OERs in Context – Case Study of Innovation and Sustainability of Educational Practices at the University of Mauritius

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Abstract

Over the recent years, there has been a growing interest in Open Educational Resources (OER). A similar trend was observed about a decade ago in the concept of Learning Objects, which inevitably faded without really making an impact in real-world educational contexts. A number of repositories were created that contain thousands of learning objects. However, on the consumption side, very little is known in terms of their implementations and impacts on teaching and learning. The same phenomenon is observed with Open Education Educational resources which are by definition learning objects but they are freely available resources available for educators and practitioners to use, reuse, remix and re-contextualise in local contexts. While the use of OER is widespread among educators (similarly to learning objects), however they often happen in discretion, isolation and not really in well-established frameworks (pedagogical, economical and institutional). This paper presents a case study of how OERs have been included in a sustainable and innovative teaching and learning model in three online courses at Diploma, Bachelor and Masters Level. It shows how the inclusion of OERs helped maintain a good quality level, sustain a viable economic model with reduction of tuition fees for learners, increase access and achieve the intended learning outcomes without any negative impact on the learners' experience.

Keywords

Open source, Case study, Practice, OERs, Sustainable Education Model

Introduction

Open educational resources are defined by the Wikipedia community as being basically content, instructional approaches, activities and other resources, available for free and that are believed to be useful in educational contexts. The idea behind the concept is to promote access to education to a wider audience, especially those from deprived regions of the world, where the open resources can be freely reused, improved and repurposed to fit in different contexts. Currently most OERs are generated by Educational organizations, usually Universities, using new or existing grant funding to do so (Lane, 2008).

While the use of OER is widespread among educators (similarly to learning objects) as shown by some empirical research (MIT, 2006; Petrides et al., 2006), however they often happen in discretion, isolation and not really in well-established pedagogical, economical and institutional frameworks. Additional research, according to Petrides & Jimes (2006) has indicated that while educators and learners are accessing and using OER materials, they are less likely to take part in other behaviors including sharing their own content, reusing other's content, and creating content collaboratively.

Lane (2008) argues on the need for sustainability much beyond the funding of projects related to OERs. Furthermore, Wiley (2006) argues that the sustainability of OER projects in Universities will be achieved by making OERs part of the normal fabric of the University's business, whether that is around teaching and learning, research and/or business and community engagement activities.

This paper describes the model developed and currently in use at the University of Mauritius in the same line of vision to achieve sustainable education through the use of OERs. The origin of the activity stems from an EU-ACP funded project named SideCAP regrouping partners from the Island states of the Commonwealth, and led by the Open University of the UK. It shows how the University is trying to cope with the different challenges as posed by OERs but at the same time its experiences in the use OERs to achieve its operational objectives such as the need to reduce costs, maintaining quality and increasing access to University education.

A Review of Open Educational Resources (OERs) and Related Issues

Learning objects describe any chunk of *decontextualized* learning information, digital or non-digital, such as an image, text, video, educational game or sound files. The aim of those entities is to provide a tremendous set of learning knowledge that once developed can be exchanged among organizations, and be used to build up several individual lessons and courses (McGreal and Roberts, 2001). The key factor for this flexibility is not performed by the physical learning object itself but by its standardized description or more precise its metadata specification (Rumetshofer and Wöß, 2003). As cited in IEEE (IEEE, 2002)

Learning Object Metadata (LOM) specification:

> *A metadata instance for a learning object describes relevant characteristics of the learning object to which it applies. Such characteristics can be regrouped in general, life cycle, meta-metadata, educational, technical, rights, relation, annotation, and classification categories.*

Learning objects are often used as components to assemble larger learning modules or complete courses, depending on different educational needs. Assembling of these learning objects is also known as *content packaging* and is mainly done to provide a standardized way (metadata standards) to exchange digital learning resources between different learning systems. Packaging of learning objects of low granularity (for example, a web page) into larger granularity objects (such as a chapter) is similar to the *LEGO bricks* approach that provides kids with a set of *decontextualized* small granularity objects (Wiley, 2000). The kids in turn assemble (*contextualize*) the relevant bricks to form, say a model of a house. Using learning objects to construct sections, chapters of modules and eventually curriculum, is analogous to the Lego bricks approach.

On the other hand, open-education resources are basically everything in terms of freely available learning material and resources that can be categorized as learning objects. However, from working definitions and metadata standards that exist, a learning object can also be proprietary and copyrighted.

While a number of initiatives were taken in this area such as the MIT OCW (Massachusetts Institute of Technology Open Courseware), the Commonwealth of Learning VUSSC (Virtual University for Small Island States of the Commonwealth) initiative promoting open content through the WikiEducator environment and the OER Commons, little is known about the inherent issues related to the instructional design process based on the use of open educational resources. Furthermore, different universities have different frameworks for courseware development and therefore reuse and repurposing of the content is not process which is as straightforward as it seems thereby potentially giving rise quality assurance issues (European Schoolnet, 2006). There are also culture related constraints as supported by a report from UNESCO that argues that OERs are cultural as much as educational, in that they give users an insight into culture-specific methods and approaches to teaching and learning (Albright, 2005).

The first major element of concern is the Intellectual Property issue. While different open educational resources may adopt different variations of the "copyleft" licensing approaches, different types of constraints and issues might arise during the dissemination of the finished material especially if the finished product is used for commercial purposes. Furthermore, it is not clear what type of licensing would therefore be "ethically" and/or "legally" suitable for the final product. Copyleft is basically a play on the word copyright that removes certain or all restrictions imposed by copyright on a work. An example is the Creative Commons set of licenses that can be used to release materials with certain rights reserved.

While instructional design processes usually tend to be structured and rigorous processes with well established methodologies, it is not still clear how such approaches fit for the design of courseware based on open educational materials. The simple reason is that the courseware already exists and in a variety of format. Therefore instructional design should not focus on creation of materials but rather reuse of existing materials. These existing materials might not be instructionally appropriate in the sense that the standard procedures were not followed for the creation of these. Furthermore, the focus of proponents of open educational resources is coherent with web 2.0 concepts where internet users are no longer only "*infosumers*" (information consumers) but are also actively engaged in the creation and dissemination of information and knowledge online. However, the critical success factor of such movements is based on the momentum that mass participation of content creators will bring.

The paradox to this is that content creators mainly from third world, developing countries and especially junior academics would be reluctant to contribute their "own" materials implying intellectual property for free to be exploited by third parties unless some kind of reward is presented. As a result, the movement may not experience the exponential growth expected and from observation and local experiences, there has been a similar problem faced by the communities of practice that were pushing forward the idea of reusable learning objects. This observation is shared by Petrides and Jimes (2006, pg 1) who argue that while the "emergence of OER has started to open up avenues for educators and students to select and adapt learning resources that meet their unique teaching and learning needs, the question still remains as to how much of this new paradigm is being realized".

The cost of running OER projects is an important element in the sustainability of such initiatives. In fact the costs vary considerably and are very high. For instance, the OpenLearn Project of the Open University in the UK had a budget of almost USD 5 million a year for the first two years (OECD, 2007). On the other hand, from the same source, it is mentioned that the OCW project of the University of the Western Cape in South Africa runs its operation with three staff and approximately USD 44000 a year. While it is important to point out that real costs can be met with resources other than money, most initiatives need to raise some money some of the time (OECD, 2007). Downes (2006) and Dholakia et al. (2006) have identified a variety of options to explore. These are the (1) replacement model; (2) foundation, donation or endowment model; (3) segmentation model; (4) conversion model; (5) voluntary support model; (6) contributor pays model. However, each OER initiative is unique and no single model will fit all. There is indeed a need to discover the different approaches that might be suitable in a local context (OECD, 2007).

There are also pertinent issues related to quality, adaptability and reusability of the online materials that

are available to educators. These issues are similar to those raised concerning learning objects as open education resources are basically learning objects. There is currently no standard format in which OER materials are posted online. A variety of PDF, PowerPoint presentation, with only bullet points, some reading references and in some cases detailed notes are available. There is therefore the need to establish a framework for making the materials more "acceptable". In the same line of thought, there exists a kind of mismatch in the interoperability of various qualifications framework of stakeholders, therefore adding to the complexity of the process. The lack of common taxonomy among the various metadata schemes that have been created adds a significant barrier to the problem (OECD, 2007).

OER-Based Courseware Authoring Life Cycle at the University of Mauritius

The VUSSC (Virtual University for Small States of the Commonwealth) community through the WikiEducator portal proposes a 5-Step life cycle model for OER courseware development as follows: *Find, Compose, Adapt, Use* and *Share.* Throughout the experimentation within the SideCAP project, the lifecycle that emerged from the processes had the following steps namely: *Prepare, Search and Classify, (re-)purpose, Value Addition, Publish and Deliver, Review.* The main differences between these two models is that the SideCAP model takes into account the pedagogical needs and requirements (*prepare phase)* of a particular course before searching for resources that are available. The VUSSC model, on the other hand, assumes that requirements are already known. The SideCAP model has merged the Contextualisation phase to include "Compose and Adapt" phase as in the VUSSC model as it is perceived that the repurposing of the content needs take place in parallel when the material is being composed from the OERs. There is another phase whose importance has emerged during the different experimentations with OER. This is the value-addition phase which according to the SideCAP model is a different concept from "repurposing" or "(re-)contextualisation" or "adapt" processes. A high level description of the lifecycle model is described below:

- ### *Prepare*
  - Module Specifications Sheet (Outline, Duration, Learning Outcomes, Assessment Criteria, Learning Units Description).
  - Context of Use (whether mainstream educational system through programmes of studies or short professional development courses or both).
  - Identify type of Open Licensing to be used.
  - Selection of the pedagogical strategy and instructional techniques.

- ### *Search and Classify*
  - Identify repositories to be used (e.g. Openlearn, Connexions, MIT, OERCommons, WikiEducator or Wikipedia etc).
  - Look for related content – browse metadata, check licence type, check content quality, level, format, pedagogical approach, duration etc.
  - Build a checklist of available content – classify according to the pertinent criteria above or as per one's requirements.
  - Identify what is missing and what needs to be added, developed from scratch and/or adapted/repurposed/recontextualized.

- ### *(re-)Purpose*
  - Decontextualize highly adapted learning content.
  - Rewrite material that is not contextually correct, write new materials to cater for those that are missing, and/or mix materials from different sources.
  - Add context-related learning activities that meet the pedagogical approach selected.

- ### *Value Addition*
  - Add new learning/pedagogical scenarios that improve the learning experience of learners.
  - Provide multiple modalities (such as animations and multimedia) for learning to suit individual preferences of learners (such as learning/cognitive styles).
  - Provide multiple access/delivery modes to increase accessibility to learners with different constraints such as internet connection, limited bandwidth etc.

- ### *Publish and Deliver*
  - Publish on e-learning platform, stand-alone websites, and CD/DVD formats.
  - Deliver the course to target audience.
  - Monitor the learner progress and achievements and provide tutoring/technical support.
  - Share in the different OER repositories or simply put the content available on your local website and let others know about it.

- ### *Review*
  - Gather feedback from learners on the course.
  - Review content to improve the course for subsequent cohorts.
  - Restart the cycle if there are changing requirements and/or to keep up-to-date with ongoing developments in the area or to check for other OERs that have been published or improved. Note that successive cycles might span over a much shorter time frame except if module syllabus is reviewed in depth.

Irrespective of which lifecycle model is used in the context of courseware authoring using open resources, its importance remains as it provides the framework for quality assurance both in terms of educational processes and learning content authenticity. On the other hand, quality of the content itself is ensured by the participating content creators who form the communities of practice supporting the OER movement. Quality is also a non-referential and subjective concept. For instance, in Mauritius, content from UK based institutions is highly rated. Quality needs also be ensured at the institutional level where the aggregated content, assembled into larger components i.e. courses are approved through all the academic and administrative channels of the Universities where they are "consumed".

Examples of Courseware Development @ the University of Mauritius Using OERs

Case 1: OER use on an "as-is" basis

Open educational resources can be of different granularity. Some can be full learning units, partial units or simply a few pages that constitute learning resources on a particular topic. Granularity and Repurposing (recontextualisation) are often linked together. There can be situations where the higher the granularity, the less repurposing is needed and vice-versa. However this is not always the case as materials with a high degree of granularity are often tightly coupled with specific educational contexts. The Openlearn platform (http://openlearn.open.ac.uk) provides the user with a variety of appropriate information about the granularity, level of contextualisation and the academic level of the said OER in a very clear way.

Figure 1. Importing courses from one learning platform to the other (inter-organisational sharing)

Figure 1 shows the example of one course that has been imported from the Openlearn Platform of the Open University of the UK and restored "as-is" on the University of Mauritius e-learning platform. Examples of such courses are Project Management, Basic Information Technology and General Sciences. Interoperability of the learning platforms and learning content is important to achieve the sharing of courses among organizations.

Case 2: OER use with "repurposing"

The concept of courseware repurposing is quite broad and can, depending of context of use, take different form and meaning. Repurposing is often associated with the term "adapt" and "(re)-contextualisation". The task of repurposing is more complex when the original OER has to undergo the process of "de-contextualisation" before being "re-contextualized". Therefore the repurposing process can be seen as follows:

Repurposing == decontextualisation (optional)à recompose à recontextualisation

One example of courseware repurposing at the University of Mauritius using OERs can be seen through module "LLC1000: Communication and Presentation Skills" as shown in figure 2. This is a first level module delivered to students enrolled on the Diploma in Web and Multimedia Development at the University of Mauritius. The module is a 45-hr course and the outline has been developed beforehand when the programme was submitted for approval to the academic instances of the University. The lifecycle developed in the context of the SideCAP project was applied and the available resources matching the module outline and syllabus were identified and restored as different units within the module space of the e-learning platform.

Figure 2. Shows how courses from OpenLearn Platform are imported in the local platform

The courses were repurposed in the following ways:

- Learning Unit Sequencing was carried out to identify the order in which the different units were to be presented to the learners.
- Learning Activity Scripting to add different contextualized learning activities and scenarios to engage learners in order to achieve the targeted skills and competencies.
- Learner Support Infrastructure was provided through the creation of forums, availability of blogs and other communication tools to the learners.

Case 3: OER use with "value-addition"

This example illustrates one method of adding value to the open educational resources that are being used at the University of Mauritius. Figure 3 illustrates how a course on "System Modelling" originally available on the Openlearn platform has been developed on a multiple modality format – namely a browsable HTML version with self-explanatory notes and learning activities, and on an interactive video lecture format available to learners (figure 3) who can customize the learning process as per their individual preferences. The "value addition" process as in this example is a time-consuming process as it involves some prior reworking of the original content. For instance for the interactive video lecture version, lecture slides in terms of PowerPoint Presentations need to be devised and the corresponding text (that will be converted to speech) for each slide has to be worked out.

Once this process is done, an educational technologist needs to work on the storyboarding and prototyping of the interactive video lectures. After this, a set of 'validation-update' cycles are carried out until the final version is agreed upon. For instance, issues like usability and navigational cues of the learning environment have to be dealt with. In addition to this, a graphic designer works out the visual communication aspects in parallel while a developer implements the prototype into the final product.

Figure 3. Value Addition in terms of pedagogical design to imported OERs

While OERs are freely available, the "value addition" process can be quite costly depending on the type of activity being carried out. As can be seen from this example, providing a multiple modality format has some implications on the human resource needs which inevitably have a cost.

OERs @ the University of Mauritius: An Innovative Model to achieve Sustainable e-Learning

Origin of the Activity: The SIDECAP Project

This is a trans-national educational and research project funded by the ACP-EU Cooperation Programme in Higher Education (EDULINK). The Project is scheduled to last 32 months and is led by the Institute of Educational Technology at the UK Open University (OU) with partners from Lews Castle College, University of the Highlands and Islands Millennium Institute, Scotland (UHI), University of Mauritius (UoM) Africa, University of the South Pacific (USP) Pacific and University of the West Indies (UWI) Caribbean. The proposal has been built upon the strengths, constraints, and opportunities that were identified during a previous Asia-Link project, and has been matched with the institutional expertise of the chosen European partners.

The overall objective of the action is to promote multilateral activity amongst the European and ACP partners through practical activities, networking and hands-on exercises designed to improve the quality of teaching and support for students. A range of multilateral activities are proposed which give each partner an opportunity for leadership and teaching in their area of expertise as well as opportunities to learn from the other partners. The intention is to build a working network of ACPdistance teaching universities based on mutual understanding and exchange, and to support this through the coordinated efforts of the European universities. The activities of the proposal will be practical, hands-on and experiential in order that all participants really engage with the training.

A 3-Step Elaboration of the Model and the outcome

<u>The problem</u>

The University of Mauritius is a publicly funded non-profit institution delivering tertiary education for free (at undergraduate level). The only programmes charging fees are postgraduate and part-time programmes. The University consists of five faculties namely Science, Engineering, Law and Management, Humanities, Agriculture and the Lifelong Learning Cluster. The Lifelong Learning Cluster was set up in 2004 regrouping three centres namely, the Virtual Centre for Innovative Learning Technologies, the Centre for Professional Development and Lifelong Learning and The Centre for Information Technology and Systems. The University is fully committed towards using open and online learning to increase access to education for citizens of all Mauritius especially to those from economically deprived areas. The University of Mauritius, through its Virtual Centre for Innovative Learning Technologies launched its virtual campus in 2002 with the main objective of increasing access to education in the country and to promote innovative

teaching and learning on the university campus. However, with limited funds and resources, the University has to rely on continuous innovative and sustainable approaches to support the existence of the Virtual Campus. One such strategy was to lay emphasis on Open Source Tools and Techniques.

However, the cost of developing content still had a major financial implication. The University of Mauritius through its Virtual Centre for Innovative Learning committed to the movement through a series of activities such as the organisation of the International Conference on Open and Online Learning in 2005 with Open Educational Resources (OERs) as a major theme, actively participated with the Commonwealth of learning VUSSC project in the promotion of OERs and more recently partnered with a consortium of universities led by the Open University UK, in a EU-ACP funded project.

The model

The model is a simple iterative system that aims to achieve economic and quality enhancement of educational activities in a sustained manner. Funding received from the research project is used to employ one person on a part-time temporary basis. The assignment is mainly to assist academics in the search for OERs that can be used (repurposed) to mount short courses and programme of studies.

This brings down the cost of development of courseware and therefore provides a way for the institution to reduce in some areas its chargeable fees per student. It is foreseen that enrolment will increase as some programmes would be affordable to a greater portion of the student community.

The outcome

A first application of the model started with the OER being used extensively in the development of three programmes of studies namely a Masters in Educational Technology, a Bachelor degree in Educational and Instructional Technology and a Diploma in Web and Multimedia Development. The Bachelor's programme is a top-up programme which is targeted at educators having already a Diploma in Education or equivalent. It is a paid course offered on a part-time basis completely online.

The cost of development of one online course of 45 hours duration amounts to USD $ 2000 and by incorporating OERs in the courses the total development costs dropped to about 40% as some courses were fully mounted from open resources. Based on the facts that the students would not be using physical university resources, the fees for the programmes also decreased. As such, an increase in intake for the Masters course was noted as fifteen students enrolled on the course. On the Bachelor programme, forty-five students enrolled and another 45 enrolled on the Diploma Programme. The Diploma programme is not a paid course (tuition fees) as undergraduate education is free at the University of Mauritius. The use of OERs helped reduce the courseware development costs and funds generated through the other paid courses made it possible to run the undergraduate diploma thereby allowing additional students to secure a place at the University on the Web and Multimedia Development Diploma.

On the other hand, to ensure continuous intake for subsequent years, a short online professional course in teacher training was mounted using OER material from the OpenLearn environment of the Open University of the UK. The course was offered free of charge to educators except for a low administrative fee that was charged. An unexpected high number of about three hundred educators enrolled on the professional course. The strategic aim in this short course is to build a network of educators who would see the benefits of enrolling on further studies on a more formal basis such as the Bachelor programme, and ultimately on the Masters programme.

Preliminary Observations

At this stage, where the work done was mainly on an experimental basis, we start to look for some preliminary answers to a few research questions that would be important to determine the deployment of such methods and techniques on wider scales in the University's educational system.

1. How do the lecturers who were exposed to this approach in the workshops that were organised perceive this new way to develop courses?

Throughout the duration of the SIDECAP project, two main workshops were organised to promote this novel concept to academics and educators. There were also two research seminar presentations made to academics which were aimed to stimulate brainstorming and discussion related to the OER model and approaches. At this stage the OER activity can be separated in terms of belief and practices.

On one hand, there are the four VCILT academics who were involved in the project and in previous initiatives on OER with the Commonwealth of Learning. On the other hand, there are the academics (about a dozen) who are regularly involved with the Centre in the online development and delivery of their own courses. Finally there are the majority of the academics who are happy and satisfied within their current traditional context of education.

The first element of observation was that response to the workshops and presentations on the topic were very low among the vast majority of academics. Only the academics from the VCILT and a few others who are regularly involved in the centre are present. There are also a few from other public tertiary institutions like the Mauritius Institute of Education, and the Mauritius College of the Air. There are a number of classic reasons for this kind of lack of interest being shown by academics in such initiatives. From experience and feedback received, the main ones are listed below:

- Academics are mainly interested in researching their area of expertise rather than improving their teaching approaches.
- They have an already overloaded work schedule and they do not have time for such 'extra' activities.
- There is no kind of extra reward or tangible gains in being involved in such initiatives as their promotion criteria are well defined.
- They prefer their old traditional way of teaching as they already master that approach. Why would they make extra effort and spend a lot of time learning the basics of things that others (VCILT academics) master.
- It takes more time to understand other's contents/lectures than to create one's own content/lectures.
- Those who were present in the workshops were keen to explore further the approach but had a number of questions and confusions in their minds. This indeed stimulated fruitful discussions and exchange of ideas. The main issues that were raised and to which participants could not get clear answers were:
- Are academics allowed to disseminate content produced during their course employment freely on the web without the permission of their employers? This question generated a number of diverging views as some academics were of the view that this material was their intellectual property and that they had all the rights on it, while others pointed out that under employment and copyright laws, the employer retains copyright of the materials unless the employment contracts state otherwise.
- How do we ensure quality of the content that is being downloaded for re-use? The web is an uncontrolled repository of materials from known, unknown and non-authenticated identities and there is hardly any fool-proof way to get contents with proven authenticity and integrity.
- What are the additional skills and formal training that will be needed for academics of different fields who have limited knowledge of information technology, and instructional design? What will be a reasonable time frame for them to arrive at a satisfactory level of operation? What type of support will be available to them? What will be the incentives from the institution for them to get involved in such activities?

2. How do students react to the material developed in this project that was presented to them during the course of their studies?

As mentioned earlier, OERs that were reused in the context of this project were implemented as (1) stand-alone modules aimed at professional development and (2) as components of existing courses in programmes of studies at Diploma, Bachelor and Masters Level. When students have to evaluate courses or materials, they often do so without a knowledge or clue of the origin of the material. If they knew the source of the materials beforehand, this can also lead to a biased evaluation from their side. To cater for this element of bias, two approaches to evaluation were adopted. For the stand-alone modules aimed at continuous improvement of educators, the participants were made aware that the materials come from the Open University of the United Kingdom while for the courses embedded in the mainstream programmes, learners were not made aware of this detail. They were asked to evaluate the '*pertinence of content proposed to them by their lecturers*' and to comment on the way '*the materials have been designed*' in terms of their own perceptions and expectations.

When it comes to pertinence of content, it is observed that very often students do not read about the course details and expected outcomes thoroughly or they simply do not understand what the course is about. For instance, in one course titled 'Educational Technologies' which provides learners to an introductory overview of what educational technology is all about, some learners commented that they thought they would learn how to assemble a computer in the course!

Learners who participated on the professional development courses found the content to be pertinent to their interest and of high quality. When probed further about how they rate the quality of the content, most of them answered that they learnt new things and that they know that the Open University of the UK is a highly reputed institution. However, some educators who were enrolled on the professional development of teachers programme pointed out examples and areas where the content would not be too relevant in their local context and work environment.

In terms of how they found the design of the materials, both groups of students highlighted that the text was mainly written in good quality simple English which was easy to understand. Most of them however found the interactive video lectures (proposed to them as value addition to the original content) to be more 'appealing' to their learning preferences as they felt that the lecturer was interacting and explaining to them and they felt this can help to overcome the feeling of being isolated when they have to read text and comprehend on their own. Many students also commented being bored sometimes with hearing the synthesized voices although they recognize that it was clear and understandable. In that scenario, they would have a preference for a human recorded voice.

Institutional Implications for University of Mauritius

Cultural Dimensions

Culture has always played a significant role in shaping educational policies and guiding learning and teaching practices in our schools. It is therefore important that at the institutional level, policy makers are satisfied of the cultural appropriateness of the materials being used in the educational system. The cultural

aspect is also subjective in many ways and culture encompasses a set of practices from beliefs to actual practices. This suggests that creators of OERs can pay attention in their design to cater for a global culture rather than their local cultural dimensions. However to date, there is no single standardized process or instructional design methodology that can be followed to achieve such uniformity in the output of the content creation process. Metadata information is one possibility but this will definitely add burden to the already cumbersome process of filling metadata information. It also appears very difficult to tag the cultural aspect element with one single keyword. The onus is therefore on the instructional design team to judge such elements and to make the appropriate pedagogical decision.

Content Reuse versus Pedagogical Re-Engineering

Content Reuse is very often a term that is use so superficially that it makes the whole process of using content developed somewhere else by someone else for some other context seem easy to happen. Experience and research has however proven the contrary as sometimes reuse of certain type of material make the pedagogical design (or redesign) so complex that it would be simpler to write content again from scratch. There is a tendency to confuse with straightforward reuse and pedagogical re-engineering of content that is needed in many cases. Pedagogical re-engineering can be quite costly in terms of human resource requirements, time input and on financial aspects. Therefore it is important **not** to assume that the uses of open educational resources will *de-facto* lead to a decrease in courseware development costs. Planning and feasibility studies on a projectized basis are therefore important for such initiatives to be successful.

Quality Assurance

The main barrier to such an innovative way to reconceptualise the educational process in traditional universities are the quality assurance procedures that need to be 'strictly' followed. The issue of quality in OER-based courseware development process relates only to the content development phase on which the author of a repurposed course has no particular control. This is where most of the concerns related to quality assurance lies. Therefore academics and instructors using OERs need to have a well-established set of guidelines that would provide a framework for the search and use of freely available content from the Web. De-facto trusted sites like the OpenLearn platform, Connexions and Curriki, just to name a few would greatly help but it is in fact very difficult for an institution to control such activities of their staff. One possibility would be for OERs to form an integral part of the institution's courseware development policies rather than being used on piece-meal basis by individual academics.

OER Adoption Policies

Involvement (from creation to reuse, dissemination and sharing) in the OER movement needs *apriori* be at the institutional level. While it is acceptable that research and experimentation takes place at researcher levels, there need to be explicit policies on the way that the University is involved in the OER movement. This will enable empowerment of communities of practice in OERs given that it will be on institutional basis on a first instance, and then involvement of academics in a second instance. While in theory they should be working together at most levels, in practice it is not. We mainly find that OERs are mainly seen as a potential research area to explore by a few academics in isolation. Having appropriate policies at institutional levels will not only promote the OER movement but also hopefully bring potential solutions to issues such as quality, IPR and culture.

Conclusion

The case study presented here describes how OERs can help build sustainable educational models especially for Universities in the developing countries where there are a number of constraints within the systems. The model presented in the paper has been initially experimented and has yielded satisfactory results. Any model is however, subject to change, extended experimentation and continuous refinement to meet the emerging exigencies and challenges of modern global education.

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Special Notes

1. The work described in the paper and the model was submitted for appraisal in the context of the World Innovation Summit for Education Award 2009 by the Qatar Foundation in the category "Sustainability" and the submission was retained by the pre-jury to be among the finalists of the award competition.
2. The work (in terms of the materials developed) in its integrated form within a curriculum namely in the University of Mauritius Diploma programme in Web and Multimedia Development was selected to receive the Commonwealth of Learning Excellence Award 2010 in Distance Learning Materials.

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