of this paper, therefore, is to review research that has been conducted on Open Educational Resources (OER) in last decade. The understanding of the status of such emerging research would be helpful for educators and researchers in understanding the impact of OER, its progress and assist researchers in choosing appropriate topics for investigation. The research questions that guided this review were: What were the trends in OER studies published in selected journals from 2003 to 2013? What are the suggested trends for future OER's; and what are the challenges of OER research?

Key words: OER, Creative Commons, quality, open access, trends

Introduction

Advancements in information and communication technologies has led to the integration of technologies in teaching and learning receiving more and more attention. This, coupled with the increasing demand for higher education, makes it a focal point for the successful implementation of new technologies. Consequently, educators are increasingly expected to innovatively integrate technology into teaching and learning. Opening education to a wider audience and using ICT is seen as the most crucial influential factor for successful integration of technology into the teaching and learning process. The emergence and development of Open Educational Resources (OERs) can add great value to this venture. The Commonwealth of Learning (COL) has added a dimension to this definition, that is, “materials offered freely and openly to use and adapt for teaching, learning, development and research” (Commonwealth of Learning n d).

Openness suggests flexibility and easy access to information and data. The OER concept further includes availability of educational material over the Internet, repurposing content to meet individual needs and having appropriate technical and support infrastructure. This empowers educators to design and distribute individualized learning materials for learners to access and use at their own time and pace.

It is therefore important that educators understand how OERs have impacted teaching and learning. One way to understand the impact of OERs in education is to look at the overall provision of education. Along these lines, Conole (2012) states that understanding the value of OER “can be used to support inclusion”. Inclusion is a mandate of UNESCO as stated in the Millennium Development Goals “not to leave any child (person) out of the education scene”. In that vein, Caswell et al (2008), argue that OER promotes universal education as it allows access to more learners. Furthermore, Figel (2006) points out that, not only do OERs support lifelong education; they have the potential to attract a wider audience. In addition, Smith & Cassey (2006) observed that OER content may lead to high quality products as creators of content open up their materials to be used by others. These views present a strong argument that OER has potential not only to close the digital divide but to increase access and improve quality of education (Gourley & Lane 2009). Therefore the importance of integrating OER in education cannot be overemphasized.

This paper builds upon this notion of openness promoted by the OER movement which is building learning communities where members interact in groups and get opportunities to clarify concepts, reflect and deepen understanding.

The Nature of Open Educational Resources

As stated by a number of bodies (example, UNESCO , OECD, COL and OER Commons) open educational resources (OER) range from **open** courses, syllabi, assignments, tests and other educational resources such as lectures modules and study guides. These resources can be highly structured as in the case of text books or instances where the resources serves as a model and therefore should be used as is. However, in most cases OERs can be modified and repurposed to meet a particular need. Developments in information technology have ushered in new ways of sharing information thus providing different platforms for developing and sharing open educational resources. Another form of OER is digitized library collections. These have source materials that would normally be stored in a library. These materials can be used for research or to augment students' learning. The driving force behind OERs is the need to provide education freely and openly. Having discussed the nature of Open Educational Resources, it is important to understand the background from which these resources have come.

The Beginnings of OER Trends

In 1948 the United Nations declared that everyone has a right to education stating that “technical and professional education shall be made generally available” (Article 26, United Nations Declaration of Human Rights 1948). This declaration has led to initiatives where educators and researchers have searched for ways to make education more open and accessible. New technologies such as OERs and Open Courseware play a major role in making this vision achievable (Caswell et al 2008). It should be noted that the idea of ease of access and openness did not start with the advent of Open Educational Resources. Before then educators have tried several models among which is the Learning Objects. The term Learning Objects (LO) was first introduced by Hodgins in 1994 to refer to educational content packaged in chunks to present bits of knowledge that can be reused in different contexts. The term is defined variously by different scholars. Rehak & Mason (2003) define learning objects to mean “a digitized entity which can be used, re-used or referenced during technology supported learning”. On the other hand, Beck (2009) defines LO as units of learning between 2 and 15 minutes and goes on to add the following features of LO.

- They are self-contained
- They are reusable
- They can be aggregated
- They are tagged with metadata allowing content to be easily found by a search

Learning objects make it possible for a teacher to produce and share material. For instance, the Italian Research Council (2005) started a project known as Sharing Learning Objects in an Open Perspective (SLOOP) leading to what later became OpenLO and a Learning Management system called LOMS. The system allowed users to co-create content (Fulantelli et al, 2009).

The OER Movement

With further attempts to make education more open MIT announced its intention to put its courses online in 2001. This action opened up interest among other institutions of higher education to open access and share their resources with a wider community. This spelt the birth of the OER movement. The objective of the movement is to make educational resources freely available and be used by more learners and teachers. Since a rapidly growing number of people have access to the Internet and other web 2.0 tools, utilizing these tools for OER could mean access and empowerment for an even wider community. Social media and other participatory media provide a mechanism by which access to educational resources can be made.

In 2002, UNESCO hosted its first global forum on opening access to education. This is where the term Open Educational Resources (OER) was adopted. The definition of OER most commonly used according to OECD (2007, p. 30, is: “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” Different endeavors have been made since to promote use of open educational resources and UNESCO has supported many such initiatives. For instance, through the International Institute of Educational Planning (IIEP) UNESCO provides information about the concept of OER and aims to build capacity for institutions and individuals who want to adopt OER. It has also supported planning by creating awareness on the OER concept (D’Antoni, 2007). Further to this, the organization, in collaboration with the Hewlett Foundation, created an OER community to share information on production and use of OER. Finally, UNESCO is a member of the Open Educational Quality (OPAL) initiative whose aim is to improve quality by developing a Framework of OER practices (<http://www.unesco.org>). This is clear evidence of support and commitment for Open Educational Resources and opening access to education.

Building on this support, in 2009, the UNESCO Institute for Information Technologies in Education [IITE] launched its OER initiative to promote the use and uptake of OER in non-English speaking countries. The Institute focused on the design and implementation of programmes to on ICT application in education. These have led to further developments in research, policy analysis and conferences on different themes. The initiatives can be categorized into three as follows:

- a) An analytic aspect – which focuses on the use of OERs in the Commonwealth Baltic Independent States

- b) Capacity building - aimed at raising awareness on OER, increase literacy in copyright issues, train trainers and producers and facilitate networking among users.
- c) IT – aimed at establishing a multilingual web portal to support the diversity of languages and develop opportunities for sharing (Badarch, Kanyazeva, & Lane, (2012).

The Institute of Information Technologies in Education (IITE) supports bridging the digital gap and promotes inclusive education and sharing knowledge at national level. This is through building capacity and promoting e-learning environments which in turn make access easy and provide for lifelong learning. So the initiatives stated above were followed by a two year- study (2010-2011) on the status of OER which indicated that many OERs in the Baltic States were at their infancy with respect to both “adoption and use”. There were very few examples of good OER practices. Badarch, Kanyazeva, & Lane (2012) also found that infrastructural developments were not even resulting in very low use of ICT.

As part of an effort to support the uptake of Open Educational Resources, the OTTER (Open Transferable, Technology-enabled) project of Leicester University (UK) developed a framework for OER to promote the use and uptake of OER. This framework has four components namely: Process; Purpose; Product; Policy (Bossu, Ball & Brown cited in Conole, 2012). The OTTER OER framework has been recognized as an important theoretical foundation for technology integration research, and OER research. The understanding of the status of such emerging research would be helpful tool for educators and researchers in understanding the current OER research progress and choosing appropriate topics for further investigation, more so because developments in the OER movement seem to be very dynamic.

Impact of OER Trends on Teaching and Learning

Open Educational Resources does not only widen access to education, but affects the way that we have traditionally viewed teaching and learning. Lane (2010) in discussing the ways students use OpenLearn, notes that there is a changing relationship between teachers, learners and the institutions. OpenLearn empowers learners and provides flexibility for both learners and teachers. This flexibility is not as visible in traditional educational provisions because they are limited in resources and tend to thrive on being selective. Yet opening up resources exposes the learner to a wide range of resources. In that way OER reduces the educational divide and encourages more participation.

The social constructivist approach to learning and teaching promotes participation and learner-engagement with the view that learners are most likely to retain skill and knowledge they have acquired through participation. In fact, learner engagement and participation are central to effective teaching and learning. So, coming to open access and teaching, the Internet and social media have proved to be

among the best resources as they promote participation by encouraging learners to create and learn from each other. Thus, if learners are encouraged to create, adapt, peer- review and publish their work openly, they would sharpen the skills of critical thinking and independent learning.

Teaching and learning using OER can also be constraint if educators and students alike are not educated well enough on matters related to technicalities, availability and usefulness of OERs. In a study by Dhanarajan and Abeywardena (2013), two factors were identified as dissuading teachers from using OERs, namely technical (among others search and find digital resources, copyright issues, integrating OERs into LMS and technical infrastructure) and attitudinal (anxieties about plagiarism, quality and appropriateness of the OERs)

Emerging focus of OER

At its initial stages OERs tended to pay special attention to one type of user, the instructors. But of late this focus seems to shift to accommodate students who may be learners in an institution or the “self-learner”. For the latter, self-development and employability are the prime reasons for using OERs (OER Trends 2013). It gives them the freedom to choose what, where and how to learn. An off shoot development of OERs is the Massive Online Open Courses (MOOCs) which have made it possible for users to meet this need by providing personalized education leading to the user becoming a focal point of OER provision. MOOCs provide education beyond boundaries and open up learning so that it does not remain in the confines of the classroom or course.

We see from this trend a shift in how we should look at educational provision in Higher Education. This according to the OER Trend report (2013) suggests that the concept of OER has moved a step further in higher education. OER is no longer seen as a trendsetter but appears to be entering a new phase; the phase of adoption. By so doing it opens wide access to users in the form of open textbooks, use of mobile devices and apps. This is evidenced by the fact that there are now various platforms where users can access knowledge and information; there are a large number of MOOCs driving the need for more innovative technologies. Such openness gives users, especially learners, freedom to personalize their own learning.

On the same note, De Vries & Thuss (2013) consider higher education to be bracing up for more changes as new educational models emerge. In particular they are of the view that the use of mobile learning is gaining ground and thus can be fertile soil for implementation of OERs but do caution that “ most open content is not suitable for... use by students on mobile devices”. This is not only a challenge for learners but instructors as well in that authoring tools may not have ideal options to export content to mobile devices. Notwithstanding this misgiving, Tabuenca et al (2012) believe it is possible for OER repositories to provide ways in which content could be accessible through mobile devices. The results of their study, for instance, showed that content can be accessed from repositories via different mobile devices.

Challenges of Implementing OER

The growing demand for access propelled exponential growth in open educational resources. However this has not gone without challenges. These include scarcity of resources for students in developing countries, lack of understanding of IP issues and assessment of quality of OERs, to name a few. For example, in Africa, Wolfenden (2008) argues that “access to high quality pedagogically sound learning materials is frequently inhibited by the inability of African Educational institutions to afford them’ (p 6). On the contrary, Geser (2007), Hylan (2006) and Joyce (2006) note that OERs can alleviate the problem of cost in developing educational materials. On intellectual property rights and licensing, Materton and Wild (2011) found that many users of OER did not quite understand IP issues. Learners and educators did not know how to search for and evaluate open educational resources. Materton and Wild (2011) further observed that learners preferred online materials over printed material. However, as noted above, the preference did not go without reservations as they did not know how to search for and evaluate open educational resources. It implies a basic need for training on how to search for and evaluate OERs. Among other factors affecting the uptake of OER is the fact that many are not familiar with license provisions using, adapting and repurposing materials.

Another significant challenge in development of OERs is that the culture of sharing has not quite caught up among educators. While there may be a shift towards collaborative research, sharing teaching and learning materials still lags behind in many educational institutions. Many teachers and lecturers are reluctant to make their own materials publicly available online perhaps for fear of public scrutiny. McAndrew et al (2009) found it difficult to convince people that OpenLearn materials were free and can be re-used.

Taking note of the various challenges of OER use and adoption, Hill (2012) in (Educause Review) suggests that current systems have to resolve issues relating to revenue models, credentialing, badges, accreditation, course completion rates and student authentication”.

OER Implications for Instructional Design and Pedagogy

It is clear from this discussion that the developments in OER movement have some implications for instructional design, teaching and learning. Instructional designers and teachers alike have to be cognizant of the fact that OER affect not only the user but how the material is designed to meet the needs of the user. In this regard, OER trends shape instructional design and learning design. So “open” is no longer about accessing information but creating and providing quality re-usable resources.

Furthermore, there is a need for OER creators and users to have innovative ways in which OERs can be accessed. The Trends Report 2013 recommends that “repositories must become social” in order to allow

self-learners to comment on each other's work. This would not only benefit the learners but the instructors as well in the sense that self-learners can make comment to one another which could also benefit instructors (Fretter et al 2011).

Conclusion

Technological developments and the growing need to provide education for all have opened access to education resulting in an ever growing interest in Open and Educational Resources. Pressure to provide quality education propelled the creation of resources to be accessed by many. This move was mainly supported by the need to share knowledge in this knowledge economy. The technological developments mean new ways of integrating technology into teaching and learning such as using mobile technologies. This paper has discussed trends in open educational resources from 2003 to 2013 by reviewing articles published within this period. The review shows advancements in OER globally and adoption trends indicating that the OER movement is entering a stage of adoption. However, there are still some challenges to be addressed by institutions wishing to adopt OER. One of these challenges is to find ways to make OER sustainable especially in developing countries where cost is a major problem.

Other concerns relate to awareness on issues of copyright and licensing, quality and accreditation of OER programmes. There is therefore need to train users on IP and copyright issues and how this works once resources are open. It is also important to have clear assessment procedures and incentives for creators of OERs. This implies the need for more research on the actual use of OER by both learners and instructors.

References

- Badarch, D., Kanyazeva, S. & Lane, A. (2012). Introducing the Opportunities and Challenges of OER; The Case of Commonwealth Independent Baltic States. In Glennie, J. Harley, K. Butcher N & Van Wyk, T. (2012). *Educational resources and change in higher education: Reflections from Practice*. Commonwealth of Learning. Vancouver
- Beck, R. J. (2009). "What Are Learning Objects?". *Learning Objects, Center for International Education*, University of Wisconsin-Milwaukee. Retrieved 04/06 2013
- Caswell, T., Henson, S., Jensen, M. and Wiley, D. (2008). Open Educational Resources: enabling universal education. *International Review in Open and Distance Learning*. 9 (1). Accessed from: <http://www.irrodl.org/index.php/irrodl/article/view/469/1001>
- Conole, G. (2012). Fostering social inclusion through open educational resources (OER). *Distance Education*, 32:2 (131-134). Available at: <http://www.dx.doi.org/10.1080/01587919.2012.700563>

- Commonwealth of Learning. *Open Educational Resources (OER)*. Accessed from:
<http://www.col.org/resources/crsMaterials/Pages/OCW-OER.aspx>
- D'Antoni, S. (2007). "Open Educational Resources and Open Content for Higher Education. On-line roundtable. *Revista de Universidad y Sociedad del Conocimiento (RUSC)*. 4 (1) .UOC 03 /05/ 2013.<http://www.uoc.edu/rusc/4/1/dt/danonti.pdf> ISSN 1698 -580X
- De Vries, F.& Thuss, F. (2013). Mobile devices and apps as accelerators for OER. *Open Educational Resources Trend Report 2013*
- Figel, J. (2006). The Modernisation Agenda for Europe's Universities. *Dies address open Unoverisiteit Nederland*, 21 September 2006.
- Fretter, S. Barlanga, A. J. & Sloep, P. B. (2011). Peer – support and Open Educational Resources. In *Collaborative Learning 2.0. Open Educational Resources Book*. In P. Scott (Ed.) IGI Global.
- Fulantelli G., Gentile, M. Taibi D.& Allegr,M. (2009). Supporting communities of teachers in producing and sharing oer. *National Research Council of Italy, Institute for Educational Technologies, Italy*.
- Gajaraj, D. and Abeywardena, I. S (2013). Higher education and open educational resources in Asia: An overview Gajaraj, D. and Porter,D (2013) (Eds). *Open educational resources: an Asian perspective*, pp 3-18. Vancouver: Commonwealth of Learning
- Geser, G. (2007) Open educational practices and resources: the key role of social software. Proceedings of the EDEN Annual Conference, 2007.
- Gourley, B., & Lane, A. (2009). Re-invigorating openness at The Open University: The role of open educational resources. *Open Learning. The Journal of Open and Distance Learning*, 24(1), 57–65.
- Hill, P. (2012) Online Educational Delivery Models: A Descriptive View. *Educause Review*, 2012 - ERIC
- Hylén, J. (2006). Open educational resources: Opportunities and challenges. OECD's Centre for *Educational Research and Innovation*. Retrieved from <http://www.oecd.org/dataoecd/5/47/37351085.pdf>
- Joyce, A. (2006). *International Institute of Educational Planning. Internet discussion from : Open Educational Resources Findings from an OEDCD study*. Retrieved from http://oerwiki.iiep-unesco.org/images/e/eaOer_forum_report.pdf
- Lane, A. (2010). Designing for innovation around OER. *Journal of Interactive Media in Education*. Accessed from: <http://jime.open.ac.uk/jime/article/viewArticle/2010-2/html>
- McAndrew, P., Santos, A., Lane, A., Godwin, S., Okada, A., Wilson, T., Connolly, T., Ferreira, G., Buckingham Shum, S., Bretts, J. & Webb, R. (2009). *OpenLearn Research Report 2006-2008*. The Open University, Milton Keynes, England. <http://oro.open.ac.uk/17513/> accessed June 5, 2013.
- Masterton, L., & Wild, J.(2011). OER impact study: Research report. JISC Open Educational Resources Programme: Phase 2. Retrieved from <http://www.tall.ox.ac.uk/research/past/OERImpact> accessed June 5, 2013.
- OECD (2007). Giving knowledge for free: the emergence of open educational resources. Retrieved from : <http://www.oecd.org/edu/cei/38654317.pdf>
- Rehak, D. R., Mason, R. (2003) Keeping the learning in learning objects, in Littlejohn, A. (Ed.) *Reusing online resources: a sustainable approach to e-Learning*. Kogan Page, London, 2003. (pp.22-30).

Smith, M. S., & Cassey, C. M. (2006), September/October). The Promise of Open Educational Resources. *Change*, 8-17.

Tabuenca, B., Draschler, H., Ternier, S. & Specht, M. (2012). OER in the Mobile Era: Content Repositories' Features for Mobile Devices and Future Trends. *eLearning Papers*. ISSN: 1887-1542. www.elearning papers.eu no 32. December 2012.

UNESCO. (2002). *Forum on the impact of Open Courseware for Higher Education in Developing Countries: Final Report*. Paris: UNESCO.

UNESCO, (n. d.) *Open Educational Resources*. Accessed from:

<http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/>

Wolfenden, F. (2008). The TESSA OER Experience: Building sustainable models of production and user implementation. *Journal of Interactive Media in Education* (3) 1-6 Retrieved from <http://jime.open.ac.uk/2008/jie-2008-03.html>.