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Freeing up access to learning: the role for Open Educational Resources

By Prof. Murilo Matos Mendonça – UnisulVirtual, Brazil; Dr Patrick McAndrew – The Open University, UK; Dr Andreia Inamorado dos Santos – The Open University, UK

Muril.Mendoca@unisul.br

Abstract

The internet revolution of the last few years has had an impact on how we all live our lives. So it is not surprising that this is also a time of change in attitudes towards how we learn. Free access to information through computer networks has expanded, and part of that information flow are materials designed to help people learn. In addition there are many further online resources that help the learning process, even if that was not the original aim. However, there are risks in this evolution in access to information both for the end user, who can be confused by the options available to them, and to those involved in providing education, who may see their traditional role changing and becoming harder to perform. This situation provides the background for a growing movement to directly consider how education can be provided in a freer and more open way. This has been termed “Open Educational Resources” (OER). The exact definition of the term depends on interpretation, however a useful statement was provided as an outcome from an event organized by UNESCO in 2002 as:

“OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge (Atkins, Brown and Hammond, 2007, p4).”

Arguably the only difference between an online learning object and an open educational resource is the declaration that it is open. This may be true but that turns out to be a powerful difference. By being open the content can be accessed by any learner who can do so, it can be taken and run in new contexts, it can be reworked by others and adapted for local needs (with the result shared back if desired), it can be made part of shared pool of resources, it can be the shared point of reference for collaboration, and it can be the key to building policies that work in different domain. The aim of this contribution is to draw the readers’ attention to a few relevant aspects regarding the OER track record, its current state of affairs and possible future directions.

Keywords: OER movement, Creative Commons, Finding OER, OER Impact, OER Use and Re-Use, OER Sustainability

1. The OER Movement and the Movement of OER: from the Web 1.0 to the Web 2.0 and beyond

As people move from career to career, or advance in the same career, they will often realise that the knowledge and skills required from them are no longer only those gained from previous education experience (Brown and Adler, 2008). Today's world is one where knowledge and skills have to be acquired on an almost continuous basis, driven both by rapid development in many areas and the versatility necessary for multi-tasking in others. In other words, knowledge and skills need frequent updating – or constant “maintenance and recycling” in a process of lifelong learning.

At the same time, it is unwise to ignore the indications that the campus-based educational infrastructure now in place is no longer enough to cope with the ever-growing demand for higher and continuing education (Oblinger, 2008). The resources and capacity available are not enough to meet that demand (Brown and Adler, 2008). Additionally, attention is needed to the ways in which education is approached. Traditional teaching and learning methods alone may sometimes be neither suitable nor sufficient to prepare students, learners and apprentices for the kind of life, society and challenges to be faced by them not only in a predicted future but also in the present time. This is not to say that those methods and approaches ought to be disregarded altogether. Instead, they should be adapted and/or combined with new ones as a transition takes place, during which different ways of delivering education need to coexist. Teaching and learning models can, therefore, rely on both traditional and technology-enhanced methods. Various combinations or hybrid models can be shaped. Such combinations ideally are contextually driven, i.e., they are based on local teaching and learning needs and possibilities. The context we are living in has to accommodate this spectrum ranging from unidirectional to multidirectional ways of approaching education.

With that in mind, a series of OER initiatives have been launched over the past few years which have laid down the foundations and provided alternatives that diversify the ways in which education is delivered and (e-)learning is supported. This changing scenario can be compared to a construction site that undergoes visible changes with almost each passing day. The Internet provides the terrain where the building blocks of knowledge are being (re)shaped, laid and (re)arranged. The Internet is itself a source of inspiration inasmuch as it is a platform which enables this fast-paced transformation to take place (Brown and Adler, 2008). It serves as a global structure which has greatly widened access to a plethora of resources, including educational materials. The Internet has nurtured a culture of sharing whereby information is made openly available with relatively few constraints as regards access and cost. When the information released on the Web (or elsewhere) is of an educational nature, such OER offer a chance to enhance traditional conceptions of learning (e.g., how and from what sources to learn), teaching (e.g., where, how and whom to teach) – and of education in a broader sense (e.g., formal, non-formal and continuing).

The Web 1.0, the original World Wide Web, which developed during the mid-1990s, expanded access to information to a previously unimagined degree. In this Web 1.0 phase of the Internet, OER played an important role in the dissemination of educational content. Although the Web 1.0 boosted information dissemination to unprecedented

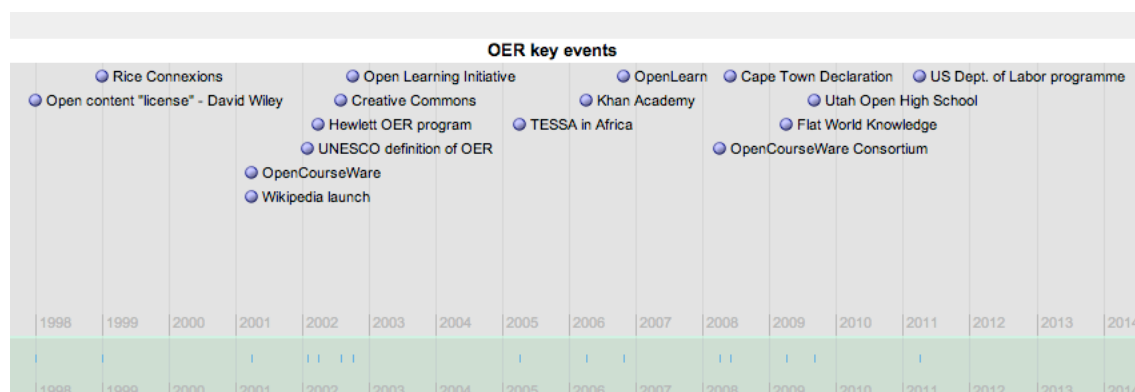
levels and the OER movement took advantage of it, the provision of such resources was mostly unilateral, top-down from *the* providers to the consumers – retaining them as two clear-cut, distinguishable groups.

Termed Web 2.0, the latest evolution of the Internet has caused concrete shifts of paradigms as it takes a leap forward towards revolutionising not only access to information but also interaction between users and providers of information. The Web 2.0 brings in tools through which users can reach out to and be in touch with each other, thereby fostering the creation of a culture of interaction, exchange and participation. Additionally, it enables a multidirectional type of provision of information, which means one can be a (re)user and a provider of information at the same time.

It is precisely because of the emergence of this user-centred approach and its underlying participatory culture that the advent of Web 2.0 has a considerable impact on the OER movement. It is making it possible for OER initiatives to transcend from an inception focused mostly on open content provision to another phase, one of knowledge sharing and exchange. This new phase entails content provision and use but also opens doors to collaborative processes. And the outcomes of such processes can be potentially rich and beneficial for both users and providers. Moreover, the divide between providers and users might at times change into a blurred line and at others, into a continuum. Web 2.0-based OER could make room for dynamical, “effervescent” knowledge exchange processes to take place. This raises great expectations and offers many possibilities.

2. Impact of OER

The claim that OER makes a difference is borne out by the track record of OER. The definition slightly trailed the formation of the open movement itself with existing milestones described at the 2011 OCWC Global conference (Casserly, 2011) from the declaration of how to licence open content in 1998 (Wiley, 1998) through to in 2011 the US Department of Labor \$2billion call for the community college sector to support return to employment where the use of an open licence is specified for all materials.



Key events in OER (based on Casserly (2011))

MIT OCW launched in 2001 and celebrated its 10th anniversary in Spring 2011 making the OER movement relatively recent. However its impact is already impressive at individual, institutional and policy levels. What underlies this track record and the importance of being aware of OER is the additional value that has been gained from openness. In the next sections

we will look at how the OER Movement matches to other changes in the use of the Internet, review some of the characteristics of OER, and consider some key examples.

3. Finding out about OER

There are many different types of OER and the best way to find out about them may well be to use an index or search to help find OER that meet a particular need. Table X gives some of the examples of starting points for such a search.

Name	URL	Description
Jorum DiscoverEd	http://www.jorum.ac.uk/DiscoverEd	"Discover the Universe of Open Educational Resources"
OCWFinder	http://www.ocwfinder.org/	"Search, recommend, collaborate, remix"
OER Commons	http://www.oercommons.org/	"Find Free-to-Use Teaching and Learning Content from around the World. Organize K-12 Lessons, College Courses, and more."
Temoa	http://www.temoa.info	"a knowledge hub that eases a public and multilingual catalog of Open Educational Resources (OER) ..."
Xpert	http://xpert.nottigham.ac.uk/	"University Learning = OCW+OER = Free custom search engine - a meta-search engine incorporating many different OER repositories ..."
OER Dynamic Search Engine		a wiki page of OER sites with accompanied search engine

OER Search Resources (adapted from <http://openeducationalresources.pbworks.com>)

A brief history of some of the key sites also indicates the sort of content that is available and the motivations of those providing them.

MIT OpenCourseWare: Launched as a service in April 2011 MIT OCW is considered by many to be the initiator of the move to offering open resources. From the start MIT OCW had a commitment to offering material from all of its courses, and it was able to claim to have met this target in 2008. MIT is a campus based university so some of the courses have limited materials however across the range it has released lecture room videos that are entertaining and enlightening, simulations, texts and assignments. The original model was of transfer to other educational institutions and MIT OCW material is established in teaching programmes in Africa and India. A recent innovation is to link some of the courses to open study groups (run by openstudy.org). MIT OCW has a very high level of exposure attracting over a million visitors each month and this has meant that there are enough interested learners to provide highly active self study groups. Interesting resources to find include: video lectures by Prof Walter Lewin, large scale learning in Introduction to Computer Science, and use of images in Visualizing Cultures.

Connexions: Established in 1999, before MIT OCW, Connexions offers an open publishing platform that enables anyone to build up either individual units of learning or to collect together existing units to build a course. Connexions provides the concept of an open textbook that can either be shared online for free or provided in print through a commercial partner offering print on demand. Interesting examples include the electrical engineering course released by the originators, Rice University and the music courses developed independently by a music teacher based on their own enthusiasm to share tuition ideas.

OpenLearn: OpenLearn, launched in October 2006, is the OER site of the Open University in the UK and was designed from the start to enable users to have a learning experience using the content and tools of the site. As a distance education institution the Open University was able to release material designed for self learning that offers a task-based structure so the primary users targeted by the system are learner. OpenLearn also supports educators by providing a LabSpace where reworked content or new learning materials can be uploaded. More recently OpenLearn has integrated other free to access material from the Open University that are linked to supporting its existing broadcast television presence and the release of multi-media assets through iTunesU. Examples of content on OpenLearn include its language materials (such as Beginner's Chinese), mathematics such as understanding graphs, and science from earthquakes to evolution.

UnisulVirtual: UnisulVirtual is an example of a site that is taking advantage of the opportunities offered by OER. Starting from 2007 the decision was made to use OER to extend the offerings from virtual learning site established by UniSul in Brazil. Unlike the previous examples UniSul was initially a consumer of OER, rather than producer. Use and reuse of OER is a sensible position to adopt to widen the base of materials in use and take advantage of the investment of others released for free. UnisulVirtual provides an interesting example as it also became a translator of OER and producer of new OER available in both Portuguese and English. These were shared back through OpenLearn.

OpenCourseWare Consortium: working in OER is a collaborative activity and this was recognized in 2008 with the formal founding of the OpenCourseWare Consortium. The consortium has more than 200 members in 2011. An initial drive has been to increase the level of content available by requiring each institutional member to commit to release ten courses of open content. This condition is now being relaxed in recognition of the variety of actions that can help the adoption and use of OER. The OpenCourseWare Consortium also organizes conference and through its website offers toolkits to help organizations become involved and address any barriers.

There are many other examples of projects and sites that are working with OER. These include including PhET (Physics simulations), Khan Academy (short and simple explanations for mathematics and other topics), TESSA (joint development of teaching support materials for Sub-Saharan Africa), WikiWijs (Netherlands initiative to provide broad curriculum (in Dutch)), UKOER (a UK based programme running since 2009 with a rolling set of short projects addressing most aspects of OER), P2PU (building free cohort-based courses around OER and volunteer teachers) and Universia (collaborative support for Spanish speaking universities working on OpenCourseWare). The diversity of provision is well represented in the 2011 awards from OCWC, individual winners cover such fields as medicine, music, ancient history, and Law, and come from Spain, Costa Rica, US, South Africa and Turkey (OCWC, 2011).

4. Making OER open

A key element of working in an open way is to take care to communicate the permissions and rights that you are giving others. This is a contrast to – just putting it on the web. For many individual users such permissions are often ignored on the assumption that it can be accessed then everything is permitted. However for use to be sustained and supported by

reputable institutions the situation is much better if permissions are both stated and clearly communicated. The first open content licence for education material was written in 1998 (Wiley, 1998) and set out the principle that copyright is not waived but instead permission is given for the content to be used as needed. The development of the CC license has coded this approach and enabled a common basis internationally.

Creative Commons provides a method to specify the permission that is given with three forms for each licence: electronic, legally specified and described in understandable language. The main attributes that are relevant for OER are attribution (identifying the creator of the resources), Non-commercial (limiting the rights for others to charge for the resource), and No-derivatives (the resource should not be altered). The licence that gives most permission for reuse of OER is to only require attribution (often referred to as CC-BY). Other options can be appropriate but should only be used with care to take full advantage of open access. (McAndrew & Cropper, 2011).

5. OER Use and Re-Use

The possibilities of interaction inherent to the Web 2.0 represent an enormous potential for the OER movement to flourish. In spite of moving and evolving alongside with the Web itself (1.0 → 2.0), there are certain crucial aspects regarding OER which need to be carefully looked into and observed as they unfold. Such aspects help reveal the intricacies of OER use and re-use.

The extent to which OER can be taken up for use and re-use may be influenced by the following overlapping factors: language, translation, localisation, cultural and cross-cultural issues and sustainability of OER initiatives. Each of these aspects raises issues for research, many of which depend on allowing the necessary time to pass for use and re-use cycles to take place and significant evidence and data can be collected and analysed. The factors are also inter-related, given the characteristics of the Web 2.0, which supports many possibilities of provision, use and re-use of OER.

6. Linguistic and Cultural Issues Related to OER Use and Re-Use

This section addresses questions related to the importance of doing translation of OER in different languages combined with content adaptation to local contexts. It also discusses cultural issues from a variety of standpoints from which to look at culture. The overall objective is to draw attention to the fact the both linguistic and cultural aspects directly affect OER use and re-use and, therefore, OER usefulness.

Although many countries of different continents participate in the OER movement today (Wiley, 2007), the UK and the USA stand out in terms of number of OER initiatives and provision. This may be in part because of funding opportunities which were available in those countries. The MIT was a pioneer through its OCW and helped to raise awareness to the relevance of OER and encourage transfer of free learning material between universities. In the UK, the Open University received a grant from The William and Hewlett Flora Foundation to support the OpenLearn project during its first two years (Santos, McAndrew and Godwin, 2008).

English-speaking countries outnumber non-Anglophone ones in the OER movement. Consequently, English is the language that typifies global OER (Stacey, 2007). At the same time that the OER movement is ‘going global’, it would be equally desirable for it to go ‘glocal’ (global but adjusted matched to local requirements). This would particularly recognize the need to accommodate most of the world’s learning population that do not speak English. If use and re-use are a major concern, arguably *the* very reason for the OER movement to exist, then it has to be clear that the language of OER is a primary and decisive factor affecting their usability and, thus, their usefulness.

Content translation would no doubt be of great service to reach across the linguistic chasm that makes many OER inaccessible to millions of people who speak different languages. Translation may indeed prove extremely useful for populations who have limited access to educational content in general even in their native tongue. It would be the first step to be taken in making OER accessible ‘glocally’. However, translation alone could not account for the intended meaning in the content. So how could OER be made not only accessible locally, but also meaningful?

In order to arrive at an answer to that question, a simple metaphorical comparison could be drawn. When someone is thirsty, one would not simply give them ‘any’ water. They would give them filtered, treated – drinking – water. Analogously, when users translate open educational content from one language into another so that it can be re-used, they should not merely transpose the linguistic dimension if they intend to convey true meaningfulness. Rather, they ought to also *localise* that content, i.e., “filter”, “treat”, adapt the educational resources to the learners’ local context and reality. By doing so, they would be making them suitable for helping to “quench the thirst” for knowledge and education. Such localisation is an important component for the process of ‘glocalisation’ of OER, where content has to be not only accessible, but genuinely meaningful and hence (re)usable.

It is worth noting that localisation is not necessarily coupled with translation. It may well be required even in instances where language is not an obstacle to be overcome. For example, in the case of countries which share the same language but, nonetheless, have each their own *culture* and educational traditions, or regions of the same country which display their own cultural idiosyncrasies. To localise in this sense is, therefore, to make cultural adaptations to OER, whether translated or not, so as to make them meaningful to their target audience.

The aspects regarding translation and localisation so far approached are but the tip of the iceberg as regards OER use and re-use. One should not mistake localisation for removing the elements of the foreign culture during the cultural adaptation process intended for further OER re-use. Retaining elements of the source culture could be seen as a window on multiculturalism. OER offer a rich set of sources of educational material for cross-cultural, comparative studies. However, when users translate without re-contextualising, they might be missing out on the very opportunity for re-use.

Translation and localisation are a vital part of the promotion of content use and re-use and so is original open content stemming from a variety of countries and languages for more multidirectional cultural exchanges to take place. Undoubtedly, this is one of the aspirations of the OER movement in the long run.

UnisulVirtual from Brazil, through a dynamic collaboration with The Open University's OpenLearn, provide an example of embracing various cultural opportunities arising from OER translation and localisation. Taking as a starting point the fact that there are eight Portuguese-speaking countries in the world, which are home to a combined population of over 240 million people, UnisulVirtual set out to translate and localise selected educational materials from OpenLearn, where it later republished and shared its localised translations in the area set aside for collaborators. At the same time, UnisulVirtual was providing some of its own courses originally written in Portuguese, targeted at the same audience. Later, they moved on to providing also some translations into English of some of their original courses so as to reach non-Lusophone audiences as well.

The cultural dimension of the OER movement is large in scope and comprises facets other than content localisation to suit the culture of different geographical areas or communities. OER cultural issues encompass more than sharing domain knowledge. They also involve teaching and learning practices as OER can also expose teaching and learning methods, tools and techniques employed in their structuring, thereby providing practical insights as to how courses are built in specific source cultures. In that sense, OER can be regarded as an open door to diversity and inclusion, offering those who get involved a way to share back from their own perspectives (Stacey, 2007). Thus, localising OER and sharing them back, for example, may be a way of promoting a culturally diverse exchange of teaching and learning practices by means of debates and dialogue enriched with cross- or multicultural contextual elements.

When teachers undertake to release their courses and teaching materials as OER, (re)usability of those materials may vary greatly according to the way in which those materials are structured and/or the audience they have in mind. Some teachers may tend to be concerned about how adequate their materials would be for a potential group of learners who are no longer “under control” inside of a classroom which holds a limited number of students assisted through sessions held on a regular basis. Some release their class notes as they may have different audiences in mind, such as other teachers, for example, who would be able to fill the content gaps between the notes. Or it may be the case that some teachers simply want to contribute and will give away what they have, regardless of having an intended audience.

In the absence of time and space delimitations of traditional education, it would be desirable if teachers (whether as users or as providers) could approach OER from a cultural exchange point of view. From such a stance, culture would then be understood as the values manifested through course organisation, topics, readings and assessment. Here, again, a central issue would be how to use OER in ways that would allow for and, moreover, foster contributions from developing countries to avoid exporting and promoting culture in a unilateral, dominant fashion.

In regard to “teacher culture” or teacher ethos, the idea that their materials may become visible to potentially millions of people can be seen as stimulating by some and as discouraging by some others. Based on the MIT experience, Attwood (2009) reports that teachers are proud of the work they do and, therefore, cater to the various aspects related to quality. Typically, they will check that their materials will be as up-to-date as possible before release and such attentiveness then ends up driving up the quality of their own classes. On the other hand, engaging faculty in giving away their materials to

OER projects may prove a challenge, because such contributions are the result of voluntary participation. Cultural, behavioural changes such as this take time. Ideally, sharing teaching materials could eventually become part of what would be taken for granted as a teacher's praxis.

The promotion of use and re-use of open educational content is of chief importance to the OER movement and can be enhanced through the tools and possibilities of interaction offered by the Web 2.0. However, a better understanding of how OER are taken up and (re)used also depends on observation of and research on the linguistic and cultural aspects implicated.

7. Sustainability of OER Initiatives

The OER movement has recently completed its first decade as an identified movement, with already a considerable number of OER initiatives and projects underway in different parts of the world. Such initiatives vary in terms of orientation, management and affordance (Dholakia, King and Baraniuk, 2006). Regardless of their individual characteristics, they are all faced with one specific challenge: how to secure their sustainability – and, therefore, their continuity. And as the movement increases, so do concerns about how to maintain OER projects in the long term – so much so that sustainability has come to be regarded as a key issue for any OER initiative (Santos, McAndrew and Godwin, 2008) and is seen as deserving almost as much emphasis as has been given to educational content value and technical basis.

In a stricter sense, the term sustainability evokes the idea of ability to keep something in existence. Though intrinsic to the concept of sustainability, this one aspect *per se* would not suffice as the intention is to go beyond the notion of mere continuation to encompass aspects such as meaningfulness and relevance. These other facets of sustainability, although subtler than that of longevity, need to be addressed. Otherwise, given the nature of OER, why sustaining projects that is meaningless or irrelevant in its objectives?

Any institution or person who in some way or other engages in an OER initiative as either a provider or a user (or both) is likely to have as their primary goal to continually offer and/or obtain content imbued with meaning, with relevance – with value! This is the perspective from which *sustainability* will be addressed throughout this section, i.e. as the ability of an initiative to continuously and simultaneously sustain both its existence and the achievement of its goals.

If OER initiatives are to be aligned with this approach to sustainability, they must devise strategies to permanently support their two major pillars, namely their processes and their purposes. Processes are all the aspects regarding the production and the sharing of the educational resources intended to be open. Purposes are established based on if and how those resources can be used once they become open.

Sustainability of OER Processes

OER production entails the allocation of human resources and follows from the assumption that technological infrastructure should either be in place or be provided.

Personnel requirements will vary but there must be a minimum that can cope with the basic steps involved in OER production, i.e. selecting content, capturing it, digitising it, clearing intellectual property issues, checking for quality and sharing/uploading/distributing content. More complex production processes may also involve content translation, localisation and adaptation – whether cultural-, didactical- or accessibility-related.

OER sharing demands careful planning and clear policies. Although OER are made available mostly online, one must take into account different contexts and realities which may require the employment of alternative media, such as CDs, DVDs or USB memory sticks where access to the Internet and the Web is scarce and even the use of printed material where widespread access to computers is not the norm.

Clearly, there are real, monetary costs attached to hiring people and providing the conditions for the work expected from them to be feasible. Also, sharing content, be it “simply” by uploading it to a web-based platform or producing and distributing physical copies of it, will generate immediate expenditure.

Sustainability of OER Purposes

Setting the production and sharing processes into motion could be said to be only halfway through towards completion of the sustainability cycle which ensures long life to an OER project. The second half of this cycle is, to a large extent, a consequence of how well structured and implemented the first phase was and relies on a project’s ability to attain its purposes. A project’s purposes are established by *if and how OER can be used*. Projects could inadvertently invest in the production and sharing of resources which might turn out not to be user-friendly, accessible, useful, relevant or even interesting at all. In order for a project to avoid such pitfalls and make sure that it will get through to its end users, OER should be: made available through far-reaching, accessible environments and/or media; rendered in easy-to-use formats; targeted at well-defined audiences. It is by observing these basic guidelines that an initiative will succeed in creating opportunities for OER use. That does not mean, however, that a project’s purposes have been attained and that the sustainability cycle is complete. OER are, by nature, about the sharing, availability, use, transformation and re-use of knowledge. Therefore, a truly comprehensive project must also allow for the re-use of the content it provides by sourcing it in such a way that it can be localised, translated and/or adapted and in such a place where users can show and share and have feedback on their re-used versions – and, why not, socialise their own original resources, thereby initiating a network of collaborative associations.

Again, real costs are implicated in making all of these mechanisms operational and challenge a project’s ability to move beyond survival towards the achievement of its goals.

Within the context of OER endeavours, processes and purposes are mutually complementary in that there would be no point in putting efforts towards releasing educational content if hardly anyone were to not only use it but also use it in significant ways. Similarly, it would make no sense for people to spend their time and energy searching for educational resources which are not consistent as to their availability as

well as their value. It is in the symbiotic balance between processes and purposes that a project will find the path that leads to sustainability.

Incentive-Based and Funding-Based Sustainability

Just as the term sustainability conjures up the notion of permanence, it will also convey the idea of costs, as was just mentioned when the real costs related to the processes and purposes of a project were pointed out. Notwithstanding, in order to remain coherent with the approach adopted here, sustainability is addressed from a slightly broader angle – one which certainly analyses value in monetary terms but also allows for its more abstract nature, i.e. value seen as intangible worth.

Incentive-Based Sustainability

An overall notion of ‘selflessness’ (or philanthropy) could be said to be inherent to the nature of OER-related activities in that they have to do with giving away, sharing, opening, (ex)changing and socialising. Given these intrinsic features, it is worth noting that, particularly as regards OER initiatives, sustainability is not necessarily all about money.

If on the one hand, one cannot be as naïve as to turn a blind eye to the fact that cost-recovery strategies must be developed and deployed and that money has to be brought into OER initiatives, on the other hand, one cannot close one’s eyes either to the fact that it is possible to meet and mitigate part of the real costs through sources other than the monetary ones. Human resources account for the highest costs involved in OER projects (Wiley, 2007) and it is precisely through human resources that those very costs can be reduced. It is not uncommon for people to volunteer to do things in exchange not for money but for different types of rewards with intangible value. This does not mean (nor does it exclude, though) altruism. Take, for example, faculty, who could easily find enough motivation in the possibility of academic research and/or projection. Or students interested in accumulating credits towards their degree. Or staff seeking an opportunity to develop specific skills and advance in their career. These are but a few examples of what could motivate people to engage in non-remunerated OER projects which were chosen in order to draw attention to an incentive-based model of sustainability.

Once the possibility of relying upon an incentive-based approach to sustainability has been pointed out, money issues need to be tackled as well.

Funding-Based Sustainability

Despite the possibility of bringing incentive-oriented strategies into play, it is often true that a model of sustainability based on incentives to engage volunteers may not suffice and that, therefore, costs will still remain that need to be met. Projects will then have to consider a funding-based model of sustainability to suit their needs. Thus, an outline is provided of a variety of funding models presented by Dholakia, King and Baraniuk (2006) and by Downes (2006) as possibilities of financial support to OER initiatives.

Funding Models from Dholakia, King and Baraniuk

- *Substitution Model:* what configures this model is that the educational content stored, disseminated and re-used through an OER project frequently replaces the use of additional technology or infrastructure such as software, course management systems, virtual learning environments and websites when a project already have all of those in place as is often the case of educational institutions, or it will collaborate with and be hosted by another project which supplies technology and infrastructure. The cost savings resulting thereof can be converted into a source of funding to a project. UnisulVirtual, from Brazil, draws on this model as it opted for collaborating with The Open University UK by hosting its OER output within OpenLearn. And the National Council of Professors of Educational Administration (NCPEA) is developing a Connexions knowledge based in school leadership and administration which will supplant their printed material output capacity.
- *Partnership Model:* when an OER initiative achieves significant growth and representativeness in a given area of knowledge, audience reach, geographical area or language(s), for example, and builds partnerships with different organisations and institutions, it could try and seek funding from foundations, philanthropic institutions, government and/or non-government agencies, trade or industry groups and/or individual firms whose activities are in consonance with those of the project. Identifying underserved segments and targeting the project's endeavours towards serving such segments could lead to the creation of a differentiated brand image and therefore, to the implementation of this model. Consortia would be a variant of this model, where universities and institutions would pay a fee for affiliation to a project and be entitled to its joint development and ownership.
- *Segmentation Model:* this model stems from the idea that, in addition to providing people with open access to educational content, a project could also offer them 'added-value' services, such as tailored, individual, group or corporate tutoring, previous knowledge assessment and certification (Gourley and Lane, 2009; Santos, 2009) or sales of printed copies of specialised content selected/compiled based around a given topic, for example.
- *Voluntary Support Model:* on this model, the strategy consists basically of applying fund-raising methods with the aim of obtaining contributions from conscientious users of a certain project in order to financially support its operation.

It is necessary to remark, as pointed out by Dholakia, King and Baraniuk (2006), that the funding models presented here demand and are based on the assumption that the OER projects will count on a considerable contingent of engaged users.

Funding Models from Downes

- *Endowment Model:* on this model, base funding needs to be raised and the interest generated from those funds is used to pay for the operational costs of the project. This is the model used by The Stanford Encyclopedia of Philosophy and which resulted in an operational budget of US\$ 190,000.
- *Membership Model:* on this model, a project joins a consortium by either contributing seed capital to it or paying an annual subscription, thus becoming entitled to certain privileges, such as access to sensitive information prior to its general release. The Sakai Educational Partners Program is an example of a project using this model.
- *Donations Model:* on this model, a project will seek donations from the community at large and the donations obtained will then be managed by a non-profit organisation which can use them for operating expenses or convert them into an endowment. Examples of projects whose funding stemmed mostly or partly from donations are: MIT OpenCourseWare Consortium, the Apache Foundation and Wikipedia.
- *Conversion Model:* on this model, a project offers users a product or service free of charge, expecting them to convert into paying users in the future or provide users with a free basic product or service, and supply paid for advanced versions or features such as installation, support or further tools, as is the practice amongst Linux distributors, for example. Elgg's funding model also fits in this category. And in the educational sphere, this model was adopted by the Learning Activity Management System.
- *Contributor-Pay Model:* this is a model in which content contributors pay for the costs of providing and maintaining their contributions to a repository committed to ensuring free, open access to end users. This model is in use by the Public Library of Science.
- *Sponsorship Model:* this model relies on companies interested in sponsoring educational projects, often partnered with educational institutions, as this kind of support usually results in positive repercussions in terms of publicity and reputation. Examples of this model include the MIT iCampus Outreach Initiative, sponsored by Microsoft, and the Stanford on iTunes Project, sponsored by Apple.
- *Institutional Model:* this model is adopted by institutions which decide to take on the responsibility for their OER project and self-fund it by resorting to their own budget. Oftentimes, educational institutions will allow for and set aside funds to be allocated to projects which fall under the scope of their mission, whose fulfilment justifies the expenditure. After a two-year period (2006-2007) of seed funding provided by the William and Flora Hewlett foundation combined with partial self-funding (Santos, 2009), The Open University UK adopted the institutional model in order to take upon itself the maintenance of its

OpenLearn portal. Also, the OpenCourseWare Consortium derives funds to its operational budget from MIT's regular budget.

- *Governmental Model:* on this model, government agencies undertake to finance OER projects in order to benefit their citizens as a means of creating more learning opportunities and widening access to education. Examples of initiatives supported through this model are Projeto Folhas, financed by the Government of the State of Paraná, Brazil, and Canada's SchoolNet project.

Attention is drawn by Wiley (2007) to how few of the aforementioned examples include educational projects as opposed to software enterprises. He cites Wikipedia and the OpenCourseWare Consortium as examples of projects efficient in obtaining donations (and mentions that despite the fact that OCWC still relies on MIT's funding provision from its own budget, it still depends to a large extent on donations). He also reports that Canada's SchoolNet project ceased its activities in 2007 and emphasises that the Public Library of Science appears to have adopted sustainable models, however based on the premise that the publication input by researchers will remain steady and that market investments will be enhanced.

There is a number of different funding models which may be adopted and adapted by OER projects and it will often be the case that more than one model will be used to suit the needs of a project, as those needs will range greatly according to project size, context and purpose. What most projects have in common, though, is the urgency to identify one or more such models and implement them, lest they should die away and be abandoned along the way. In order to avoid that fate, it is imperative that OER initiatives intent on flourishing observe the sustainability strategies being employed by other projects formerly grant-funded which now have to find other ways to maintain momentum and walk on.

8. Concluding Thoughts

This short discussion has aimed to draw the readers' attention to a few relevant aspects regarding the OER track record, its current state of affairs and possible future directions. It does not offer all the answers to the questions it raises. Rather, this article is intended at informing and is an invitation to reflection as well. And as such, a few final issues are presented for pondering over and further questions will be put forward for consideration.

Fast-paced technology advancements such as the Web 2.0 have fostered the emergence of a participatory culture typified by interaction, collaboration, sharing, exchanging and progressive degrees of openness. This participatory culture both creates and calls for new ways of learning which Higher Education cannot neglect if it is to respond to local and global educational needs. It is true that the new ways of learning build on practices and knowledge acquired in school. But it is also true that they make ample room for continuous, autonomous, lifelong learning that crosses over the boundaries of formal education. Brown and Adler (2008) use the term "learning 2.0" to refer to these new ways of learning that arise from a Web 2.0-based participatory culture and take place in open, interactive environments. Aware of that, many universities have undertaken sharing educational content openly. Despite the fact that the provision of OER can

contribute to the fulfilment of their mission and might even serve the additional purpose of recruiting students (Friesen, 2009), universities still need to do more. They must consider other ways of approaching education in order to keep up with such cultural changes. Gourley and Lane (2010) remark that perhaps in a not too distant future universities may start conducting paid for assessment of non-formally acquired knowledge. They also stress the need for efforts towards an effective articulation between formal and non-formal learning. Santos (2009) mentions that institutions might have to resort to alternative OER sustainability strategies by relying on specific services such as individual or group tutoring, sales of specialised materials and paid for assessment of self-taught knowledge and skills counting towards a degree.

In general, it could be said that making open educational content available for people to use does not pose major technical difficulties. However, as the OER movement grows, so does the need to know who benefits and how (Lane, 2008). More and more individuals are faced with the need and/or desire of self-improvement and/or self-fulfilment through education. OER can help to respond to such needs and aspirations in that it widens access to educational resources to those in pursuit of lifelong and self-learning goals. OER do not impose admission barriers, tuition fees or fixed learning paths. Rather, they are a gateway to self-paced, autonomous learning. In spite of all the possibilities that they offer, OER still have a long way to go before they achieve widespread audiences. Given the recent introduction of OER, relatively few people outside and even inside the academic environment are aware of their existence. In addition, users at large typically have a low awareness of open content as a category. Identifying OER users and understanding how some of them progress from occasional information browsers to goal-oriented learners is essential. Therefore, comprehensive research is needed in order to find ways of raising awareness to and exploring the potential benefits and advantages of OER for both users and providers.

There are numerous questions being currently raised by those investigating OER impact on users. Thus, research on qualitative and quantitative use of OER is of primary importance. A challenge for researchers is the (f)actuality that the fewer the obstacles put to use, the less can be known about it. In other words, tracking users is a complex and time-consuming task which requires the allocation of resources and personnel. However laborious, it is a crucial task that needs to be carried out.

The current OER scenario is permeated by a series of fundamental issues that have yet to be extensively investigated and debated, as follows. OER use and re-use needs to be more clearly defined. There is often some degree of overlapping between use and re-use. Terms used to refer to types of re-use such as repurposing, reversioning, remixing and localising would need to be better specified. Overlapping is to be expected also between providers and users. These are not always two clear-cut categories and, therefore, establishing who the users are in different contexts is critical for research purposes. It is important to identify and understand how, where, when, why and if OER use is happening (or not).

What openness means and to whom is itself debatable. Addressing the questions above will help determine the future directions of the OER movement and help higher education institutions to assume their new roles as mediators of knowledge within the context of educational openness. Whether as a matter of coincidence or not, when OER initiatives are collectively referred to as the OER movement, this lexical choice sounds

particularly (as opposed to generally) appropriate in the sense that the word movement conveys the idea of displacement, of (ex)changing positions. Indeed this lies at the heart of the OER movement: the hope that in time it will be possible to move towards a shift for the better from the *status quo* of education.

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