Proceedings of the Regional Symposium on Open Educational Resources: An Asian Perspective on Policy and Practices

19th - 21st September 2012

This Symposium is dedicated to the International Development and Research Centre (IDRC).

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THE OPEN EDUCATION MOVEMENT IN AUSTRALIA: THE NEED FOR POLITICAL LEADERSHIP

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Abstract

This paper starts by exploring some of the most important OER initiatives in Australia, and then describes a centrally funded research project that investigates the state of play of OER in Australia. After that, the authors report on some of the preliminary findings of this research in progress, which surveyed the higher education sector and interviewed key stakeholders. The research findings revealed that there should be greater strategic leadership from government bodies and institutions to regulate the adoption of OER in Australia. According to participants, there is an urgent need for public policies to promote access and availability of OER in the higher education sector, and that these policies could encourage the growth, development and institutional adoption of open educational resources and practices across the sector in Australia.

Keywords: OER in Australia, OER policies, OER project, policy research

Introduction

As more and more countries and governments join the open education movement, the Australian government has to date shown limited interest in embracing the key tenets and aspirations of the movement. One reason for this reluctance to embrace free and open access to education may be linked to the provision of international education in Australia. The industry generates billions of dollars in annual export income. It is this economic reality that may represent one of the powerful barriers to concepts surrounding “free”; whether access, sharing or repurposing. Despite such barriers, there have been some initiatives and policy developments at the governmental level in Australia.

This paper starts by exploring some of the most important OER initiatives in Australia, and then describes a centrally funded research project that investigates the state of play of OER in Australia. After that, the authors report on some of the preliminary findings of this research in progress, which surveyed the higher education sector and interviewed key stakeholders. The research findings revealed that there should be greater strategic leadership from government bodies and institutions to regulate the adoption of OER in Australia. According to participants, there is an urgent need for public policies to promote access and availability of OER in the higher education sector, and that these policies could encourage the growth,
development and institutional adoption of open educational resources and practices across the sector in Australia.

OER Movement in Australia

OER represent an emergent movement that is re-shaping learning and teaching in higher education worldwide. Identified by the last Horizon Report as one technology to be closely consider by higher education institutions, OER are likely to influence the way institutions worldwide deliver education in one year or less (Johnson, Levine, Smith, & Stone, 2010). According to that report, the growth of the open educational trend “is a response to the rising costs of education, the desire for accessing learning in areas where such access is difficult, and an expression of student choice about when and how to learn” (Johnson, et al., 2010, p. 6). In addition, it also argued that OER has the potential to meet the growing demand for higher education worldwide, and to close the gap between formal, non-formal and informal education (Kanwar, Kodhandaraman, & Umar, 2010; Pereira, 2007). In fact, research conducted by UNESCO has identified that the higher education sector is the lead stakeholder for the dissemination and development of OER (D'Antoni, 2008). However, not every country has taken advantage of the full potential of OER. Australia, for instance, has a limited number of OER initiatives and programs at higher education levels compared with the US, UK and some other European countries. One possible reason could be the lack of a national framework and research to support educational institutions (Fitzgerald 2009). Another reason could be the lack of institutional guidelines and support, as well limited understanding of the issues surrounding OER, including copyright and intellectual property issues (Bossu, Brown, & Bull, 2011).

Some of the most popular OER initiatives at institutional level are:

- Macquarie University with its Macquarie E-Learning Centre of Excellence (MELCOE), which specialises in developing open source software tools and open standards for e-learning (OECD, 2007);
- The University of Southern Queensland (USQ), which remains the only Australian member of the OpenCourseWare Consortium (OCWC) (Bull, Bossu, & Brown, 2011);
- USQ, and more recently the University of Wollongong, are the only two Australian universities members of the OER university initiative (Thompson, 2011);
- The College of Fine Arts (COFA), with the University of New South Wales (UNSW), developed quality video and text resources to assist educators to teach online (COFA, 2011); and
- The University of Canberra RecentChangesCamp2012; an annual meeting of interested Open Space. This free gathering has been taken place for the third time in Australia and it is focused on wikis and online collaborative practices. “The aims of these events are to draw together people interested in worldwide iterative knowledge involvement or wikis, to discuss and share knowledge, and eat and socialise in a friendly face to face setting” (RCC2012, 2012, para. 1).

Also, some Australian universities have released some of their teaching materials through iTunesU. Others have created repositories of learning objects. Unfortunately, some of these repositories can only be accessed by the universities’ staff and students. Even though some these repositories support the Creative
Commons license, very few allow for redesigning and repurposing of the content, which therefore limits the value of these resources. In additional, OER have also been adopted by the Vocational Education and Training (VET) and Technical and Further Education (TAFE) sectors in Australia.

In addition to the institutional initiatives mentioned above, there have been some programs and policy developments at the governmental level in Australia. Some of them are:

- The Australian Government’s Open Access and Licensing Framework (AusGOAL), which provides a set of guidelines “to government and related sectors to facilitate open access to publicly funded information” (AusGOAL, 2011, para. 1);
- The Australian National Data Service (ANDS), which is a database containing research resources from research institutions in Australia (ANDS, 2011);
- The Guide to Open Source Software for Australian Government Agencies, which is a policy that requires that government agencies first consider open source software options when requesting tenders (Gray, 2011); and
- Government 2.0, which is an Australian government initiative focused on the “use of technology to encourage a more open and transparent form of government, where the public has a greater role in forming policy and has improved access to government information” (Australian Government, 2012, para. 1).

Even though the above Australian government developments are on par with a number of developments in the UK, the US and also in some European countries (Helsper, 2011), they are mostly concentrated on government bodies. The opposite can be said in relation to policies and developments with an educational focus, as Australia seems to be behind the mentioned countries (Bossu, et al., 2011). If the Australian government wishes to take advantage of the benefits of open educational resources and practices, it will need to adopt strategies that take this movement out of the shadows and place it in a more prominent position within the educational mainstream. Such strategies could assist the government to effectively achieve some of its current agenda, such as to increase participation and access to education to a more diverse student cohort, particularly working adults and those residing in rural and remote locations of Australia (Bradley, Noonan, Nugent, & Scales, 2008). The lack of government leadership on the adoption of OER has encouraged a group of academics and researchers to develop a project proposal to the Australian Learning and Teaching Council (ALTC), a national funding body. The proposal was successfully funded and is presently in its second year. The remainder of this paper will describe this research project titled “Adoption, use and management of Open Educational Resources to enhance teaching and learning in Australia” and present some of preliminary findings.

The Research Project

The overarching purpose of this project is to develop a “Feasibility Protocol” to enable and facilitate the adoption, use and management of Open Educational Resources (OER) for learning and teaching within higher education (HE) institutions in Australia. The Feasibility Protocol will prompt questions and raise issues that need to be considered by institutions wishing to enter the OER movement. With narratives and discussions from the data analysis, examples of practices and literature review,
this protocol aims to assist senior executive managers and others to make informed decisions within their institutions regarding how to approach the adoption of OER.

The Feasibility Protocol (see Figure 1) will contain a set of guiding principles with information on:

- Policy recommendations for higher education institutions in Australia regarding adoption, use and management of OER, including copyright, intellectual property, licensing and other legal issues (policy analysis);
- The opportunities involved with the adopting of OER and OEP;
- The challenges related to the use and adoption of OER and OEP; and
- Strategic directions for institutions interested in adopting OER.

![Figure 1: The structure of the Feasibility Protocol](image)

This is the second year of a two-year research project. The first year involved a comprehensive analysis of the relevant literature surrounding OER internationally and nationally, the collection of institutional and national educational policies and frameworks that enable OER practices and development. Also, an online survey and subsequent interviews were conducted targeting a whole range of higher education stakeholders across Australia. We are currently conducting a preliminary analysis of the data, which will provide the basis of a one-day Symposium, with higher education stakeholders to be invited to attend and provide further feedback on the Feasibility Protocol. The Symposium is also a key dissemination point for this project (Brown & Bossu, 2011; Bull, et al., 2011). Additional feedback gathered during the Symposium will be included in the final analysis, and a comprehensive research report will be then produced and distributed throughout the sector and to interested bodies.
Some Preliminary Findings

The online survey was the major instrument of data collection. There were 101 valid survey responses and 24 participants offered to be interviewed. These numbers are considered acceptable by the research team, as the Australian higher education sector is relatively small, and the sample compares favourably with similar European research surveys. The survey sample included participants from 32 universities in Australia, out of the existing 39, while four other tertiary institutions also responded to the survey. As for the interviews, 24 interviews were conducted with participants from 18 institutions. There was also a balanced gender distribution amongst the respondents: 48 percent male and 51 percent female. The samples also have a good representation of university stakeholder groups (Bossu, et al., 2011).

The majority of respondents have been aware of the OER movement from two to five years and rated their knowledge of OER as intermediate. As for those who have adopted OER, learning objects have been the most preferred type of resources applied in teaching and learning. In a similar fashion, most participants declared that they are not involved in collaborative OER initiatives either in Australia or internationally. However, they indicated that they would like to be involved in OER activities in the future if the opportunity arises. The lack of adoption and participants’ involvement in such activities could be due to the fact that OER practices and initiatives are not included in the current strategic plans of most participating institutions, as declared by the participants. One possible reason for this could be that there have been some small and isolated initiatives occurring within individual institutions (Bossu, et al., 2011). Another possibility could be that the lack of government incentives for the adoption of OER might be already impacting the growth of the movement in Australia by stopping institutions and their academic staff from participating in open educational practices. In fact, the above situation was revealed in the data, as participants believed that government policies are necessary to regulate the adoption of OER in Australia. They also believed that dedicated OER public policies could encourage the growth, development and institutional adoption of open educational resources and practices across the sector in Australia. Even though the efforts of some individual OER initiatives have succeeded at the institutional level in Australia, the movement has expanded faster and more effectively in countries where support was provided at the national level. Particularly in Australia, this support could come in the form of more flexible policies. According to participants, the Australian government should also support higher educational institutions through grants or financial awards to encourage the development of OER, together with a culture of open practices.

As for institutional policies, they were considered an important factor to promote the effective use and adoption of OER. According to the participants, educational institutional should develop policies and activities to promote OER awareness and to clarify issues related to intellectual property and quality assurance. Institutions should also promote and recognise OER initiatives, and this could also occur through financial initiatives. This was also true in studies undertaken in Europe and other parts of the world (OECD, 2007; OPAL, 2011). In fact, many have alerted institutional policy-makers of the existing institutional strategies to the adoption of OER, and that these strategies could be implemented through appropriate internal
regulations and guidelines (Atkins, Brown, & Hammond, 2007; Downes, 2007; Kanwar, et al., 2010).

Conclusion

This paper discussed some recent OER developments within higher education institutions in Australia, as well as some attempts to make available publicly funded research, resources and government information through federal open access policies. Unfortunately, the adoption of OER within mainstream education in Australia appears to be limited due to the lack of educationally focused policies and initiatives, as demonstrated by the research described here. It appears that the Australian government is aware of the open education movement, but has been slow to recognise the global altruistic benefits of the OER movement. According to participants in this research, the movement must be more fully supported by government policies, which support and encourage institutions to share their resources for the public good. Delay in the introduction of open educational resources, as mainstream policy in the provision of education in Australia, could hamper the drive to widen participation in higher education and slow educational collaboration and innovation.

Acknowledgements

This publication is funded by the Office of Learning and Teaching and the Australian Government Department of Industry, Innovation, Science, Research and Tertiary Education through the DEHub Project.

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Abstract

There are many technical decisions to be made in starting an open educational resources (OER) project, and a decision on what platform to use is one of the most preliminary and important considerations. OER projects have evolved rapidly in the past decade, and decisions about platforms reflect such developments. This paper reviews the platform choices made among OpenCourseWare Consortium members. The first generation of OCW required a simple content management system (CMS) or a learning management system (LMS) that could house all the content. As OCW moved on to encompass various functions aimed at richer user experiences, platforms evolved accordingly. This paper examines the progression of platforms for OCW projects and recommends methods for deciding on considerations for choosing a platform.

Keywords
OER, OCW, open educational resources, opencourseware, platform, CMS, LMS

Introduction

MIT’s OpenCourseWare (OCW) project started in 2001, and it elicited considerable interest from academics around the world. With the goal of posting course materials from all courses offered at MIT, the project offered the world syllabuses, course calendars, lecture notes, audio and video files, and exam questions via internet. All the materials were hosted on a content management system developed in-house. In order to encourage more institutions to start OCW and to set a standard in producing and sharing content, the Hewlett Foundation commissioned a project to build a content management system specifically for OCW. eduCommons developed through this process and was strategically promoted within the OCW community.

UNIVERSIA, a consortium of institutions from Spanish and Portuguese speaking countries, was one of the early OCW adopters. Deciding to use eduCommons for all its member projects, Universia then translated and customized the platform. eduCommons also became the choice for many institutions starting OCW around the world, from Japan to Russia. Around 2006, OCW platform requirements involved presenting a good ‘snapshot’ of a course, offering RSS and metadata function for discoverability, and standardization of OCW for future remix.

Open University UK took on another approach for their OER project around the same time—OpenLearn. They invested in customizing Moodle, the most widely used open source learning management system (LMS) in the world. OU’s decision to use Moodle was based on the desire to build learning activities around its open content. Moodle would allow users of OpenLearn to sign up, form study groups and have discussions around the OERs offered on the website.

As many more institutions joined in the OER movement, the need for additional CMS functions began to surface. There was a need for more suitable for video hosting. There was a need for greater incorporation of community building. Institutions were now faced with having to choose a platform that best suited their
needs for functionality and scale.

1 Overview of Platforms

1.1 Factors to be considered

In 2011, members of the OpenCourseWare Consortium held a discussion on platforms. Developers from eduCommons, OpenUCT, OERbit, Connexions, NIXTY, and OpenLearn participated in the creation of a comparison chart for the different platforms and their functions. In the decade that has passed since the advent of the MIT OCW, more platform options have emerged than ever. However, implementation and choice among those platforms has become more difficult for an individual project. A platform has to provide a good user experience for both faculty content providers and for the users of that content. Not surprisingly, the discussants demonstrated different sets of priorities. For example, Glen Moriarty from NIXTY put upmost emphasis on course tools and learning outcomes. NIXTY is a platform allowing individuals to upload content and learners to create portfolios for keeping track of their learning activities. By contrast, Jenny Gray from OU UK put priority on publishing procedures such as flexible course organization and integration with an institution’s authentication systems.

Before comparing and evaluating different platforms, therefore, the group devised a list of functions and other factors for comparison. Five categories emerged: infrastructure, content management, user management, learner tools, and assessment tools.

For infrastructure, factors of consideration were as follows:

-Programming Language/Platform
-Database
-OS Support
-Support level (hosting etc)
-Extensibility
-Programmer documentation
-Multilingual interface
-Current Languages Supported
-Support for Internationalization
-Customizable look and feel

-Internal backup and restore
-Standards supported
-Reporting
-Access to content without sign-on
-Search engine optimization
-Integration with institution authentication systems
-Hosted/ self hosted
-Uptime
-Security level
-Self-registration
-Accessibility User Interface
-Accessibility Support and Tracking for Content Creation
-Static Site
-Performance Metrics.

The list above mainly shows technical considerations. Preference may also depend on a project’s experience of the technical support available for a given platform, and it is wise for an institution to consider how each platform fits its own capacity for technical support.

For content management, the following were selected as factors to be considered:

-Workflow (roles)
-Customizable Workflow
-IP Management support
-WYWIWYG editor
-Licensing choice support
-Level of ease for reuse
-Export support in range of standard compliant packages
-Import support in range of standard compliant packages
-Flexible course structures
-Multilingual content
-Support for courses that are paid-for
-Open and closed areas
-Offline-authoring
-Accessibility tracking
-Control of licensing at the asset level
-Marking up content as different sorts of assets (reading, video etc)
-Creation of web links
-Allowance for upload
-Custom home page/help/contact
-Editing/Changing/Refreshing OER
-Disclaimer on Submission.
For user management, the following factors had to be considered:

- User profiles
- Groups
- Customizable taxonomies

For learner tools, the following were pointed out as consideration factors:

- Integrated discussion forums
- Tagging/keywords
- Search
- Other interactive activities
- Personalized space
- Ratings and reviews of courses
- Learning pathways or other recommendation service
- E-portfolio
- Contextual help
- Other collaborative activities
- Peer support
- Knowledge mapping
- Learning Journals or blogs
- Activity records
- Metadata export (OAI, RSS, RDF)
- Social bookmarking
- Widgets Inbound and Outbound

And lastly, for assessment tools, the following were mentioned:

- Assessment engine
- Grading
- Certification
- Self-assessment exercises


Platform needs development progressed with the development of OCW. The first generation of OCW was about uni-directional content provision. Platform needs primarily involved displaying content so that users could find what they needed. eduCommons offered a platform which categorized course materials, generated RSS feeds and managed metadata functions. Most importantly for members of the Consortium, once many members were using the same platform, interoperability of content would be an easy problem to solve. Concern for interoperability motivated many members’ decision to start their OCW projects by customizing eduCommons.

People soon saw, however, that there were too many other factors that should be incorporated in the platform choice. The second generation of OCW projects were about collaboration and community. Many of the early-adopter institutions started by doing the processing content for their faculty. However, scaling up these projects had proven too costly. It was important that the faculty process their own material, and hence, platforms needed to incorporate a smarter work process, rights management and IP clearance, and an easier workflow that worked with faculty teaching styles. Meanwhile, multimedia and video were becoming increasingly important for OCW, presenting their own platform issues. This is when many Consortium members began to build their own platforms and to experiment with other CMS's.

In order to make OCW an institution-wide initiative, it would make sense to modify an LMS to be used as an OCW platform. Thus, some members experimented with Moodle, Sharepoint and Blackboard to make an 'open' version connected to the institution’s existing LMS.

The University of Michigan was in the forefront of incorporating work processes to the OCW platform. Graduate students volunteered to create OCW materials for their professors, and a system called OERca was developed to allow these volunteers to review IP clearance. Although Michigan’s OCW project was on eduCommons, the project allowed for variations in creating content. Faculty could build collaboration into their classes by using Wikimedia. Then Michigan moved onto building a Drupal based platform called OERbit, addressing many of the
needs arising from years of working on an OCW project.

Drupal also was the choice for the University of Cape Town. After thoroughly reviewing Wordpress, dSpace, Drupal, ePrints, and Plone, UCT decided to modify Drupal for their newly launching project.

More members began to use third-party platform services. The UC Berkeley Webcast project is a video project augmenting their own video platform with third-party services such as Youtube and iTunesU. MIT also began to use Youtube and the Videolectures.net platform for its videos.

An interesting attempt was made by Korea University, displaying all its content in a Second Life exhibition hall. Students could download course content and hold a discussion session on any particular course material by reserving a classroom.

An active search for that 'perfect' platform has been an ongoing process for many members. Now, there is a new generation of projects within the Consortium community for whom content utilization, not content creation is the key issue. This requires totally different approaches and technical requirements for OCW projects.

The NEXUS project from Indonesia is a government-funded project utilizing OER to grant certificates at a very low cost. An LMS provides for assessment. OpenStudy enables discussions around OCW course materials using Twitter. Netease is a video translation project, utilizing a microblogging system to allow for discussions. New types of OCW projects are evolving, and the discussion on OER platforms will take a different form in the very near future.

2. Further Considerations
The most important issue for many members now is fully promoting the potential of OER to create maximum impact. One very important factor not discussed in this paper, for example, is the use of mobile platforms. Many people have been working on this issue, but it still requires quite a costly investment to develop options for multiple mobile phone operating systems. Because mobile platforms may change the way OERs are presented and used, however, the time spent thinking about them is well spent.

There are tens of thousands of course modules out there. How we utilize these valuable materials may dictate what kinds of platforms we need for further development.

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Abstract

Open Educational Resources (OER) are materials used to support education that may be freely accessed, reused, modified and shared by users. OER usually employ a range of media and other resources contained in digital media collections from around the world. OER need to be very carefully structured so that the users can follow a logical learning path and get an engaging, interactive, and enjoyable learning experience. To make this happen, OER developers need technical expertise and sufficient knowledge about pedagogic principles. Present trends reveal that a number of people from different walks of life are designing and developing OER. It is perceived that most of them are developing OER without undergoing any specific pedagogical training, and in the absence of proper knowledge and training about pedagogy, one can not be sure that the produced OER will be of superior quality. Therefore, it seems essential that besides technical expertise, developers must have sufficient knowledge about useful pedagogic principles. There are number of pedagogic principles that can be employed by developers to design and develop engaging and interesting OER. In this backdrop, present paper discusses and details about a number of pedagogical principles for design and development of effective OER.

Keywords- OER, OER designing principles, OER development practices, Pedagogical principles for OER

Introduction

Now-a-days Open Educational Resources (OER). movement is making significant gains in educational processes but much is not known about who is actually producing and using OER, as observed by Hylén (2009. p.131), “Of course, institution-based initiatives, like the OCW programmes at different universities, use their own staff to produce their material; and some of them, such as MIT, try to continuously evaluate who their users are. But, as a whole, very little is known about the users and producers.” The researchers are not in a position to pinpoint the users and producers of OER but they are sure about the purpose of its usage. The purpose of using OER in education is to enhance a kind of learning that enables the development of both individual and social capabilities for understanding and acting (OECD, 2007). To meet these objectives and expectations, we need properly designed, carefully structured and pedagogically sound OER.
Current trends reveal that a number of people from different walks of life are designing and developing OER. It is perceived that most of them are developing OER without undergoing any specific pedagogic training, and in the absence of proper knowledge and training about pedagogy, one can not be sure that the produced OER will be of superior quality. Therefore, it seems essential that besides technical expertise, developers must have sufficient knowledge about useful pedagogic principles. There are number of pedagogic principles that can be employed to design and develop OER. Among these principles, following can be of immense help to developers for designing and developing highly interactive, engaging, and effective OER.

(i) **Visualize about the users**

Before developing the OER material, developers must visualize the potential users in their mind. They are required to understand the users profile and their intention to use the resource. Visualizing about possible users is instrumental to see the issues from the user’s point of view and to put appropriate questions and interactions in the material. This awareness will help the developers to keep the content relevant to the needs of users and to build appropriate package. Most importantly, visualization about users will be helpful for developers to overcome abstraction as OER has limited scope for face to face contact and constructive feedback.

(ii) **Customize the learning needs of users**

The ability of the developers to customize learner needs is very important for developing useful OER. Therefore, developers are required to assume that what the users already knows about the topic and what will be their learning needs. The useful practice for developers in this regard will be to get some experience as a user before producing OER. Past experiences of undergoing e-courses, e- sessions and e- instruction will be handy for developers to develop courseware from a user’s perspective. This practice will help developers a lot to know about users’ likings and disliking. The simple principle in this regard will be that while developing OER material, think as if you are a user and this package is designed to satisfy your individual learning needs.

(iii) **Learn about the learning states**

People learn in different ways. Developers can not exactly predict that how the users are going to learn but they can make ways about their learning states. The learning state or condition of an individual makes it possible for him or her to engage profitably in a given learning activity. The learning
readiness of individual depends on factors as past experiences, cognitive development, affective state, and motivation. It also depends on the instructional methods and materials to be used. The developers must have knowledge and understanding about these characteristics or circumstances before proceeding on a given course of action. To keep pace with the changing expectations of users, OER developers must understand the psychology of learning and update them about evolving researches on human learning and learning states.

(iv) Foresee instructional challenges

It is very important for developers to understand the challenges of OER instructional model. These challenges can be in terms of technology, diverse audience profile (experience and motivation levels), cultural diversity, learning complexity, and so on. The trick is to relate the online model with a classroom situation, and think of parallel methods in the online context for meeting the above stated challenges. Developers must also remember that OER are learner centered in nature and normally works on the principle of direct interaction between users and content. The greater challenge before developers in this context is to hook the user, sustain the user, and satisfy the user. Developers can overcome these instructional challenges by understanding the science of instruction that calls for a thorough understanding of how instruction works, how it is encoded and consequently decoded by the users.

(v) Emulate technology of instruction

Technology of instruction plays a pivotal role for designing of OER. OER needs to be designed for diverse groups of users and their learning needs. The instructional aspects decide that how users will perceive the OER and provide the opportunity for developers to interact with users through learning materials. There are many instructional techniques to make learning experiences memorable, like using interesting contexts, novel situations, real-world or authentic environments, problem-solving scenarios, simulations, engaging themes, engaging media, drill and practice and interface elements. The developers must use these and other appropriate instructional technologies with reference to what is to be taught and how to provide meaningful experiences and the knowledge to the users.

(vi) Choose appropriate instructional design

Often developers feel that adding a number of media like words, pictures, audio, video, graphics, animation, etc to the package would make an interesting instructional design. While a graphic-intensive instructional design might appeal to the novice learners, but for the serious and focused one, this will not work. True, these elements make the package glamorous but on the contrary erode the sheen out of the learning activity. Considering this, developers must understand that excessive use of media elements serve as distracters in the learning process. They must also keep in mind that real essence lies in a balanced use of media elements to enhance learning. The underlying principle is that OER developers must use a design that avoids unnecessary graphic and media elements.
(vii) **Ensure instructional interactivity**

Instructional interactivity is usually defined as interaction that actively stimulates the user’s mind to do those things that improve ability and readiness to perform effectively. The purpose of instructional interactivity is to wrestle intellectual laziness; to reawaken interest in learning; to strengthen ability to learn; and to provide an optimal environment to learn. Good interactivity help users to think, synthesize new information, and integrate their knowledge. Instructional interactivity also contributes to self-confidence and tests learner knowledge whenever they might like a progress check. Therefore, developers are supposed to produce such OER having high level of instructional interactivity. They can do it by adding games, simulations, demonstrations and mini quizzes in the packages.

(viii) **Include interesting exercises**

The foremost challenge before developers is to make packages easy to use, engaging and interactive. One way to make this is to have quizzes and surveys in the lessons. Utilizing little games or activities that user can do will make the resource more interesting. Developers must understand that these exercises will bring meaningful experiences and knowledge in the resources. Employing an exercise or game that requires participants to send individual messages to one another triangulates the learning. Adding games and simulations to resources arouse interest in users that is quite essential for effectiveness of OER. Simulation ensures users to tightly bind to the content and honing learning domain of psychomotor skills. For this purpose, developers can put web addresses of simulation exercise and “hands on” software interaction in the resources.

(ix) **Engage users to practice and learn new things**

Assessing users’ skills and tailoring the resource to accommodate the broad range of skills is must to prepare an effective OER. It demands the designing of resource from the beginning with the target skills in mind because it is difficult to add on or change approaches once the resources is in public domain. Therefore, developers build in ways from beginning to actively engage the users. There is no need to get too caught up with static tasks. There needs to be motion and action to maintain attention. Inclusion of good practices and breaking the material into small learning modules makes it easy to absorb. Developers must understand that encouraging users to find new sources of information is helpful to make them engaged. Mentioning useful website(s) that are relevant to the content will also be a helping tool to make resources more useful.

(x) **Ensure correct and effective delivery of content**

The content and its delivery are crucial to assure the effectiveness of OER. Therefore, developers must know the content and make sure that content is accurate. Taking help of subject matter experts is essential for this purpose. Checking the material, knowing what you are going to tell, how you are going to tell it, and how much time it will take are fundamentals of effective content delivery. Developers are advised to think about users’ need and accordingly
apply the relationship between text, sound, motion and graphics. Developers can put “icebreaker” question or a quiz to break the monotony of content. Developers are also advised to continuously review their work to gain perspective and to check that resource is on the right path.

(xi) Create engaging learning environment

Creation of right environment is instrumental for success of any instructional activity. In case of OER, environment facilitates the locating of information in easiest way. Developers must understand that learner interfaces should be meaningful without having to memorize symbols, terminology and procedures. Developers must also understand that little anxiety and discomfort can actually be helpful for learning but they should come from the user’s desire to do their best and not from fear and frustration with the interface. Developers can fulfill this demand by providing useful and thought provoking learning experiences. The developers must remember that right amount of information, delivered in the right way, for the right reason, and aligned with the right deliverables produces good environment for learning.

(xii) Provide good learning experiences

The vital aspect of OER is to provide good learning experiences. Learning experiences are required to be meaningful and memorable. If a user does not understand the content, then that user will not gain from the experience. If users do not see the meaningful implications of learning prescribed tasks, then applicability of such tasks will be of little help to user experience. Well-designed OER is expected to be meaningful for each user. The developed resources must be sensitive to users demand and appropriate to their needs and levels of readiness. To make this happen, developers must concentrate to select appropriate activities and engage users in experiences that are likely to be meaningful.

(xiii) Follow layman approach of instruction

The developers must apply ‘layman approach’ of instruction. Layman approach works on the principle that you are able to teach a person that does not know anything about the matter. Following this approach, developers can provide more than one way of learning the content for users. Developers must also understand that line after line of text makes learners grow bored and the instructional message gets lost. Therefore, using graphics, non-offensive humor, and interaction (questions, drag-and-drop) will help to keep the developed OER interesting even for those users who are not familiar with the content.

(xiv) Design your package thoroughly

The designing of the OER is most crucial. Instructional design for OER is not a re-format of traditional classroom delivery. The developers must recognize the differences and embrace them. Sketching a good design on paper before committing materials to the learning platform / virtual learning environment will be a helpful practice in this regard. This design, if done properly, will certainly allow seeing which tools will be needed to get the best possible solution for
users. The developers are also advised to read course scripts aloud to ensure that they sound conversational. Minimizing the amount of text on course pages and where possible, using graphics to summarize and emphasize key points will provide a good design.

(xv) **Keep the package simple and interesting**

Learning can be enjoyable by keeping it simple. Developers must take small steps and write in a conversational tone to make it fun, and interesting. Conversational tone prevents feeling of isolation. OER is different from traditional learning therefore interactivity is must to make it interesting. Relying too heavily on assigned readings and book-based tutorials will leave learners with bad taste. Developers can give added value to OER with resources such as- interactive media and educational games, relevant essays or articles, and quick-reference guides. Developers must think that animations and heavy images do not make OER of better quality. The useful principle in this regard will be to keep package short, make it easy and deliver very small snippets of information. This will help to build prior learning environment among users.

**Conclusion**

A search of available literature about OER reveals two interesting facts. First, there are number of resources available regarding technical aspects of producing OER, second, there are hardly any resource that talks about pedagogical aspects of OER development. In absence of practical guidelines about use of pedagogical principles, developers often struggle to produce pedagogically sound OER. Considering this dilemma, present paper outlined and discussed a number of useful pedagogical principles applicable for design and development of OER. Researcher hopes that discussed principles will help the developers to design and develop effective OER for schooling and learning purposes.

**References**


FRAMEWORK FOR DEVELOPMENT OF OER-BASED LEARNING MATERIALS

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Abstract

This paper describes the framework for development of OER-based learning materials in creation and assurance of the learning content; exploring OER repositories; assessments review and establishment of collective feedback sessions at Wawasan Open University (WOU). The considerations of the learning design for the computing courses with engagement of learning experiences and feedbacks from different stakeholders are taken into considerations as one of the major components in the OER-based course development phases. The course development stages (Creation Phase, Evaluation Phase and Production Phase) and the production of interim reports associated with each course units are presented in this paper. Virtual workshops initiated through live broadcast in collective feedback sessions comprising the evaluation of assessments by different subject experts and students are presented in this study. The developments of two OER-based courses are presented in this paper namely TCC121/05 Programming Fundamentals with Java and TCC241/05 Database Programming. The walkthrough of available OER resources and repositories which teachers, facilitators and learners can employ into their learning materials mainly Rice Connexions and MIT OCW are highlighted in this approach.

Keywords: Course Development, OER repositories, Quality Assurance

1. Introduction

A growing number of users are creating and sharing their resources posted on websites, YouTube, Wikibooks, Bookboon, open access directories and other Open Educational Resources (OER) repositories. OER repositories consists of teaching, learning and research resources (Atkins, 2007) that resides in the public domain with intellectual property license that permits free-use or repurpose by others to support access to knowledge. The development of digital materials movement has encouraged users to re-use, revise, remix and redistribute resources (Hilton, 2010) through appropriate tools and made available through creative common licensing for example Rice Connexions (CNX), a collection of online digital resources developed and contributed by learners and available under Creative Commons (CC) license that permits commercial use.

The use of OER repositories has driven the development of OER-based courses for ODL learners at Wawasan Open University (WOU). The repositories are introduced to the course team members who comprised of Course Team Coordinator, Academic Members, Course Writers, Instructional Designers, Editor and External Course Assessor for searching, creating and customizing learning contents including content modules, articles, books and journals. The implementation for the OER-based course
development for WOU computing courses are: TCC121/05 Programming Fundamentals with Java and TCC241/05 Database Programming.

2. OER-Based Course Development Cycle

![OER-based Course Development Diagram]

**Course Development Team:**
Course Team Coordinator, Academic Members, Course Writers, Instructional Designer, Graphics Designer, Learning and Library Services Representatives, External Course Assessor

![Figure 1: Development Phases of OER-based Learning Materials](image)

The development of OER-based learning materials as practiced in WOU includes creation phase, evaluation phase and production phase is depicted in Figure 1. The development phase of OER-based learning materials in this approach is initiated with the creation of Course Syllabus, Course Development Timeline and Course Blue Print by Course Team Coordinator and respective Course Writers. The details of interim reports and production documents in the course development cycle are illustrated in Table 1.

Table 1. Production of Interim Reports and Documents for Course Development Cycle

<table>
<thead>
<tr>
<th>OER-based related production documents</th>
<th>Course Development Team (comprises of different stakeholders for specific course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Syllabus, Course Development Timeline</td>
<td>• Course Writers, Course Team Coordinator</td>
</tr>
<tr>
<td>Course Blue Print</td>
<td>• Minutes Meeting (Course Team Coordinator, Course Writers, Academic Members, Instructional Designers)</td>
</tr>
<tr>
<td></td>
<td>• Course Team Report</td>
</tr>
<tr>
<td></td>
<td>• ECA Reports</td>
</tr>
<tr>
<td>Course Guide</td>
<td>• Minutes Meeting (Course Team Coordinator, Course Writers, Academic Members, Instructional Designers)</td>
</tr>
<tr>
<td></td>
<td>• Course Team Report</td>
</tr>
<tr>
<td></td>
<td>• ECA Reports</td>
</tr>
<tr>
<td>Course Units write up</td>
<td>• Minutes Meeting (Course Team Coordinator, Course Writers, Academic Members, Instructional Designers, Graphics Designers, Learning and Library Services Members)</td>
</tr>
<tr>
<td></td>
<td>• Course Team Report</td>
</tr>
<tr>
<td></td>
<td>• ECA Reports</td>
</tr>
</tbody>
</table>
The course units for each course unit are written based on the reuse, adaptation and remixing of OERs under a CC BY-SA 3.0 license. The course team reports are generated during the writing stages and meetings are held for discussion and evaluation concerning important course specific matters. The course development of the course units are then assessed through evaluation of ECA (SOP for Course Development, 2010) producing interim reports (1 report per course unit) before sending in for in-house production phase. The Course Development Report (CDR) is produced at the end of the production phase that includes level of study and the assessment strategy for each course unit.

3. Evaluation and Quality Assurance via Collective Feedback Sessions

The assurance is made aware throughout course development phases associated with the OER-based course materials with inclusion of course writer’s guidelines, academic members inputs, ECA’s role and guidelines, tutors and students’ feedbacks were incorporated into the development and revision approach.

The discussions in the collective feedback sessions held during the course development focused on the ‘how to develop’ and usage of OER particularly in Java and Database programming related areas. Virtual Workshop Sessions engaged using the virtual domain via WizIQ are held with guidance and step-by-step OER creation sessions for the OER content, intellectual property issues, resources that can be reuse, remix and repurpose can be accessed in the following sessions links:

<table>
<thead>
<tr>
<th>Collective Feedback Sessions</th>
<th>Links</th>
<th>Members attended</th>
</tr>
</thead>
</table>
The study of adapting and remixing individual modules into courses (example illustrated using CNX) is presented in Figure 2. The creation of two modules illustrated in Figure 2 covers Module 1: Object and Classes (with image containing Symbols of Flowcharts), Module 2: Intro to Object and Classes (Pseudocode for Java) and Module 3: Java Programming (Control Structures, Arrays). The examples for the modules created consist of self-contained metadata which allows the users to choose varieties of language used and the subject categories. The creation module enable users to import CNXML documents (Words files, OpenOffice files, LaTex, multimedia assets) and select specific elements of the module to edit.

The modules created through the Collective Feedback Sessions are:

<table>
<thead>
<tr>
<th>Module 1: Object and Classes</th>
<th><a href="http://cnx.org/content/m41591/latest/">http://cnx.org/content/m41591/latest/</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 2: Intro to Object and Classes</td>
<td><a href="http://cnx.org/content/m41398/latest/">http://cnx.org/content/m41398/latest/</a></td>
</tr>
<tr>
<td>Module 3: Java Programming (Control Structures, Arrays)</td>
<td><a href="http://cnx.org/content/m41396/latest/">http://cnx.org/content/m41396/latest/</a></td>
</tr>
</tbody>
</table>

The Open Courseware approach adopted by MIT (Massachusetts Institute of Technology) is opening up educational contents to the world in OER movement. MIT OCW has created a sharing educational resource utilizing learning objects such as lecture notes, assignments and solutions, online textbooks, projects and examples, exams and solutions, image galleries, streaming multimedia content and participation of study groups to be accessed worldwide.

<table>
<thead>
<tr>
<th>MIT OCW Learning Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture notes</td>
</tr>
<tr>
<td>Assignments and Solutions</td>
</tr>
</tbody>
</table>

The learning objects published by MIT OCW in different department can be accessed via http://ocw.mit.edu/courses/ with the Creative Common license (BY-NC-SA)
4. Conclusion

In conclusion, this paper presents the development and inclusion of OER resources in WOU learning materials. The course development cycle includes the interaction among students and tutors with feedbacks sessions and learning experiences of courses units’ content. The OER-based course development framework serves as guideline and validation of academic descriptors for course specialists in initiating and supporting the creation of OER-based learning materials with three different stages (creation phase, evaluation phase and production phase). The features of OER repositories: CNX and MIT OCW (as supplement references) can be adapted to aid in course development process.

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THE OPEN UNIVERSITY OF SRI LANKA’S INSTITUTIONAL POLICIES AND STRATEGIES TOWARDS THE USE OF OPEN EDUCATIONAL RESOURCES

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Abstract
This paper examines the policy initiatives taken by the Open University of Sri Lanka during the past three years to popularize the development, re-use and adaptation of Open Educational Resources (OER). The paper has used the published and unpublished records and materials to unearth the status-quo pertaining to the use of OER at the OUSL and notes the underlying reasons for its unenergetic performance. The OER initiatives, accordingly, has made a limited headway only in the re-use and adaptation of OER materials by some faculty members while the transformation of the existing materials into OER format has not made a headway. The paper explains the underlying reasons for this limited success and outlines how and why the OER options have not been optimally utilized at the OUSL.

Key words
OER, OUSL, OER policy, strategy

Introduction
Teaching and learning process in the university system is at a cross road; given the highly competitive economic environment in which knowledge is acknowledged to be the main driver of progress, universities globally must be equipped with new and relevant knowledge that is in demand. The speed of knowledge doubling has increased and much of this new knowledge is freely accessible to teachers and students through international Web portals. Universities can no longer teach ‘what the teachers know’ or use “yesterday’s knowledge”. Therefore it is imperative that suitable institutional policies and strategies are put in place within the university system to encourage the development, usage and adaptation of such knowledge and encourage new discoveries within the university or elsewhere by the other institutes. Sharing what is already produced is mutually beneficial.

This paper uses the UNESCO definition of OER referred as ‘teaching, learning and research materials in any medium that reside in the public domain or have been released under an open license that permit their free use and in some instances repurposing by others’ (UNESCO, 2002). This enables users to reuse, combine and modify any original work while allowing authors to have their work acknowledge (Creative Commons, 2011).

As the only national University in Sri Lanka that is solely dedicated to the Open Distance Learning (ODL) mode of knowledge development and delivery, the Open University of Sri Lanka (OUSL) views these developments in the
knowledge development process quite promising. From its inception in 1980, the OUSL has been mandated to espouse and promote the internationally valued concepts of lifelong learning and university education for all within Sri Lanka. It is because of this laudable expectation that the mission of the OUSL underscores the need to widen access to educational opportunities with a view to enhance social equity while ensuring cost effectiveness and the quality of study programmes. These laudable expectations are enshrined in the excellence, equity and efficiency goals which is part of the vision of the OUSL (Corporate Plan 2011).

Objectives and methodological issues
The Objective of this paper is to delineate how the OUSL responded to the opportunities created by the OER during the past three years and what factors contributed and or constrained the OUSL’s effort to take part in the OER movement. The academic community at the OUSL was noted to be as conservative as academia in the other conventional universities in Sri Lanka, new ideas such as OER being generally resisted. This resistance demanded a carefully crafted policy framework aided by a corporate strategy to promote the concept and practice of OER at the OUSL.

The methodology was based on published and unpublished materials and also materials gathered through discussions and interviews with those involved in the decision making process of the University in addition to practitioners involved with OER initiatives. Published materials included the Corporate Plan, Action Plans, Annual Reports of the University, News Letters, etc., while unpublished materials included the evaluations of the ADB missions, COL-RIM evaluators, minutes of statutory bodies etc., which provided a useful repository of unprocessed information.

The policy framework, implementation and issues
The Corporate Plan of the OUSL (2011-2016) in its mission emphasizes the need ‘to enhance access to high quality, affordable, and relevant education…’. Although this mission statement does not specifically make reference to OER, it is pertinent to note that OER is generally acknowledged to greatly facilitate achieving the twin objectives of quality and affordability. The assurance of quality parameters of OER are related to making informed choices by the academia responsible for the development of new ODL study materials and /or re-use and adaptation of relevant materials currently available in the public domain.

The plan has been explicit in relation to its vision of achieving the status of ‘the premier ODL institution in Asia through excellence, efficiency and equity in lifelong learning’. The Plan has outlined nine interconnected policy goals that are associated with improving and assuring quality of inputs, processes and outcomes. For instance some of the general aspirations pertaining to achieving excellence include, inter-alia,
• Revise all current study programmes by 2016 to enhance relevance and quality,
• Develop new programmes of study in diverse fields to enhance relevance and quality,
• Transform all programmes to blended /online mode by 2016,
• Make competence in English, ICT, social integration and soft skills compulsory in all programmes by 2016 to enhance employability of graduates.

The plan has been more explicit when it stated that the university undertook to ensure that ‘all course materials at the Foundation Level shall be in the form of open educational resources (OER)’. This was a controversial statement given the general mood of resistance among some academics to anything novel.

When both implicit and explicit policy initiatives are taken in tandem the OUSL has created an enabling environment for the progress of OER movement within university. On the whole, academics are compelled to commit themselves to maintain the quality and relevance of its study programmes. This necessitates that they need to regularly revise curricula, teaching benchmarks and study materials. The challenge for the OUSL is that it needs to keep pace with the changing speed of knowledge generation and refinement.

This challenge must be viewed in the light of quality and affordability goals of the corporate plan. It is a daunting task to continuously and consistently improve content as well as presentation quality of ODL materials. This requires a very substantial investment in terms of person hours and funding. The initial cost of production of ODL materials is prohibitively costly. OER becomes very handy in this context. It was heartening to note that the academic community has accepted in principle, that the Open Educational Resources (OER) can be utilized fully or partially on a continuous basis to help implement revision and also to motivate academia to continuously improve its study programmes, and study materials. The OUSL has experienced the efficacy of the strategy of encouraging the academia to make use of OER currently available.

Most of the existing teaching materials being in the form of printed text, conversion to OER format proved to be a difficult task. It involves significant financial investments. This added with the risk of difficulties in quality being maintained, the University decided to concentrate on the pre-university courses at the foundation levels on experimental basis before taking on other courses at both undergraduate and postgraduate levels. Although there is a general agreement that such course of action would have its own benefits on the assurance of quality of its study programmes the academic staff members show an element of passive resistance to this action programme.

Why adaptation is preferred?
There were a number of reasons why adaptation and re-use were preferred by the academic staff involved in the undergraduate and postgraduate programmes. There was a general agreement that materials chosen were of better quality and changes, if any, were necessary to make them merely culture friendly. Second consideration was ‘why re-invent when there is a wheel that is working’. There was also the advantage that some of these materials are already in circulation and was found to be acceptable among the student community. There may be other reasons such as comparative ease of re-use than writing them afresh.

Why development of OER is resisted?
The main reason was noted to be that the development of OER materials in house challenges the comfort zones of academics when they are not fully committed to update and upgrade their texts. In this sense OER is high risk endeavor. The OUSL course materials in their current format are provided to a limited group of registered students. Quality assurance of these materials is expected to be ensured through course-teams, editors, development testing process; corrections or changes, are conveyed to students at the face to face sessions, through email, internet or normal mail, as the numbers are known and limited. Reprints are done by-annually and revisions are conducted once in five years. In this way there is a danger that students are exposed to relatively old knowledge in cases where the teacher-student commitment to knowledge updating is absent. However, in general, ODL materials provided by the OUSL are observed to be superior than what is purveyed by the conventional system where lecture notes are not printed and hence not subject to outside scrutiny.

Nonetheless, when the materials are made available in the OER format, even inadvertent errors or mistakes in relation to content, facts and figures cannot be allowed because no remedial measures can be taken to rectify them once they are released to public domain. Therefore more stringent quality assurance mechanisms are necessary to produce error free, high-quality material. This is why some academics are reluctant to accept the OER challenge.

Action plan
The strategy of the University to start with conversion of its Foundation Level courses into OER format was premeditated. Firstly, the course developers are to be exposed to a kind of hands-on training to the transformation process. Secondly, as this material in general is elementary introducing suitable changes to make presentations more reader friendly is easy. Thirdly, updating and revisions may be less demanding and hence transformation of this material into OER format also is not as difficult as in the case of more advanced study programmes. More than anything else it is easy to convince the new and young staff to change than the old. Thus the OUSL has made the foundation courses to be became the guinea-pigs of the transformation process.

The OUSL action plan to implement the policy framework outlined above is as follows:
a) establishment of OER cells at faculty levels to encourage the transformation of the foundation level courses
Alongside with the QA process these cells work voluntarily to learn and implement OER transformation at faculty levels. This activity although is at its rudimentary levels can be enhanced by providing leadership and guidance.

b) Identifying OER champions at faculty levels
This is an important activity because there is always some resistance to any new initiatives and also when the establishment code which provides administrative guidelines and the UGC circulars are silent on OER type of initiatives on work norms developed for promotional and career development guidelines. Unfortunately, as a national university the OUSL too is under the strict surveillance concerning the UGC guidelines some of which are anti-ODL in spirit. Therefore it is important to have explicit policy initiatives approved by the governing body on both (a) and (b).

c) Introduction of an incentive mechanism to motivate those staff members making extra-effort to carry out OER transformation
Arising from (a) and (b) above, when the career progress of the OUSL staff is governed by the UGC guidelines there is no recognition whatsoever for work carried out by the academia on initiatives such as OER. The UGC is meant for the administration of the conventional university system which is based on the residential or semi-residential mode of university education with a strong face-to-face link. Naturally OER is alien to the UGC.

d) Train academic staff members interested in OER
Fortunately this is matter for the OUSL’s governing council.

e) Encourage research initiatives to examine the processes, problems and prospects of OER
This activity too can be handled by the governing council of OUSL.

The OUSL has already taken several additional initiatives geared towards publishing its materials in OER form. In the first place, a Document Management System (DMS) was developed as part of the Open University Management Information System (OMIS). Action has been taken to upload soft copies of all OUSL course materials to the DMS. Initially, access to this repository will be restricted to the OUSL academic staff. In the second stage, this will be opened to OUSL registered students. In the final stage, the materials will be made available to the outside world free of charge as OER materials.

The OUSL Library has already published the past examination papers of all four faculties in pdf format on the OUSL web, where anyone interested can have access to this facility. Also, the OUSL Library is in the process of developing a repository of research output, where copies of research publications of all its
academics are uploaded and maintained. This will also be made available to all, once the initial developments are completed.

Conclusions
While OUSL has taken some positive initiatives and laid most of the groundwork necessary for the utilization of OER, much more needs to be done to ensure successful and effective deployment. Timely procurement of required services, developing the necessary skilled personnel by ongoing training and timely implementation of necessary infrastructure, procedures etc. are matters that need to be attended to without delay. The future of OUSL is at stake for OER has made higher education borderless and other institutions are posing a threat to its survival by making optimum use of its benefits.

As it stands now OUSL’s own initiatives are below required levels and are yet to bear fruit enabling effective penetration of the market. The speed of growth and momentum are well below the levels necessary to remain competitive in the Higher Education market-place which is changing at a phenomenal pace. The time has come for OUSL to reconsider its level of commitment to OER initiatives. More dynamic actions will have to be taken by OUSL following a well-considered decision to remain fully committed to ODL methodology.

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AN OVERVIEW OF THE STRATEGIC OER POSITIONING OF THE ONLY DEDICATED ODL UNIVERSITY IN SOUTHERN AFRICA

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Abstract The focus of this paper was to establish the current situation at the only dedicated ODL university in Southern Africa, the University of South Africa (UNISA), regarding the use of and contribution to Open Educational Resources (OER). It was the intention of the authors to determine whether the university has any institutional position or intention in this regard and whether the policies of the institution are conducive towards Open Educational Practice. Information was gathered through a review of institutional strategic documents, research papers and reports, communication by the Vice-Chancellor both within the institution and to external stakeholders, as well as specific academic practices in this regard. The results of the review indicate clearly that the university has been positioning itself to take advantage of this movement and institutional policies and resources are being brought in line with this position. This means that academic colleges at the University of South Africa will be required to establish their own positions in this regard, in order to contribute to and benefit from the OER initiative.

Keywords: ODL, OER, UNISA, distance education, open courseware, HEI policy

1. Introduction
Who gives knowledge away for free? A call for universities and academics to move towards the use of and contribution to open educational resources (OER) is often motivated by the fact that education at universities is financed by public funds and therefore should be available to the nation, as well as the argument that knowledge is not owned by any one institution once it has entered the public domain (Atkins, Brown, & Hammond, 2007). Institutions of Higher Education merely offer variants of the same knowledge using their own methodologies and learner support (Butcher, 2012).

The challenge to meet the growing demand for higher education seem insurmountable in developing countries, and especially so in Africa. The mission statement of UNISA encompasses, inter alia, offering education to the African continent where the resources and opportunities for education are scarce. The use of open educational resources will assist UNISA in meeting the need for further and higher education on its own continent and in its own country.

2. Background
The University of South Africa (UNISA) at present, was constituted on 1 January 2004 after a merger of the old University of South Africa, Technikon Southern Africa, and the incorporation of the Distance Education Campus of the Vista University, VUDEC (UNISA, 2009). The merger resulted in UNISA being South Africa’s only dedicated Distance Education University (Makhanya M. S., 2012).
The merger provided the impetus and necessity for UNISA to examine its role in society and to ascertain how the new opportunities, challenges and synergies brought about by the merger could be leveraged. UNISA was also impelled to restructure and harmonize its structures, processes, procedures and the programme qualification mix.

Given UNISA’s comprehensive identity and its perceived role in South African higher education and future increased role in education on the continent, it was necessary that the university construct a new mission, vision, values and strategies for the future. One of the outcomes was the development of a new vision -“(t)owards the African University in the service of humanity”. An aspect of UNISA’s mission statement, is a commitment to “(p)rovide quality general and career-focused learning opportunities, underpinned by principles of lifelong learning, flexibility and student centeredness”(UNISA, 2010).

During 2008 the University Council approved an “Open Distance Learning Policy”(ODL Policy) that placed UNISA in a new dimension with regards to becoming an open institution of higher learning, rather than merely an institution for distance learning. The policy defined the concept of open learning as: “an approach to learning that gives students flexibility and choice over what, when, where, at what pace and how they learn. Open learning is all encompassing and includes distance education, resource-based learning, correspondence learning, flexi-study and self-paced study” (UNISA, 2008). By approving this policy and adopting the definition of ODL, UNISA combined the characteristics of distance education (a method of education provision) and open learning as its modus operandi.

Changes in both the education environment and the possibilities offered by the development of information and communication technology has led UNISA to already redefine itself as an open distance e-learning (ODeL) institution. Thereby transforming from a limited model of open and distance education, and being committed to e-learning.

Early in 2012 UNISA management communicated that the Portfolio for Teaching and Learning must provide, amongst others, quality ODL tuition and support services to students (UNISA, 2012a). Being the only dedicated ODL-university in South Africa, is a strength that motivates a wider and more open tuition model. It is also acknowledged that the expanded reach through ICT for enhanced learner support is an opportunity that the university and education cannot afford to miss (UNISA, 2012a).

3. UNISA and OER
If UNISA is not to miss the opportunity of becoming part of the global education trend of OER and resource based learning then it is important to ascertain the current status regarding OER usage. Contributions can be measured by reflecting on a couple of factors that will give an overview of the current position as well as the direction in which the University is moving. Decisions and changes in a university setting are shaped by policies and champions. Without policies there is no guide for the direction in which the institution is moving (Bateman, 2008). “Policies emphasise educational innovation and organisational change in educational institutions” (OLCOS, 2012).

In light of the fact that this paper strives to give an overview of Unisa and OER, the starting point will be to reflect on UNISA’s current policies. This paper will also consider UNISA’s stance with regard to contributing toward OER’s and the practice thereof and on the other side of the OER coin, the use of OER’s in Unisa. Other than policies and contributions to OER, there are also practices that are indicative of a university following the global trend of Open Educational Resources and courseware, like institutional repositories and portals. This paper will also examine UNISA’s standing in this regard.
3.1 Official UNISA documents that reflect institutional OER position
As part preparation for an as yet unpublished report, a review of Unisa official documentation was undertaken by Archer & Prinsloo (2012). The authors selected 27 Unisa policies, strategies, implementation plans, regulations and other documents (from now on referred to as Unisa documents) for review as they were held by the authors to have potential to influence the Unisa environment in respect of OER (personal communication, 2012).

This review found that:
- An all-encompassing OER strategy is necessary for Unisa, one that could guide future policy development as well as the review of existing documents. However, in light of this not currently being available, it was found that policies often encouraged the espousal of OER.
- Since 2010 four policies (Curriculum policy, Implementing the curriculum policy, ICT-enhanced teaching and learning strategy and Institutional Operational Plan 2012-2013) had been adopted by the university which specifically mention OER. These documents provide inter alia for the use of creative commons license, a Unisa portal, the provision of support for developing OER as well as tools for OER.
- There are shortcomings in that 21 of the 27 documents disregard important facets of OER and some documents even introduce measures which will or could hamper the adoption of OER by academics as well as the contribution of the Unisa community to OER.
- Policies or strategies also need to be revisited so that the online teaching environment is encapsulated in all of UNISA’s documentation.

It is evident from the review (Archer & Prinsloo, 2012) and from our knowledge of policies in the university, that older policies need to be revisited so that all procedures in the university are aligned – one incongruity that comes to mind is the Policy for prescribing textbooks which should state that OER must first be evaluated before a “copyright” or proprietary textbook may be prescribed.

Unfortunately policies are only as good as the practice that is enforced. The truth is that lack of knowledge of policies, enforcement, disabling factors or skills often result in policies not finding their way into practice. There needs to be clear communication regarding implementation of policies, a certain amount of activism and enthusiasm by champions. In order to ascertain if the policies have been sufficient to drive the university in this direction, one needs to identify where application has taken place. Currently, in Unisa the College of Education is urging the incorporation of OER rather than proprietary textbooks in their curriculum development. Other Colleges in UNISA need to put similar strategies in place, where appropriate. The authors are not aware of any similar practices in the university, but this is not to say that they do not exist in small pockets but not as college initiatives.

3.2 UNISA as a contributor of Open courseware:
The other side of OER is the contribution towards resources and courseware. In terms of UNISA’s social justice mandate as the “university in the service of mankind”, the UNISA community should be encouraged and enabled to contribute to open courseware and open resources. There are few examples of this in the Unisa community that the authors are aware of. The list is therefore not exhaustive.
- Open short courses – life consumersonscience, household food security, learn to speak an African language
- Open resources – Econ tutor (UNISA, 2012c)

The Centre for Accounting Studies is also launching an open resource in 2013, “Ethics in Accounting”. The module will be a freely available add-on to one or more of the modules offered.
by the centre. It is not envisaged that it will lead to a credit in a formal qualification but rather as an enhancement to existing or newly developed modules.

One of the pillars of OER is the use of collaboration or communities of practice to make courseware and resources openly available. An example of collaboration that is unfolding is the establishment of SATEA (South African Tax Educators Association). Founding members from most of the South African Institute of Chartered Accountant (SAICA) accredited universities have formed a coalition in order to inform research and for the purposes of tuition collaboration.

Taxation is a subject where content changes annually because of the changes to the Income Tax Act. The content of university courses at the accredited universities is onerous and prescribed by the professional body so that students can pass a professional qualifying exam. Tax academics have thus formed a unit that will initially produce podcasts/vodcasts as open resources that will be freely available on YouTube Edu. It is envisaged that this collaboration will lead to the development of taxation open courseware as well as research outputs.

3.3 UNISA, OER and the web
Education is increasingly using technology for delivery and therefore a way to share open resources or courseware is through the use of repositories and portals.
UNISA has an institutional repository situated on its open portal where about 5 000 items are available for sharing and it receives about 200 000 hits per month (www.unisa.ac.za/OER accessed 23 July 2012). Of these resources, 657 are from the College of Economic and Management Sciences.

Unisa Open has the following to say about itself “a portal to help students, staff and any OER users and producers worldwide to source high-quality resources. It provides a space for conversation and a starting point for those just making their acquaintance with OER. It also provides a showcase for the OER work being conducted at UNISA” (UNISA, 2012b).

3.4 Other expressions that corroborate OER endorsement by UNISA

OER University (OERu)
UNISA is one of 14 founding anchor partners of the OERu. Their planned contribution to the OERu logic model is stated on the web page as follows:
“On the African continent we seek to ensure the viability of higher education in the digital age. Our envisaged contribution to the components of the logic model for the OERu could possibly include:
1. Open curriculum: Selected contribution to OER curriculum
2. Open student support: Sharing our model of online student support – myUnisa
3. Open pedagogy: Contribution to the development of digital learning literacies
4. Open pedagogy: Sharing models of pedagogy and pedagogical policies
5. Provision of OER assets (textbooks, tutorials, journals)

The reason why UNISA joined OER Tertiary Education Network (OERTen) is stated as “Our vision to be ‘the African university in the service of humanity’, our locatedness on the African continent and our significant global footprint place us in the unique position to represent African perspectives within the OERTen network while displaying local relevance and global consciousness” (2011.11 Founding OERTen anchor partner statements).
Stance of UNISA leadership
Towards the end of 2011 the Principal and Vice-Chancellor of UNISA made the following statement in personal communication with the Minister of Higher Education and Training in South Africa: “The OER movement’s aspiration to open access strongly resonates with our open distance learning model where spatial, geographical, economic and demographic boundaries must be reduced to facilitate and increase access to higher education. We are in no doubt about the powerful potential of OER to change the nature of our social relations. By radically reconceptualising normative educational practices in our schools and in our universities, OER will change the way we think about education on our continent, but it will do so only when we have carefully considered its distinct advantages and usages for Africa.” (Makhanya M., 2011)

At the 2012 World Open Educational Resources Congress, UNESCO, Paris, UNISA became a signatory to the 2012 Paris OER Declaration and the institutional statement strongly emphasised UNISA’s commitment to OER (UNISA, 2012c). During June 2012 Prof Makhanya signed the Berlin Declaration to Open Access to Knowledge in the Sciences and Humanities (Mbambo-Thata, 2012).

4. Conclusion
It has been acknowledged that UNISA cannot ignore the movement to OER especially as it can be closely compared to the African culture of Ubuntu. As shown in the overview above, UNISA is committed to the OER movement and although the movement is a decade old since the coining of the phrase, UNISA is at the beginning of embarking on a new direction in its journey, one that will change the way that many activities are performed. There are still many challenges (these are a paper on their own) however the university management has indicated a strong commitment towards embracing the initiative.

By embarking on this journey UNISA can be a conduit through which education becomes the right and responsibility of the masses both within South Africa and on the African continent and “education is the most powerful weapon which you can use to change the world.” Nelson Mandela.

Note:

1Comprehensive universities offer both vocational diplomas and academic degrees.
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DEVELOPMENT OF OPEN EDUCATIONAL RESOURCES IN HONG KONG: A STATUS ANALYSIS

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Abstract
This paper attempts to assess the status of development of open educational resources (OER) in Hong Kong. It first outlines the potential for Hong Kong to develop OER. With examples in three types, it describes educational resources freely accessible from Hong Kong’s portals. It analyses the extent to which the resources are open, and points out that existing materials have a lot to be desired in terms of openness. The final part of the paper proposes strategies that may facilitate the development of OER that are more open.

Keywords
Open educational resources / OER; Open content; Open courseware; Hong Kong

Introduction
Hong Kong is one of the most advanced cities in Asia in terms of the education quality, internet penetration and technological infrastructure. It is natural to expect that OER would be able to flourish there, but the reality seems that OER development is still in its infancy. Within its length limit, this paper discusses the development of OER in Hong Kong. It begins by delineating the city’s potential for OER to develop. It quotes examples of freely accessible educational resources and offers a preliminary analysis of their development in terms of their openness so far. In the final part of the paper, it proposes strategies that may facilitate proper development of OER in Hong Kong.

Hong Kong’s OER development potential
Hong Kong has been among the top 50 countries with the highest internet penetration (Top 50 countries with the highest internet penetration rate, 2012). The number of mobile subscribers doubles the number of the city’s population and an overwhelming majority of the households are broadband service subscribers¹. Virtually all students at the tertiary, secondary and primary levels have mastered at least some skills related to searching the internet, uploading and downloading contents onto sites of various kinds (such as school intranet, Facebook and Wikipedia)². So, with such an infrastructure and community readiness, few people would expect Hong Kong to lag behind other developed regions in terms of OER development.

The quality of Hong Kong’s teaching professionals, as well as the curricula, has been well recognized. Take higher education for example. In the last few decades, higher education in Hong Kong has experienced rapid development. Relatively young universities, such as the Open University of Hong Kong (OUHK) and the University of Science and Technology (HKUST), have made distinguished achievements and received worldwide recognition in
various ways. Five universities from Hong Kong ranked in the top 200 globally while three ranked in the top 50 (QS World University Rankings: Overall in 2011). Also, universities in Hong Kong have taken three of the top five seats among Asian universities (QS Asian University Rankings: Overall in 2012). Higher education in Hong Kong has taken on a leading role in Asia and has built up a good reputation and recognition globally. At present, Hong Kong has eight statutory universities and two statutory institutes, along with several other tertiary institutions.

It would be reasonable to expect that the faculties in universities and teachers in schools in Hong Kong would produce quality learning materials for their students, and that many of these products are OER. The reality, which is quite different, is explained below.

Freely accessible educational content from Hong Kong portals

Resources considered as OER in this paper bear at least three basic and distinctive features. First, such resources are freely available to the public, which is one the key requirements for being “open”. Second, they are for educational purposes, rather than commercial endeavours. Third, they are all accessible on the internet.

There are many portals in Hong Kong offering open content that bears the three features of OER. The following are examples of the major ones.

Education Bureau platforms

First, the most notable provider of OER is the Education Bureau (EDB) of the Government of Hong Kong SAR. It offers open content for primary and secondary schools mainly through three platforms: Resource Banks (http://www.edb.gov.hk/index.aspx?nodeID=79&langno=1), Interactive Activities DIY (http://diy.twg.hk/teacher/exerciseCREATE.php) and a Resources Depository (http://resources.hkedcity.net/).

Resource Banks provides various free resources including: Learning and Teaching Resources, IT in Education, Kindergarten Teaching Resources, Native-speaking English Teacher (NET) Scheme and Resource Banks of Good Educational Practices. From the platform, a teacher can locate useful materials in many forms, such as curriculum documents, visual materials for arts subjects, and relevant music resources for reference. The platform also provides information about some useful learning activities conducted offline. It also offers links to other useful sites, such as Educational Television (ETV) (http://etv.edb.gov.hk/home-c.aspx) and EDB’s YouTube Channels (http://www.youtube.com/user/edbgovhk).

Interactive Activities DIY contains learning resources that have been developed by the EDB. There are different kinds of quizzes and tests including matching exercises, multiple choice, jumble sentences, reordering, sorting, fill-in-the blanks and so on. The site covers many subjects such as English, science, and technology. The learning objects or tools available on the website allow checking or viewing of answers, as well as restarting the activities.

The Resources Depository is a major component of the Hong Kong Education City (HKEdCity) website (http://www.hkedcity.net/index.php). It provides teachers, parents and students with a wide variety of learning resources, in the form of videos, animations, PowerPoint files, and so on. It covers a broad range of topics, subjects and themes.
Institutional portals to assist learning

Educational institutions, especially tertiary institutions, have developed a large number of online learning resources. Many of these resources are freely available for the public. One example is the English language learning resources provided by the universities in Hong Kong. The following are some of these sites:

- **Learning Resources** of the Independent Learning Centre, Chinese University of Hong Kong (http://www5.cuhk.edu.hk/ilc/index.php?option=com_content&view=article&id=93&Itemid=6&lang=en)
- **Online resources** of the English Language Centre, City University of Hong Kong (http://www.cityu.edu.hk/elc/language_resources.html)
- **English for Professional communication** of the English Centre, University of Hong Kong (http://www4.caes.hku.hk/epc/)
- **Virtual Language Centre**, Hong Kong Polytechnic University (http://vlc.polyu.edu.hk/)

At these sites, numerous exercises and other tools for language learning are offered. There are also portals providing contents for teachers' use only. A popular example is **TeleNex** (http://www.telenex.hku.hk/telec/pmain/openreg.htm), which provides a wide variety of resources for English language teachers in Hong Kong Schools.

Another example worth mentioning is **Self Learning College** (http://self-learning-college.org/). The portal, as a virtual college, was established by a volunteer and has been maintained and supported by the volunteer himself. It provides a broad variety of learning materials, mostly text-based rather than multi-media, as references.

Open courseware

The last two types of OER serve mainly reference or learning-support purposes, and the materials in individual sites have not been designed as courses. Unlike these two types of which there are many examples, there seems to be substantially less open courseware (OCW) available. The major provider of such resources appears to be the OUHK. The OUHK offers OCW through its **Free Courseware** website (http://freecourseware.ouhk.edu.hk) and an external platform, **iTunesU**.

In OUHK’s **Free Courseware** website, there are a large number of topics and units of open learning content. Visitors to the site may select a particular topic of interest. They may then follow the instructions and will be presented with the study content, which includes text, video and audio materials. Users will also be referred to relevant websites and other reference texts. Scattered among the course are learning activities and assessments (such as quizzes, fill-in-the-blanks, and multiple choice questions) which ask for learner inputs.

The OUHK joined **iTunesU** in 2010 and was one of the first institutions in Asia Pacific to make its content available on Apple’s **iTunes Store**. Top universities and institutions such as museums, libraries and broadcasters around the world have been distributing their educational contents on the platform to students, faculty and the public. Contents on it can be easily searched, viewed, downloaded and played conveniently on mobile devices anytime, anywhere, in addition to being available on a desktop computer. OUHK’s content in **iTunesU**, accessible at http://itunesu.ouhk.edu.hk, includes
contents for Chinese business law, basic Chinese, corporate governance, China studies, environmental studies and investor education.

There are also isolated portals providing course-like resources. For example, the University of Hong Kong provides Knowledge Building (http://lcp.cite.hku.hk/resources/KBSN/intro/default.html) and Critical Thinking Web (http://philosophy.hku.hk/think/). Knowledge Building is an open online course for teachers who wish to learn how to conduct knowledge building activities in their teaching through Information Communication Technology (ICT). Organized into modules, Critical Thinking Web provides over 100 online tutorials on different aspects of thinking skills.

Extent of openness of the educational resources

Educational institutions in Hong Kong have made use of the internet technology to provide educational resources. The examples listed above offer fair evidence that the technological potentials have been well exploited in Hong Kong. However, in terms of the degree of openness, the present developments are far from satisfactory. One of the most common framework for assessing the extent to which content is open is the 4Rs, as stated on the OpenContent website (Wiley, n.d.). They are:
1. Reuse — the right to reuse the content in its unaltered/verbatim form (e.g., make a backup copy of the content)
2. Revise — the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
3. Remix — the right to combine the original or revised content with other content to create something new (e.g., incorporate the content into a mashup)
4. Redistribute — the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

Copyright requirements for the use of the educational resources listed above appear to be highly restrictive. In general, the portals quoted in the previous section do not allow remixing, revision or redistribution. Many do not even allow users to keep their own backup copy.

For example, at the entrance of the Interactive Activities DIY, the following copyright statement is conspicuously posted, and users have to indicate that they have read and agree to it before they can proceed to access the content in the portal:

These teaching resources are developed by the Education Bureau of the Government of the Hong Kong Special Administrative Region for teachers’ use to facilitate learning and teaching in Hong Kong. The copyrights of these teaching resources belong to the Government of Hong Kong Special Administrative Region. Except prior written authorization is obtained from the Education Bureau, any reproduction, adaption, distribution, dissemination or use for commercial purposes is strictly prohibited.

In the institutional portals, the copyright line indicating “all rights reserved” is normally put at the bottom of every content webpage of the learning resources. For iTunesU, copyright is similarly protected and users are prohibited from doing the 4Rs.

There are only a few exceptions, allowing more openness. One most open example is Critical Thinking Web. Licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License, it allows revision, remixing and redistribution for non-profit making purposes. However, most others still impose tight protective copyright jackets. For instance, TeleNex, which allows teachers to reuse their materials for teaching-related purposes, states in their “Conditions of Use” webpage that no part of their website “may
be may be reproduced, stored in a retrieval system, or transmitted, without the prior permission in writing” from its owner, the Teachers of English Language Education Centre of the University of Hong Kong.

Such protection inhibits the realization of openness. A vision to promote open education in the Cape Town Open Education Declaration: Unlocking the promise of open educational resources (http://www.capetowndeclaration.org/) of 2008 was stated as: “educators worldwide are developing a vast pool of educational resources on the internet, open and free for all to use. These educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge…” Three strategies were proposed to increase the reach and impact of OER:

• Encourage educators and learners to actively participate in the emerging open education movement. Participating includes: creating, using, adapting and improving open educational resources; embracing educational practices built around collaboration, discovery and the creation of knowledge; and inviting peers and colleagues to get involved. Creating and using open resources should be considered integral to education and should be supported and rewarded accordingly.

• Call on educators, authors, publishers and institutions to release their resources openly. These open educational resources should be freely shared through open licences which facilitate use, revision, translation, improvement and sharing by anyone. Resources should be published in formats that facilitate both use and editing, and that accommodate a diversity of technical platforms. Whenever possible, they should also be available in formats that are accessible to people with disabilities and people who do not yet have access to the Internet.

• Have open education made by a high priority governments, school boards, colleges and universities. Ideally, taxpayer-funded educational resources should be open educational resources. Accreditation and adoption processes should give preference to open educational resources. Educational resource repositories should actively include and highlight open educational resources within their collections.

For the policy makers and senior management of educational institutions who wish to have a more open environment for education to flourish, these strategies should be useful guidelines to follow.

Conclusion

This paper has highlighted that Hong Kong is an educational hub with a high level of technological development and therefore possesses favourable conditions for the development of OER. However, through closely examining major freely accessible education resources available from Hong Kong’s portals, this paper has illustrated that the current level of openness of our resources is still unsatisfactory. Technological readiness is no doubt a necessary condition for OER to become popular. Yet, it is not a sufficient condition for OER to thrive or prosper, as the relevant phenomenon of Hong Kong suggests. To achieve our goals of attaining more openness in education resources, we must make greater efforts and implement strategies similar to those proposed in the Cape Town Open Education Declaration.

Notes

1 In December 2011, the household broadband penetration rate was 86.6%, and there were 14,930,948 mobile subscribers, with mobile subscriber penetration rate of 210.2%. (Ref.: http://tel_archives.ofca.gov.hk/en/datastat/key_stat.html, retrieved on August 10, 2012)
3 The OUHK has recently initiated a project to develop an open textbook system. It is expected that its OCW provision will be richer and more appealing to OER users.

References
Abstract

Open Education Resources (OER) vary in the types ranging from textual articles and podcasts to multimedia animations and simulations. The media used to access the OER also range from television and desktops to tablets and mobiles. The paper proposes a schematic representation of different formats of OER categorized on the basis of user-involvement each format offers.

The need was felt to research in effectiveness of two different formats, one with presentation mode and the other in the format of exploration tasks. Learning resources were designed to learn open-source design software ‘MyPaint’. Guided exploration tasks were designed based on constructivist principles and Screen-cast videos were developed for presentation mode.

Two different sample groups, one consisting of 18 Applied Art learners and the other consisting of 18 Educational Technology learners were selected for this study. Two-group pre-post test experimental design was selected. The tests were based on the skills of MyPaint software.

Each sample group was divided into two equated groups. One was provided screen-cast videos and the other with Guided exploration tasks. Both the formats of educational resources were proved effective in training software skills. No significant difference was found between achievement scores of both the groups.
Introduction

Development and research in the area of computer assisted learning did not see major change in its nature till the intervention of internet in education. Web 2.0 tools have provided revolutionary dimension to the field of eLearning and now only sky is the limit for research and development in the field of ICTs in education and training. eContent in various forms such as articles, PDFs, videos, podcasts, e-books, games, animations, simulations, etc are accessed through various media tools such as desktops, tablets, mobiles, television and i-pod.

Globalization and need of sharing educational resources not only widened the scope of research, but also led to explorations of numerous formats of ICT-integrated education. The introduction of Open Education Resources (OER) in the field of education is making the phenomena of ‘Education for All’ true as no one is denied to the web-based resources. The way OER resources are increasing day-by-day, the experts contributing to the OER are gaining utmost satisfaction of spreading quality content and sharing knowledge with all those from every corner of the world who otherwise might have never gained this wealth of knowledge. OER is a quality response to the resources which are copyrighted.

OER nature of the content has increased responsibility of the experts since the content is being used widely by several users across the globe. As quality of the content is an important issue, providing different types of resources for different types of users also becomes a responsibility of the content providers. Today eContents are being generated with utmost freedom to select and design any eContent format. A few efforts seem to have made to classify educational resources, but those mainly talk about their own repositories.

This article describes some of the systems by which educational resources are generally classified or composed. It will also relate these systems to the way in which Wikiversity can structure itself and guide users in the creation of educational resources.

The Wikiversity (2011) article categorizes OER resources into 9 heads. (Please refer to Fig. 1 to 3 for categories provided by repositories recognized world-wide.)
Material Types

- Animation (1,213)
- Assessment Tool (135)
- Assignment (817)
- Case Study (664)
- Collection (3,495)
- Development Tool (205)
- Drill and Practice (1,376)
- ePortfolio (128)
- Learning Object Repository (689)
- Online Course (3,117)
- Open Journal-Article (1,007)
- Open Textbook (2,202)
- Presentation (4,261)
- Quiz/Test (851)
- Reference Material (8,219)
- Simulation (3,011)
- Social Networking Tool (106)
- Tutorial (3,790)
- Workshop and Training Material (435)

Fig. 1 Material Types in MERLOT repository

(Source: http://www.merlot.org/merlot/materials.htm?sort.property=dateCreated)

Fig. 2 Material Types in OER Commons
These various categories provide an insight to generic nature of OER. The OER material provides a wide range of media involved, level of complexity of material development and also a wide range of interactivity the material ultimately provides to the user. The OER, at one hand, comprises of huge static content developed and published for the learners and teachers and at the other hand, an environment to enable users create a new live dynamic content on their own. OE content can be classified according to the level of interactivity it provides to the learner. The broad schema is presented in Fig. 4.
With the emerging formats of OER, the need is felt of experimenting with several available formats so as to find its usability and effectiveness in different settings.

**Review of related studies:**

Research in Guided Exploration was initiated way back in 2001, which continued considering various aspects such as situated cognition, Minimalism, androgy and other cognitive strategies of learning. The studies have generally revealed that cognitivist and constructivist approaches prove effective in acquiring skills and higher cognitive skills. (Debowksi S, Wood R., Bandura A., 2001; Hurt, A., 2007; Craig, J. M. B., 2012)

The medium of screen-cast videos is also being explored for its aspects ranging from multimedia design to its educational significance. Effectiveness of screen-cast videos has been tested for its effectiveness in face-to-face as well as web-based environments.
Usability, GUI, narration in digital videos have been a few significant variables which have attracted researchers in recent years. (Cripps, Michael J., 2009; Mohamad Ali, 2011; Ramsey, Musallam, 2010, Thompson, Riki, Lee, Meredith J., 2009).

Here is an attempt to experiment with two formats of eContent, one of which is a form of presentation and the other is exploratory in its nature.

The two selected formats of content for the study are Screen-cast videos and Guided exploration material. Screen-cast videos are widely being used in software-training, whereas Guided Exploration strategy is used in various other learning areas, though not so widely in the area of software training. An attempt was made to conduct a comparative study if any of the material types prove more effective.

**Screen-cast Videos**

Screen-cast video are achieved by recording procedures in the software run by capturing movements on the desktop. Basically all movements displayed on the display screen are captured as a video and hence software procedures can be performed and captured so as to produce demo for training purposes. Audio narration in any language can be recorded. There are several tools to facilitate record screen-movements and also embed audio in the same. (Aune S., 2008)

A project in India of creating huge resource of screen-cast videos with regional language narrations is named as ‘Spoken Tutorial’. The project is initiated by IIT Bombay team and supported by several IITs and other technology institutes of India. It is like a normal tutorial that captures the changes in the screen in the form of a movie, followed by a running commentary of it by an expert at the same time. Spoken tutorial can be used to explain the steps involved in carrying out an activity, such as using some software. (Moudgalya K., 2009)

**Guided Exploration**

Guided Exploration is a problem-solving strategy, in which the sequencing of search activities and responses to problematic situations are predetermine.

Tasks that are to be accomplished are designed and arranged in a systematic order according to the level of increasing difficulty. The guided enactments of practice tasks ensure that the novice has a progressive sense of achievement, which strengthens perceived efficacy for the more demanding forms of the task and satisfaction with progress. (Debowski, et. Al., 2001)

**MyPaint**

The study reported in this paper is a comparative study of effectiveness of Screen-cast videos and Guided exploration material for learning software ‘MyPaint’.
‘MyPaint’ is open source graphical software specially developed for Digital painter. Digital painters are those who make their artistic creations by using computer with different graphical software.

![Fig 5 Working screen of MyPaint software and Brush effects available in MyPaint](image)

**Objectives of the study:**

- To test the effectiveness of Guided Exploration material.
- To test the effectiveness of Screen-cast videos.
- To compare effectiveness of Screen-cast videos and Guided Exploration material.

**Hypotheses**

H0.1 - There will be no significant difference between the achievement of the group using Screen-cast videos and the group using Guided Exploration material

H0.2 - There will be no significant difference between the scores of pre-test and post-test of the group using Screen-cast videos.

H0.3 - There will be no significant difference between the scores of pre-test and post-test of group using Guided Exploration material

The scope of this study was restricted to two student centered approaches mentioned above.

**Research Design**

Experimental method with two-group pre-post test experimental design was used for the study.
Two different sample-groups were decided. The sample consisted of 18 undergraduate learners of Rachana Sansad Institute of Applied Art, Mumbai. The group was from Drawing and Painting background and conversant with computer, but not familiar with ICT-based training strategies. The other group consisted of 18 participants from Graduate degree programme offered at the Department of Educational Technology, SNDT Women’s University, Mumbai. They did not have any background in the field of Applied Art, but all were used to ICT-based teaching-learning strategies. The initial sample was 23 Educational Technology learners. Since this group was exposed to several other applications in education and training, 5 of them could use the software upto the mastery level at the pre-test and hence were omitted from the study.

Since both the sample groups were from different backgrounds, two separate studies were conducted with no intention of clubbing or comparing them.

Achievement tests were prepared to test the effectiveness of both the strategies in learning the software skills of MyPaint. Pre and post-tests were designed with the help of a common blue-print. The tests consisted of two major tasks, one of which was divided into 3 sub-tasks. The tests were of 20 marks each. The tests were validated by the experts in the field of Education and Applied Art.

Quantitative data analysis was done using t-ratio.

**Development of material:**

Screen-cast videos were produced using Cam Studio, the Opensource screen-casting software. The script of the tutorials was prepared before actual recording so as to bring accuracy. There were 10 videos of 3 to 4 minutes each.

Tasks for Guided exploration designed in such a way that the learner will acquire important skills of using MyPaint by trying out the tasks. The tasks were designed in light of the same skills addressed in the screen-cast videos. The complexity and sequence of skills to be achieved was also maintained in both the formats. A few guidelines regarding use of options in the software were also provided alongside the tasks as it was Guided exploration material.

Both the groups were administered pre-test in which they were provided with some tasks with the use of MyPaint, without any guidelines. They were expected to perform the tasks within 2 hours. Two parallel groups of each sample group were formed. One of the parallel groups was provided with the screen-cast videos to view and learn the software, whereas the other group was provided with the Guided exploration material. Thus, two groups used screen-cast videos and two groups used Guided exploration tasks.

The learning experiences were planned for about 5-6 hours. Individual learner took different time for learning. Post-test, parallel to the pre-test was administered on all the groups.
Data-analysis:

Since the hypotheses set for the study needed to be tested by using t-ratio, the following three differences in terms of t-ratios were computed:

1. Pre-test and post-test of Sample 1 (Applied Arts learners) using Screen-cast videos
2. Pre-test and post-test of Sample 2 (Educational Technology learners) using Screen-cast videos
3. Pre-test and post-test of Sample 1 using Guided exploration material
4. Pre-test and post-test of Sample 2 using Guided exploration material
5. Post-test scores of Sample 1 (Applied Arts learners) using Screen-cast videos and using Guided exploration material
6. Post-test scores of Sample 2 (Educational Technology learners) using Screen-cast videos and using Guided exploration material

Table 1 and 2 present t-ratio of Pre-test and Post-test scores of sample using Screen-cast videos.

Table 1

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>4.778</td>
<td>1.541</td>
<td>18.818</td>
<td>2.898</td>
</tr>
<tr>
<td>Post-test</td>
<td>14.444</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The obtained value of the t-ratio as shown in the table is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was rejected at 0.01 level of significance.

Mean of Sample I (Applied Art learners) was 4.78 which increased to 14.44. Two of the participants achieved mastery and the lowest achieved score was 60%.

Table 2

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The obtained value of the t-ratio as shown in the table is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was rejected at 0.01 level of significance. Except two, all others achieved mastery level of skills (80% or more) in this group. The overall performance was better than Sample I as Educational Technology learners are exposed to several application software.

Table 3

t-ratio of Pre-test and Post-test of sample I (9) using Guided exploration material

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>13.056</td>
<td>1.976</td>
<td>6.662</td>
<td>3.36</td>
</tr>
<tr>
<td>Post-test</td>
<td>17.444</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The obtained value of the t-ratio as shown in the table is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was rejected at 0.01 level of significance.

Two of the participants achieved mastery and the lowest achieved score was 60% in this group. Though the group was from Applied Art background, they were not familiar with learning by exploration.

Table 4

t-ratio of Pre-test and Post-test of sample II (9) using Guided exploration material

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>4.889</td>
<td>1.620</td>
<td>16.459</td>
<td>3.36</td>
</tr>
<tr>
<td>Post-test</td>
<td>13.778</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>12.833</td>
<td>2.878</td>
<td>5.849</td>
<td>3.250</td>
</tr>
<tr>
<td>Post-test</td>
<td>18.444</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The obtained value of the t-ratio as shown in the table is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was rejected at 0.01 level of significance.

Except one, all achieved mastery in this group.

The Educational Technology learners of this group shared that they acquired the skills of using MyPaint mainly because they were allowed to explore the package by themselves. None of them complained that they were deprived of videos. On the contrary, they shared about their rich learning experience with the group viewing videos.

Table 5

Post-test scores of Sample I (Applied Arts learners) using screen-cast videos and using Guided exploration material

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test of sample using Guided exploration material</td>
<td>13.778</td>
<td>1.904</td>
<td>0.966</td>
<td>3.250</td>
</tr>
<tr>
<td>Post-test of sample using Screen-case videos</td>
<td>14.444</td>
<td>1.871</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The obtained value of the t-ratio as shown in the table 5 is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was retained. No significant difference was found between effectiveness of both the strategies.

Table 6
Post-test scores of Sample II (Educational Technology learners) using Screen-cast videos and using Guided exploration material

<table>
<thead>
<tr>
<th>Name of the Test</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-ratio</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-test of sample using Guided exploration material</td>
<td>18.444</td>
<td>1.750</td>
<td>1.650</td>
<td>3.250</td>
</tr>
<tr>
<td>Post-test of sample using Screen-case videos</td>
<td>17.444</td>
<td>2.883</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The obtained value of the t-ratio as shown in the table 6 is higher than the critical value at 0.01 level of significance. Therefore, the null hypothesis was retained. No significant difference was found between effectiveness of both the strategies.

**Conclusion:**

The present study was a small effort of researching with the formats of OER and instructional approaches woven in the design OER. The study proved that both the formats prove effective in learning and acquiring skills on your own. Many more studies in this area will certainly enrich repositories of the quality resources. Similar studies can be conducted on larger samples to test and compare different formats. The generalized results will help instructors to choose from the existing resources as well as add to the resources.

**References**


ONE MONGOLIA: BUILDING AN OPEN NETWORK FOR EDUCATION IN MONGOLIA

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Abstract

Since the transition from a planned economy to a market-based democracy in the early 1990s, Mongolian higher education has experienced rapid expansion. Between 1992 and 2007, the number of tertiary education institutions has increased more than four-fold and enrollment more than six-fold. But despite this growth, many Mongolians believe the quality of education remains poor, although the costs of higher education are increasing. Introducing and adapting open educational resources (OER) for the Mongolian higher education sector could help reverse these trends.

One possible strategy that the Ministry of Education could consider is the adoption of a learning technology-based pedagogy that might enable a fairly rapid transformative process while at the same time improve on the quality of content as well as create a population of instructors, teachers and learners familiar and comfortable with using web-based open educational resources.

The International Development Research Center (IDRC) Canada, through the DREAM IT project has supported the development of an emerging open education strategy for Mongolia. The ONE Mongolia initiative, discussed in this paper, will become the successor to DREAM IT project with the goal of supporting Mongolia’s emergence as a learning nation with a knowledge economy based on open development principles.

Keywords: Mongolia, open educational resources, open development, policy advocacy
ONE MONGOLIA: BUILDING AN OPEN NETWORK FOR EDUCATION IN MONGOLIA

Introduction
Mongolia is a developing nation in Asia, with Russia on its northern border and China on its southern, eastern and western borders. Mongolia had a democratic revolution in the early 1990s that led to a multi-party system, a new constitution in 1992, and transition to a market economy. The country continues to develop rapidly.

Mongolia has a well-developed system of education from primary to tertiary levels including institutions for technical and vocational education and training (TVET). There are 750 general education schools with about half a million students and about 150,000 higher education (HE) students in Mongolia. The Ministry of Education oversees the development and progress of education and training at all levels (Weidman, 2002; Steiner-Khamsi, 2007).

The Mongolian education system has several components:

- Preschool and kindergarten
- 4 years of primary education, beginning at age 8
- 4 years of lower secondary education, with compulsory education ending after Grade 8
- 2 years of upper secondary education
- Post-secondary and higher education
- Technical education and vocational training (Weidman, 2002)

The reforms of Mongolian education have evolved it from a system of education based on the Russian model to a more flexible system, including improving the efficiency and effectiveness of education at all levels through rationalization and decentralization. Since the 1990s, there has been a relaxation of state control over curriculum in Mongolia with efforts at diversification based on local community needs and shifting from a teacher-centered to a more student-centered curriculum (Weidman, 2002).

The TEVT component comprises specialized upper secondary schools as well as post-secondary diploma programs housed in higher education institutions. Non-formal and distance education activities cut across the entire system (Government of Mongolia, 1999; Weidman, 2002).

Since the transition from a planned economy to a market-based democracy in the early 1990s, Mongolian higher education has experienced rapid expansion. Between 1992 and 2007, the number of tertiary education institutions has increased more than four-fold and enrollment more than six-fold. But despite this growth, many Mongolians...
believe the quality of education remains poor, although the costs of higher education are increasing.

In addition, the government has allowed the development of a private higher education sector that is approaching half of the total students in Mongolian higher education. Commerce and business administration degree programs enroll the largest numbers of students in private institutions, and more students are studying law in private than public sector higher education institutions (Weidman and Bat-Erdene, 2002).

A recent proposal at educational reform has considered a revisit of the 2-year upper secondary education program by reducing the time spent in this component to just one year. Such a reform would result in two things:

1. The reduction of the total number of years in school before post-secondary education to nine years [post pre-school]
2. A revision of the upper secondary curriculum and its subsequent impact on the higher education curriculum.

The Ministry of Education has been grappling with both of the above and related issues. Among the difficulties encountered are:

- The transformation of the curriculum into a syllabus.
- The creation of learning materials to support the syllabus
- The induction of teachers to deliver the courses, and
- The retraining of teachers for new educational models

All of these are challenging but especially challenging are items 1 and 2 which would determine among other things both the quality of the outcomes of change and the richness of the teaching and learning environment.

One possible strategy that the Ministry of Education could consider is the adoption of a learning technology-based pedagogy that might enable a fairly rapid transformative process while at the same time improve on the quality of content as well as create a population of instructors, teachers and learners familiar and comfortable with using web-based open educational resources.

Supporting Open Development Practices in Mongolia
The International Development Research Centre of Canada (IDRC) has been active in Mongolia for over 20 years and has invested in information and communication technology (ICT) research through its IT for Development (IT4D) program and more recently through its Information Networks (IN) program. The IDRC research program in Mongolia is coordinated by a project team responsible for Development Research to
Empower All Mongolians through Information and Communications Technologies (DREAMIT – http://dreamit.mn).

Over the past two years, the DREAMIT project has been active in capacity-building initiatives to introduce and demonstrate a range of open practices, including open government, open data and open access publishing. Most recently DREAMIT has focused some of its research activities specifically at demonstrating open practices in the government, research and education sectors. Some example projects are discussed in the sections that follow.

Open government
One focus of IDRC-funded research has been open government initiatives through a project called Engaging citizen e-participation in the Parliamentary legislative process. The Mongolian Parliament opened its website in 1998. The website www.parliament.mn contained a range of information on the activities of Parliament, such as transcripts of the Parliament sessions, proposed bills before Parliament, archives, photo galleries, information about Parliament members, and plans about Parliament sessions and discussion about them.

Citizens, businesses, government and non-governmental organizations (NGOs), and international organizations have used information and resources from the website. Parliament has established “promotion centres” in 20 aimag centres (province-like administrative units in Mongolia) and in the 7 districts of the capital, Ulaanbaatar, to serve as access points for citizens to gain access to information and resources from Parliament. However, the Parliament website had been transferring a one-way flow of information and communication (i.e. from Parliament to citizens), and had not been making use of new social technologies to improve bi-directional communication flows.

The Engaging citizen e-participation in the Parliamentary legislative process research project was implemented during 2009-2010 by the Secretariat of the Parliament of Mongolia under the supervision of the DREAM IT project. The objective of the project was to understand the factors that motivate or inhibit citizens from using the Parliament website. The project studied the accessibility of the Parliamentary website for citizens of Mongolia regardless of gender, age, education, geography or socio-economic status, and in particular, it focused on citizens who lived in rural parts of Mongolia and specifically those of underserved communities.

A roundtable meeting, supported by IDRC to discuss the outcomes of the project, was held on March 29, 2012 in Parliament House in Mongolia. More than 30 people attended the roundtable discussion, among them members of the Parliament of Mongolia, the director of the Mongolia Voter Education Centre, World Bank representatives and other representatives of civil society in Mongolia, as well as 10 media agencies. Interest in open government and open data practices continues to grow
in Mongolia through efforts of the DREAMIT project to promote open practices at all levels of society.

Open research and open access publishing
DREAMIT has supported research in environmental science through a number of projects including, Collaborative learning for co-management of natural resources in Mongolia, and Reading the weather: ICTs for climate risk management and herders' livelihoods improvement in Mongolia.

The principle researcher for the environmental science projects has made an effort to openly publish the findings from his first DREAMIT project using a Creative Commons share-alike (CC-BY-SA) license that allows for download of the book and reuse of the material with appropriate attribution.

It is expected that research from the second project on climate risk management will also be openly published using CC licenses.

Figure 1. Research published as a book licensed using a Creative Commons CC-BY-SA license

Open educational resources
Starting in 2010, the DREAMIT project brought consulting expertise from Canada to Mongolia to introduce models of practice associated with open educational resources (OER). The consulting visits were also designed to stimulate local interest in OER research projects in Mongolia, with a focus on exploring and investigating potentially transformative education strategies for the country.

A national seminar on Open Educational Resources sponsored by DREAM IT and IDRC was held in Ulaanbaatar in October 2010. This seminar introduced Mongolian educators and government officials to OER projects worldwide and provided opportunities for in-depth discussion about the merits and mechanics of open education principles and practices. Information about the 2010 OER activities in Mongolia can be found at http://bit.ly/DREAMIT_OER_OCT2010. Following the seminar, DREAMIT made a call for proposals to Mongolian educational institutions and NGOs with an interest in conducting OER research projects. Three target topic areas were identified, including:

- Research about practice changes. When integrated into an existing educational practice, the adoption of an OER strategy might lead to new forms of practice. Research in Mongolia on the impact and benefits of OER on existing practices
could be studied by analyzing how an OER strategy affects the efficiency of the educational materials development process. This study could provide a side-by-side comparison of existing and new models of practice.

- Research could also explore the capacity and ability of educational developers and teachers to quickly revise and redistribute updated or enhanced materials using network delivery technologies. Findings from such a study would benefit school operations and teacher training in Mongolia, and could be beneficial also in other developing countries.

- OER may also enable qualitatively new practices and new approaches in organizing teaching and learning. These effects could also be studied, documented and evaluated through ongoing research in schools with teachers and students.

In September 2011, a follow-up workshop on open data, open government and OER was held (http://bit.ly/DREAMIT_OER_SEPT2011). At the 2011 workshop, research projects funded by IDRC through DREAMIT presented preliminary research results and demonstrated materials that each would make accessible as OER using CC licenses.

Davlagaa.mn (Education Wave), an NGO that was funded through DREAMIT to research the development of an open training and materials development strategy for pre-school teachers presented its work at the national seminar, and launched a book that it had developed separately with a publisher partner. Davlagaa make the book chapters openly available to the teachers, parents and the public through its website using a Creative Commons share-alike, non-commercial license (CC-BY-SA-NC). The work of the Davlagaa project team can be viewed at http://www.davlagaa.mn. Davlagaa has also experimented with user-generated videos produced by pre-school teachers that can be viewed or downloaded from its website along with other openly licensed resources designed for pre-school education.
Ramping up a Creative Commons (CC) Mongolia Affiliate as basic open infrastructure

As a result of the DREAMIT projects, there is growing interest across Mongolia for the use of Creative Commons licensed educational resources by instructors, institutions and government. CC licensed materials would provide a legal and technical infrastructure essential to the long-term success of OER. In addition, confidence in moving in this direction and the development of public policy would require localized versions of the Creative Commons licenses written in Mongolian. Currently, Mongolia is not among the more than 70 CC jurisdictions worldwide with an official CC affiliate, although the CC licenses have been in use since 2011.

IDRC Canada, through the DREAM IT project has supported the roadmap development for a CC Mongolia affiliate. A Creative Commons Mongolia affiliate is expected to expand upon initial OER activities as well as help boost human capital development and lifelong learning initiatives across Mongolia by working with education providers in both
the formal and informal sectors to promote knowledge and skill acquisition through the use and open licensing of learning resources.

The specific objectives of Creative Commons Mongolia affiliate are:

- Support collaborations and partnerships to maximize government investments in education, including the sustainable development and distribution of educational materials and the sharing of digital resources by the public, parents and students across Mongolia
- Support government, institutions, and organizations in the open licensing of data sets, copyright works, research reports, statistics, photographic images, educational resources, and other digital resources
- Complement laws pertaining to copyright and fair use by enabling creators to assert rights and communicate permissions for use, reuse and distribution
- Enable innovative new business models in the public and private sectors using open data
- Support the revision of policy regulating the production and use of open educational resources for general education and other public services
- Contribute to raising awareness and adoption of open licensing frameworks for authors, educators, creators, and businesses
- Promote creative and innovative activities that can deliver social and economic benefits for Mongolia and Mongolians

The Creative Commons Mongolia affiliate has an initial starting base in the higher education sector. Currently, the four largest Mongolian universities, the Mongolian University of Science and Technology, the National University of Mongolia, the Health Sciences University and the Mongolian State University of Education are participating in this initiative and will invite participation from other public and private universities. It is expected that memorandum of understanding (MoU) between Creative Commons and representatives of Mongolian universities will be signed in October 2012.

**Looking Ahead: Open Network for Education in Mongolia (ONE Mongolia)**

What remains to be done is the development a framework for the use of open education resources (OER) to support innovative practice models for teaching and learning, and instructor training in all education institutions. Specifically a consortium of education institutions will need to address the following requirements going forward:

- Design a collaborative capacity-building process that will inform and train university faculty and instructors about the concepts and practices for using OER to support effective teaching and learning
- Develop collaborative technical infrastructure for creating training materials and sharing OER as examples of innovative practice for university educators
• Develop a set of standards and practices for the creation, maintenance and distribution of OER in higher education in Mongolia
• Develop a set of standards and practices for the translation and/or localization of externally developed OER for use in Mongolian higher education institutions and sources
• Identify other innovative research activities that will add value to existing and planned OER programs and contribute new knowledge about OER use to the wider academic community

At a 2012 national seminar in Ulaanbaatar, D. Enkhbat, Internet businessman and former parliamentarian introduced his vision for a ONE Mongolia project (Open Network for Education in Mongolia). The ONE Mongolia project will become the successor to DREAM IT project with the goal of supporting Mongolia’s emergence as a learning nation with a knowledge economy based on open development principles and the use of open educational resources for education and public services. Key to Enkhbat’s vision for the One Mongolia project and consortium is the notion that it must be national in scope, collaborative in nature, bringing together all sectors of Mongolian society under a common vision, to model open development principles.

ONE Mongolia has been proposed with the following vision, objectives and partners.

1. Vision
   • Mongolia will become a learning nation with a knowledge economy based on open development principles.

2. General Objective
   • Advocate policy promoting the production and use of open educational resources for education and other public services
   • Support collaborations and partnerships for the development of open knowledge, and provide free access to OER to maximize government investments in education
   • Promote the sustainable development, access and distribution of open educational materials and digital resources in Mongolia by government, academia and industry
   • Build a research agenda based on critical needs

3. Specific objectives
   • Raise awareness about open licensing frameworks among authors, educators, creators, businesses
   • Promote the endorsement of the UNESCO OER Declaration (June 2012) by the Government of Mongolia, specifically including the principle that educational resources paid for with public funds should be openly licensed
• Establish a Creative Commons (CC) affiliate and open licensing framework for Mongolia
• Build capacity among faculty, instructors and education practitioners to use and create open educational resources
• Experiment with crowd-sourcing to build community and resources

4. Partners: Bring together influential partners from all sectors of society
• The Office of the President of Mongolia
• Ministry of Education, Culture and Sciences
• Mongolian Academy of Science
• Public and private universities
• Faculty, teachers and instructors
• Members of Parliament
• Business community and publishers
• International donor organizations

Conclusion
The International Development Research Center (IDRC) Canada, through the DREAM IT project has supported the development of an emerging open education strategy for Mongolia. Initial successes have demonstrated willingness and an appetite on the part of education practitioners to consider OER as a transformative strategy in education. What remains, is for a consortium of key educational players in Mongolia to move forward toward policy advocacy and change through a countrywide initiative that demonstrates the potential and power of large-scale open development practices.

The ONE Mongolia project, briefly outlined in this paper, will become the successor to the DREAM IT project, with the goal of supporting Mongolia’s emergence as a learning nation with a knowledge economy based on open development principles.

References


OPEN EDUCATIONAL RESOURCES (OER) FOR EMPOWERMENT OF OPEN SCHOOLS

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Abstract

In this paper an attempt has been made to discuss on the initiatives taken in developing Open Educational Resources (OER) for strengthening the open schooling system in India. The OER has become a movement worldwide for not only acquisition of knowledge in a digitized form but also has the significant characteristics to be repository of updated knowledge. No doubt this revolutionary initiative has come a long way in recent years for developing countries as blessing for increasing access to quality resource materials which not only facilitates learning but also links education with livelihood.

1. Introduction

Education has no longer remained as either the prerogative of institutions or the state, and even knowledge has crossed the boundaries of ‘Gurus’ (teachers). Thanks to Information and Communication Technology (ICT) which has not only brought the revolutions in the education system but also changed the strategies for learning amongst the young masses. As one progress in the present century, almost every day new and advanced technologies are getting evolved and thereby the strategies for learning are also getting updated in the educational institutions. The role of teachers in the context of planning learning strategies in the classrooms is getting replaced with the updated inputs as supported by the ICT. The policy planners, education providers and other players in the system, including parents, also need to get themselves updated to the changing scenario. As been observed, the teachers are supposed to be repository of knowledge in their respective fields and thereby can essentially facilitate the learning of the students effectively. This calls for self renewal of the teachers on a continuous basis to further strengthen this repository of knowledge. The educational institutions shall have to support for this cause to achieve its goals and objectives. It is in this context the open educational resources (OER) play a significant role to strengthen the education system in the developing world.

2. OER: The Movement

The Open Educational Resource (OER) materials are the digitized version of the learning materials that are available freely and openly for learners, teachers and scholars to use and re-use for teaching learning and research activities. The basic objective of OER initiative is to have open movement worldwide to explore the effective and efficient systems to create, share and evolve open educational learning
materials. The UNESCO has been strongly advocating placing OER into practice. The Free/Libre Open Source Software (FLOSS) movement, at the initial years, joined with OER on the issue related to concretizing how to create resources and those could be re-used and freely maintained. The basic strategy adopted by the FLOSS movement mostly linked to (i) collective participation in development of content (ii) updating the content by anyone, (iii) contribution by many authors, (iv) defining learning outcomes (v) creation of support network and developing materials in a collaborative manner (vi) adapting ICT solution by the authors.

The history of Open Educational Resources (OER) goes back to 1994 when Wayne Hodgins has first time used the term “learning objects” in the context of instructional design for developing digital materials. He emphasized the importance of designing and producing the digital materials in such a manner as to be ‘reused’ easily in a variety of pedagogical situations. Subsequent to this, David Wiley in 1998 came out with the concept of “Open Content” basically for professional development of experts in the educational community. This idea became more popular by the internet users. The idea of ‘Open Content’ was based on the basic principles of open/free source of software acquisition movement and was widely applied to open content and the creation of widely adopting open license for content.

Larry Lessing and others in 2001 developed the idea of “Creative Common” and widely circulated a set of flexible licenses to improve the Open Publication License and thereby increasing the credibility and confidence to the Open Content Community. Meanwhile, the Massachusetts Institute of Technology (MIT) in 2001 also announced its “Open Course Ware” initiative to publish nearly every University course for free public access and for non-commercial use. It not only pronounced to encourage taking up such projects at the institutional level but also outsourced such activities leading the MIT brand to the movement.

Subsequently, in 2002 the term “Open Educational Resources” was first adopted at UNESCO’s 2002 World Forum on the Impact of Open Courseware for Higher Education in Developing countries funded by the William and Flora Hewlett Foundation. The forum resolved “Open Educational Resources are defined as “technology–enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes”. OERs are typically made freely available over the web or the internet. Their principal use is by teachers and educational institutions support course development but they can also be used directly by the students. Open Educational Resource includes learning objects such as lecture materials, references and readings, simulations, experiments and demonstrations as well as syllabi, curriculum and teachers’ guides.” (David Wiley, 2007)

3. OER in Indian Context:

The Working Group on Open Access (OA) and Open Educational Resources of National Knowledge Commission (NKC), Govt. of India while discussing through its report on issues related to access to and quality of higher education observes that easy and widespread availability of high quality educational resources that would drastically change the paradigm of teaching for the better and improve the quality of education in institutions. While perceiving the OER in a narrower perspective, it proposes to free and open digital publications of high quality materials organized as
courses that include lectures, related reading materials, snapshots of discussions, assignments, evaluations, etc.

In India, major initiatives for creating open educational resources are mostly in the basic sciences and engineering areas. One of the major programs in India is the National Program on Technology Enhanced Learning (NPTEL) being carried out by seven Indian Institutes of Technologies (IIT’s), the Indian Institute of Science, and other premier institutions around the country and being funded by the Human Resource Ministry. While the NPTEL objective is to enhance the quality of engineering education by developing curriculum-based video and web courses for the students, it also provides an opportunity for teachers and students from rural areas to learn from these high quality lectures and improve the quality of teaching in their classrooms.

The second important open educational resource project is the Ekalavya project launched by IIT, Bombay. In this project, the content is developed in various Indian languages and is distributed through internet. The Ekalavya project has also developed an Open Source Educational Resources Animation Repository (OSCAR) and provides web-based interactive animations for teaching various concepts and technologies. Funding for the Ekalavya and OSCAR project comes mainly from private industry.

E-Grid is the third main Open Educational Resources initiative of India that develops and maintains pedagogically sound and refereed Educational Resources in identified subjects. Subject specific portals are developed and these are managed by subject experts within the program. This project is supported by the Human Resource Ministry through IIIT, Kerala.

In the school education sector, the National Council of Educational Research & Training (NCERT), has placed its new edition of textbooks on its web portal for free download by children and teachers. It has also made accessible its audio & video programmes as a depository on the website and in webcast mode. But it serves only the limited purpose as the text books are mostly meant for the classroom transaction with limited option to promote self-learning.

National Institute of Open Schooling (NIOS), an autonomous organisation under the Ministry of Human Resource Development, Government of India, has brought radical changes largely due to the benevolent use of ICT. The changes are primarily of two types: i) offering on-line educational programmes and ii) using open educational resources (OER) where vast amount of educational material can be made available to learners free of cost. The initiative of NIOS in the context of OER development has been focussed mostly to develop exemplary open courseware which could be made available through Internet and thereby to supplement printed books. OER has the advantage of making learning enjoyable, opens up possibility of accessibility to quality learning materials by all, and subject to continuous upgradation of contents by subject experts. Because of its accessibility by all, it has been envisaged that not only the learners of NIOS could be benefited, but also learners from conventional education sector also would have access to the same without incurring any cost. The NIOS has recently taken up development of OER in three areas of vocational education, viz., (i) Computer and IT, (ii) Tourism and
Hospitality Management, and (iii) Rural Technology. The basic model used for creation of Open Resource is linked to the Role Based Education for Scenario and Situation Based Learning and Situated Development for Social Reconstruction and Transformation.

The Commonwealth Open Schooling Association (COMOSA), a body represented by the open schools in commonwealth countries under the mentorship of Commonwealth of Learning (COL), is committed to develop, adopt/adapt and share learning materials for its distance learners to address the diversified learning needs. It has recently adopted a policy related to OER in its recently concluded General Body meeting held at Seychelles for larger benefit of the ODL system. The first set of OER in school subjects were also launched and dedicated to the learners.

4. Model in developing OER for Vocational Education in NIOS:
With the use of complete ICT applications in networking and global connectedness, the OER becomes independent of any existing delivery modes and can be used suitably in face-to-face, distance or in any mixed or hybrid mode. With the total virtualisation and integration of real life working and living, this becomes a new mode, the trans-mode of education.

Existing curriculum is converted into role and function based blueprint, and each role is specified in terms of functions-processes and expected results. Each process is then described by activities that help in completing the process. Each activity is written with its context or situation and supporting information given for learning, teaching and evaluating. Thus, ultimately the curriculum is changed into role and activities to give results. Each activity needs knowledge, tools, and other resources to complete the activity. The linkages established in the model included Role, Functions and Results (outcome) as highlighted below:

Role → Functions- work processes → Results

Higher Level Roles → Higher functions – processes → Higher Results

The triangular linkages in development of OER are indicated as below:

This triangle maps activities with OER and curriculum; and curriculum could be ‘covered’ by activities leading to Socially Useful Productive Work (SUPW). This paves the way for the learning through activities and the outcome will enrich the learners and society at large. Here in education we may choose situations as class of students, and/ or school and/or surrounding community. This was the intent of Mahatma Gandhi’s Nai Talim to link education with working leading to social development and individual /group livelihood / employment.
The ultimate goal is to develop and deliver quality vocational courses by developing Open Education Resources and delivered to students for playing various roles in the areas of their career choice and for obtaining their livelihood and place in society. The basic aim is to make the vocational education sustainable in ever changing skill development process by creating partnerships with institutions and industries, which need to be absorbed in the framework of National Vocational Education Qualification Framework (NVQEF) of Govt. of India. The process of OER development leads to following outcomes:

I) Creation **Open Education Resources (OER) in the form of role based small modules** at different levels useful for all students at the Secondary School stage (Classes XI to XII), both pre-vocational and vocational education stages.

II) Creation **OER useful for job situations based on role based courses** for Senior Secondary Schools (Classes XI & XII).

III) **Creation and management of Course Teams and Study / Training Center Teams** and organise their services for learners along with their continuous training and upgradation of vocational competencies and capabilities.

IV) **Creation, management and maintenance of learner groups and their associates and communities** of teachers / trainers and learners and practitioners for continuous and sustainable development.

V) Creation of **network of provider institutions**, teacher & trainers, users and agencies involved in the vocational education and employment and form their consortium or alliance for sustainable program development and deployment. NIOS with the support of institutions/organisations strives to achieve the goals in a partnership model.

VI) **Creation of mechanisms for value conversion and wealth creation, quality assurance** and interest based community formation for the management of public-private and community partnerships for the socio-economic development of the locality and local community in the context of globalisation.

5. Development of Open Vocational Education Resources:

For each subject area, Core Group of domain experts and Course Teams have been formed. The steps involved are:

i. Existing providers and user institutions, experts and practitioners are identified and formed into expert/ production and deployment teams / groups, one each for the three selected areas.

ii. Eight top experts in the profession are identified and associated with each team as team leader.

iii. Focussed groups (Area based Teams of about 25 teachers each) for development and deployment are formed along with their leaders.

iv. Community of developers, deployers and users are formed and organised through self-governance.

v. Providers are being formed into partnerships / consortium with suitable MOUs.
6. Empowering Open Schooling:

The entire efforts for developing exemplar OER materials rest with the following principles with the ultimate goals to empower the open schooling movement in the developing nations in the following context:

i. **Access and distribution of learning Resources**: OER helps in bringing collegiality and on-line co-operation among educators who share not only development of learning resources but also helps to increase the quality of learning resources that are available beyond the four walls of the classrooms. Since the learning materials are available at the public domain for use, which otherwise would have remained inaccessible.

ii. **Capacity building**: OER offers not only an opportunity in building the capacity of the individual but also of the institutions through effective networking. For example, the teachers have to search for potentially useful resources based on the most updated knowledge which further enables them to adapt and reuse and thereby significantly helps them to build their own capacity and also they can further contribute for updating the resource materials by providing necessary feedback out of their own experiences.

iii. **Collaborative Efforts**: The principle of OER is basically enhances in collaborating efforts in creating learning resources, more specifically in the context of developing countries. As the whole effort of collaboration is online, the materials can be infinitely customized, availability of appropriate free content license is used. Thus, this enables the developing nations to lead developments and contribute significantly to the knowledge community as active partner. These collaborative efforts facilitate in material development process and helps in empowering educators to demonstrate their potentialities.

iv. **Best Practices**: OER are basically stored in databases or repositories. Since level of documenting the resources are undertaken scientifically, hence there is an ample scope to store the best practices in the form of source form, which usually goes unseen. Even this helps both educators and the organization to demonstrate the practices in their local situation with suitable adaptation, if necessary.

v. **Research**: OER has strong component of research. Any resource material gets developed under the free content principles require to have strong basis of research. Since its primary goal and to create and host free content, multi-media learning materials, resources and curricula for all age groups irrespective of languages, a scientific method of approaching the material development process becomes a component of basic research. Similarly, the effective use of these materials and feedback generated helps in further enhances the quality of resource materials.
7. Conclusion:

Since vocational courses are basically a skill development process, it is being offered through a large number of institutions in the country with similar curriculum. The initiative taken by NIOS to bring the process into the open platform may help the institutions and individual not to replicate the curricular inputs. Under the existing ever changing socio-technological scenarios and work and market situations, the task of vocational education would become much easier process linking education with work. Thus it is a worker’s role based training being given with a set of available input materials, technologies and workshop facilities available at the work places, workshop and training institutions. The integration of work with knowledge, socio-technological situations and value creation requires the processes of training and education not only in realm of vocational education, but it slowly transforms vocational education into ‘higher education’.

8. References:

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Abstract
The teaching of thinking skills has been emphasized in many ways in the Malaysian education system. Although efforts have been done to assist the teachers to teach HOTS, the impact to change students learning is minimal. One of the major reasons identified is the availability of resources based on Malaysian context. A study was conducted on the development of OER to host Bahasa Malaysia, English and History resources designed for Malaysian classrooms. The development of OER aimed to provide these resources to teachers. The study involved six teachers and 92 students of a suburban school in Malaysia. Observations, questionnaires and interviews were used to gauge the teachers’ use and expectations of the OER. The findings presented in this paper focus on the OER as well as the HOTS elements in the OER. Findings suggest that although teachers show positive attitude in using OER, they need to be trained to use OER in a way that suits their respective students.

Keywords: Malaysia, thinking, Bahasa Malaysia, History, English, teaching

Introduction
Thinking skills are emphasized in Malaysian education system through the curriculums (known as the Primary School Standard Curriculum and the Integrated Curriculum of Secondary School). The emphasis on thinking skills prompted the research team to ponder on the availability of resources for teachers to teach HOTS in schools. A review of OER in the Internet found that resources that are suitable to the Malaysian context are barely found. Hence, the idea to develop OER to teach higher order thinking skills (HOTS) integrated in different subjects matter arose. The development of OER involved four stages, namely determining the subjects matter, developing modules, verifying the modules and developing the OER. The paper aims to share some of the expectations and needs of the teachers in using open educational resources to teach thinking skills.
The needs of OER for HOTS
The Ministry of Education introduced the teaching of thinking skills in both primary and secondary schools in 1992. In 1993, teacher training colleges started to introduce the subject in the teacher education curriculum. A few decades after its implementation, teachers are still finding it difficult to infuse thinking skills into content instruction. The basic problem seems to be that the teachers are reluctant to integrate various thinking strategies and skills in their classrooms (Rajendran, 1998). Teachers in Malaysia lack of references and teaching resources that could guide them to integrate HOTS and improve the overall quality of student learning through HOTS.

A review of the free resources based on Malaysian context reveals that Malaysian teachers are active in sharing lesson plans and producing learning materials. Often, these lessons have been conducted and thus are feasible for other teachers to use. These resources are mostly written in the form of blogs, rather than systematic and organized websites or databases. As such, the materials are not centralized. The development of this OER yields opportunity for inspired teachers to share their work in a more organized manner. Some organizations provide teaching and learning materials designed according to the Integrated Curriculum for Secondary Schools (KBSM) for teachers. However, access to these materials is only limited to the subscribers. Not all teachers are able to benefit from these websites.

There is an immense need to innovate how resources are made available to teachers and students currently. As for the starting point, this research aims to develop OER on thinking skills to be used by teachers and others who are interested in acquiring and teaching higher order thinking skills (HOTS).

HOTS in Malaysia
Teaching of HOTS is offered as a subject in the teacher education programmes in both universities and teacher training institutes. HOTS is also integrated into subject matter to enrich the student teachers’ capability to integrate HOTS in teaching and learning, However, a study done by Rajendran (2010) concludes that even though the teaching of thinking skills has been integrated in the pre-service teacher education, student teachers are not able to teach thinking skills effectively. The study also reveals that many teachers are reluctant to teach HOTS to their students because they lack knowledge on HOTS itself.

In-service teachers also show reluctance in integrating HOTS in teaching and learning. Although about 59% of teachers in Malaysia had received some form of training in teaching thinking skills, many were reluctant to incorporate it as part of their instructional strategies (Rajendran, 1998). It is therefore vital to establish continuous professional development in or out of the school to develop teachers’ knowledge, skills, and confidence in integrating HOTS.

In-service teachers often cite lack of materials as one of the main challenges that lead them not to infuse HOTS in their lessons (RahilMahyuddinet al., 2004). Materials on HOTS are widely available in the Internet, but only a handful is appropriate to the
Malaysian context. Materials obtained from the Internet need to be modified substantially before they could be used in the Malaysian classrooms. This again brings more responsibilities to teachers.

Creating modules of the OER
The research team chose Bahasa Malaysia, English and History as the first three subjects to develop OER. As this was the first phase of the research which was conducted in 12 months, only three subjects were chosen. The teaching and learning of these subjects would need localised materials. This was vital to the integration of HOTS in the subject matter. The expertise available in the research team was also taken into account in choosing the subjects matter.

The next step involved the development of the modules. This stage began with determining the format of the module. The initial format was based on the lesson plans suggested by Rajendran (2010). The format was improvised from time to time. The final format included all the necessary details needed by the teachers in order to execute the lessons. The modules were also developed in a flexible way in which teachers were free to adapt the modules to suit their students.

The next step involved verification of the modules. The modules were used in a school involving six teachers. For each subject, two teachers tried out the modules. The teachers provided feedback on various aspects after they had completed all the modules. These aspects included preparation of the lessons, implementation of the lessons, integration of HOTS, students’ participation, learning activities and suggestions to improve the modules. Apart from teachers, students were also given a chance to express their feelings on classroom learning when their teachers were using the modules.

Creating the website
The final step of developing the OER involved designing the OER website and uploading the OER for public viewing. After conducting a survey of the available hosts, the research team decided to host the OER website using SIEU’s server. The content management system used by SIEU was Joomla version 1.7. Technical assistance was sought from the ICT Department to develop and upload the frame of OER website. The research team then decided the theme, layout and content of the website. Finally, the modules were uploaded. The OER website required maintenance from time to time. The research team held the responsibility to maintain and monitor the use of the website.

Upon deciding to host the OER using SIEU’s server, the research team faced some technical issues in developing the OER. Firstly, the research team had to abide the rules and policy practiced by SIEU throughout the period of developing the OER and also after launching the OER. The site could only be accessed from 8am until 5pm. Restricted access before the OER was launched slowed down the development of the OER. Secondly, the research team had minimal knowledge about Joomla 1.7. The ICT Department provided basic training on operating Joomla to the research team. The
The research team also received information through webinar, forum discussions and online workshops related to Joomla.

**Data Collection**
This study involved 6 teachers and 92 students of a suburban secondary school in Perak, Malaysia. The teachers were teaching Bahasa Malaysia, English and History. The students of the teachers also participated in the study.

The study involved observations, questionnaire and semi-structured interviews. Observations on classroom teaching and learning were conducted to yield information on questioning, technology and instructional activities. The research team observed 16 teaching and learning sessions.

Two sets of questionnaire were prepared. The teachers answered the first set of questionnaire which focused on teacher preparation, lesson implementation and classroom management. The second set of questionnaire which focused on lesson implementation and classroom management was answered by the students.

Similarly, two semi-structured interviews were conducted at the end of the study. The teachers were interviewed individually to obtain information on their understanding of HOTS, importance of teaching HOTS, and experience in carrying out the modules. Focused group interviews with five or six students of each participating class were also conducted. The interviews focused on the learning activities, encouragement in asking questions during the lessons, and the opportunities for exploring new ideas, making decisions and proposing solutions in the classroom.

**Teachers’ expectations and use of OER**
The findings discuss the teachers’ expectation and use of OER in two parts. The first part addresses specifically on the implementation of the OER. The teachers showed interests in using the OER. The teachers expected that OER would be able to arouse the students’ interest in learning the subject through integration of HOTS. They commended that the students’ interest was aroused through the use of a variety of activities including chess, crossword, and jigsaw puzzle. Students had more opportunities to talk during the lessons.

However, the teachers also showed very minimal knowledge on ways to use OER. This brought some implications to the use of the OER. Firstly, the teachers followed the modules strictly, without making necessary amendments to suit their teaching styles. This caused them to feel burdened by the activities that had to be carried out as suggested by the module. Secondly, the teachers faced problems in achieving the learning outcomes. Although lessons could be prepared according to the modules, not all learning outcomes could be achieved because not all students were able to follow the lessons. Apart from that, external factors such as the school environment and classroom condition also affected the teaching and learning process. Thirdly, the teachers also faced time constraint in delivering the lesson. The teachers could not
complete the lessons when there were activities involving grouping, discussion, and presentation.

The second part of the findings addressed the HOTS elements of the OER. The teachers felt that the HOTS element in the modules could be improved. Two teachers felt that more HOTS elements need to be included in the modules. They commented that the HOTS elements in the modules were easy and straightforward, thus were not challenging for the students to achieve. One teacher showed satisfaction with the integration of the HOTS elements in the modules. She stated that the modules were aligned with the syllabus and infused with positive values. The modules allowed the students to think, analyse, compare, and differentiate. The students also expressed satisfaction on learning HOTS in the lessons. The HOTS lessons enabled them to be disciplined and be brave in giving ideas and presenting their work.

**Sustainability of the OER**
The sustainability of the OER is ensured in two ways. Teachers from other secondary schools in the Batang Padang district are invited to use the OER. Firstly, teachers from the schools are invited to contribute their lesson plans to the OER. The lesson plans could be remixed from the original lesson plans uploaded in the OER website. The research team also encourages teachers to record and submit videos and photos depicting best practices of teaching HOTS in Malaysian classrooms. The lesson plans, videos or photos will be reviewed by the research team to ensure that the materials are related to integrating HOTS into subject matter and that no copyright infringement will be caused by publishing the materials.

Secondly, the use of OER will be incorporated in teaching and learning in SIEU. The project will be introduced to lecturers and students of the teacher education university. Lecturers and students are welcomed to use and contribute new materials to the OER. Lecturers could also share their knowledge on Creative Commons through this OER.

**Conclusion**
Teachers need continuous support in the forms of ideas and resources to sustain the integration of HOTS in teaching and learning. The HOTS OER provides a platform which the teachers could use, reuse, remix and contribute their knowledge and materials. This initiative is of utmost importance as these resources are based on the Malaysian context. The use of OER will bring benefits especially to teachers from remote areas where access to printed materials is scarce. The second phase of this study will involve other core subjects taught in the schools. It is also hoped that more teachers and schools will be involved in re-creating or contributing resources to the OER.

**Acknowledgement**
This research was supported by Sultan Idris Education University (2010-0082-106-01). We also wish to thank our research assistant, Miss Amreet Kaur.
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EVALUATION OF LEARNING OBJECTS

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Abstract

Open educational resources are digital materials that can be re-used for teaching, learning, research and more, made available free through open licenses, which allow uses of the materials that would not be easily permitted under copyright alone. This material is available in different formats. Different forms of OER have different characteristics and uses. Learning objects is one of the important form of OER. The need to take classroom-based instruction, materials, and information to create a low-cost, high quality instruction in a web-based format has given way to the concept of Learning Objects (LOs). A learning object repository provides faculty, teachers, curriculum developers and students with easy access to a large storehouse of content/learning objects that can be shared and used within and across schools, colleges and universities, and state agencies.

In the repositories the learning objects are stored according to their disciplines with metadata as title description, type, author, creation date, updated date, technical requirements, copyright information and keywords for search. To select appropriate learning object for students it is essential to evaluate the quality of learning objects. In the present study an attempt has been made to determine quality of available Learning Objects.

Keywords: Learning objects, quality, evaluation rubric
Learning Objects:

Learning object is a digital learning material. It is one of the important form of OER. It aims to enable a learner to acquire knowledge and skills on a specific topic or theme. A learning object is a collection of content items, practice items, and assessment items. All these items are combined and based on a single learning objective. Learning objects are a new way of thinking about learning content. Instead of providing all the material for an entire course or lecture, a learning object provides material in short chunks, for a short period of time. This time ranges from 5 to 15 minutes. Once the learning object is developed it can be reused several times by teachers and learners.

Definitions of learning object:

Learning object is defined as, any digital recourses that can be reused to support learning. The term learning objects generally applies to educational materials designed and created in small chunks for the purposes of maximizing the number of learning situations in which the resource can be utilized. (Willy, 2000)

The following are the Learning Object’s structural components:

- Objective: A statement describing the intended criterion-based result of an instructional activity.
- Learning Activity: an element of the instruction that teaches to an objective.
- Assessment: an element that determines if an objective has been met.

Learning objects are used to teach particular skill or concept, or to provide stimulating thinking and learning experience for the learner. For teaching and learning purposes, effective learning objects use documents, interactivity, graphics, sound, animation, simulation, video and other multimedia tool that go beyond static text book. These feature of learning objects provide learners engaging real world learning experience.

Key characteristic of learning object:

- Accessibility
- Reusability
- Interoperability
- Granularity
- Tagged with metadata

Learning object repository:

The term “repository” is often used to refer to a content storage system for learning objects. A learning object repository provides faculty, teachers, curriculum developers and students with easy access to a large storehouse of
content/ learning objects that can be shared and used within and across schools, colleges and universities, and state agencies.

In the repositories the learning objects are stored according to their disciplines with metadata as title description, type, author, creation date, updated date, technical requirements, copyright information and keywords for search. To select appropriate learning object for students it is essential to evaluate the quality of learning objects.

**Previous approaches to evaluating learning objects:**

Nesbit, Belfer, Vargo (2002) developed 'A Convergent Participation Model for Evaluation of Learning Objects'. In this model representatives from stakeholder groups (e.g., students, instructors, subject matter experts, instructional designers, and media developers) converge toward more similar descriptions and ratings through a two-stage process supported by online collaboration tools. The article reviews evaluation models that have been applied to educational software and media, considers models for gathering and meta-evaluating individual user reviews that have recently emerged on the Web, and describes the peer review model adopted for the MERLOT repository. The convergent participation model is assessed in relation to other models and with respect to its support for eight goals of learning object evaluation: (1) aid for searching and selecting, (2) guidance for use, (3) formative evaluation, (4) influence on design practices, (5) professional development and student learning, (6) community building, (7) social recognition, and (8) economic exchange.

Vargas, Ortega (2006) proposed framework for Learning Object Evaluation (FLOE). In this model quality of learning object is studied through four aspects: positive quality, negative quality, delivery, and formative quality.

Leacock, T. L., & Nesbit, J. C. (2007) has given A Framework for Evaluating the Quality of Multimedia Learning Resources. This article presents the structure and theoretical foundations of the Learning Object Review Instrument (LORI), an evaluation aid. A primary goal of LORI is to balance assessment validity with efficiency of the evaluation process. The instrument enables learning object users to create reviews consisting of ratings and comments on nine dimensions of quality: content quality, learning goal alignment, feedback and adaptation, motivation, presentation design, interaction usability, accessibility, reusability, and standards compliance.

Kay and Knaack (2008) proposed ‘A multi-component model for assessing learning objects: The learning object evaluation metric (LOEM)’. The purpose of the study was to develop and assess a multi-component model for evaluating learning objects. The Learning Object Evaluation Metric (LOEM) was developed from a detailed list of criteria gathered from a comprehensive review of the literature. A sample of 1113 middle and secondary students, 33 teachers, and 44 learning objects was used to test this model. A principal components analysis
revealed four distinct constructs: interactivity, design, engagement, and usability. These four constructs showed acceptable internal and inter-rater reliability. They also correlated significantly with student and teacher perceptions of learning, quality, and engagement. Finally, all four constructs were significantly and positively correlated with student learning performance. It is reasonable to conclude that the LOEM is reliable, valid, and effective approach to evaluating the effectiveness of learning objects in middle and secondary schools.

In summary, it can be said that existing models of learning object evaluation include a relatively comprehensive set of evaluation criteria, but the quality of individual elements is not taken into consideration. This can be done by using evaluation rubric.

**Evaluation Rubric:**

A rubric is a scoring tool and it is a set of criteria and standards linked to learning objectives that is used to assess a student’s performance on papers, projects, essays, and other assignments. Rubrics allow for standardized evaluation according to specified criteria, making grading simpler and more transparent.

Heidi Goodrich Andrade (1997), a rubric’s expert, defines a rubric as “a scoring tool that lists the criteria for a piece of work or ‘what counts.’” Rubric also describes levels of quality for each of the criteria. These levels of performance may be written as different ratings (e.g., Excellent, Good, Needs Improvement) or as numerical scores (e.g., 4, 3, 2, 1). Rubrics are performance-based assessments that evaluate student performance on any given task or set of tasks that ultimately leads to a final product, or learning outcome. Rubrics use specific criteria as a basis for evaluating or assessing student performances as indicated in narrative descriptions that are separated into levels of possible performance related to a given task. Starting with the highest level and progressing to the lowest, these levels of performance are used to assess the defined set of tasks as they relate to a final product or behavior. Each level describes degrees of proficiency and each level is assigned a value that rates the degree of proficiency or student performance.

Rubric has a detailed and precise criteria and rating scale involves qualitative description of a limited number of aspects of a things that may help researcher/teacher in analyzing learning object. Hence researcher has adopted a rubric for evaluation of Learning Object.

**Educational Significance of the Study:**

Evaluation of learning object can lead to improve quality of learning object. The developed tool in form of rubric will be helpful to teachers who wish to use the
learning objects. Learning object is self learning material hence, to select a complete learning object which, fulfill the students’ need; rubric can be used. Teachers can use rubrics for selecting any learning object from the web. Teachers will know that, they are using learning object which, adds value to the learning. Hence, this rubric will ease the selection process and will also provide guidelines for developers to create an effective learning object. The learning objects can be selected by determining its quality.

**Sample of the study:**

Learning objects are the samples of this study. Learning objects were selected from following learning repositories they are wisc- online, learning about learning object, LORDEC and CIET. All the learning objects are available online. The sampling technique used was purposive sampling.

The sample size for this study was 8 learning objects. These learning objects were from different subjects. Those were Mathematics, science, English and Geography. Details of the learning objects (sample) are attached in annexure A.

**Tool for data collection:**

This tool was prepared considering all the points which contribute in the creation of learning objects which in turn helped in gauging the quality of the learning objects. 

**Preparation of the tool:**

The researcher has prepared a rubric for evaluating learning objects. This will help to understand the loop holes and quality of the learning objects. Many repositories of learning object were explored by the researcher. All the features of the learning objects were noted down by the researcher.

**Learning objectives:**

Learning objectives must be clearly written. Learning objectives should reflect a measurable outcome. They must be achievable. They should be learner specific. The learning activities, content and assessments provided by the object should align with the declared learning objectives.

**Content quality:**

The content should be free of error and presented without bias or omissions that could mislead learners. It must be logically sequenced and presented in small chunks. It should be presented at appropriate level of detail and emphasize on key points and significant ideas.
Language:

To understand the concept it is essential to have correct and simple language. Slang language should be avoided. Language should be simple and appropriate for the target group as well as it should be free from grammatical error.

Design:

Color and text are element of the design. Contrast color of the background and text should make text readable. Font size and style should appropriate so that, it will help learner to read easily. Text need to well organized with headings and subheadings. Along with this text and images need to be well placed and size of images, text should be appropriate to each other.

Graphics:

All the graphics should be relevant to the content and explain the difficult concepts with clarity. For better understanding all the graphics in learning object needs to be clear and should good and appropriately used in learning object. Graphics should play important role in education and betterment of learning.

Interactivity:

Interactivity can be defined as a function of the technology, in terms of the control made available to the user, as an expression of quantity or by assessing the quality of learning. This is the type of Learner to Computer (Software/Interface) where learner should interact clicking on the object, dragging and dropping the object. Also interaction should increase motivation and interest. It should give opportunities for learners to express their own points of view to explain the issues in their own words and formulate opposing or different arguments; also it should have been related to deep-level learning and the development of critical thinking.

Navigation:

All buttons and links should activate on every screen. Navigation should provide ease of moving through learning object and non linear navigation.

Questions:

Assessment is important component of learning object. For this questions are asked which need to be relevant and appropriate for target group. Also the clarity of instructions play very important role in determining the quality of questions asked in learning objects.
Feedback:

The feedback to the test items should be immediately provided after answering the test item. It should be provided with rationale. The feedback should be effective and appropriate.

Animation:

Animations can use to enhance and support learning. Animations are mainly used for process and procedure. They should be appropriately used with the content. The length and speed of the animation should be appropriate.

Sound:

Sound provided in the learning should be suitable and appropriate for the target group. User should be able to control the sound.

After deciding the criteria description for different level of each criterion was written.

Validation of tools:

The tool was sent for validation to experts. According to experts' comments changes were made in the rubric. Developed tool was then used for evaluating following learning objects. The copy of evaluation rubric is given in annexure B.

Learning Object 1: Triangle
Learning Object 2: Algebra- algebraic identities
Learning Object 3: Gas exchange
Learning Object 4: Refraction of Light
Learning Object 5: Modifiers Noun
Learning Object 6: Personal pronouns
Learning Object 7: Types of rainfall
Learning Object 8: Square root practice

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<td>Question (out of 9)</td>
<td>0</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Feedback (out of 6)</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Interactivity (out of 6)</td>
<td>4.5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sound (out of 3)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Overall impression/rate (out of 3)</td>
<td>3</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total (out of 90)</td>
<td>66.5</td>
<td>83.5</td>
<td>63</td>
<td>58</td>
<td>68</td>
<td>67</td>
<td>63</td>
<td>58</td>
</tr>
</tbody>
</table>

From the above table presence of element in the learning object can be seen as follows:

- Except one, all learning objects lack in fulfilling the criteria related to learning objectives.
- In all learning objects content presented is error free, logically sequenced and in small chunks.
- The language used in all almost all the learning objects is simple and appropriate for the target group and free from grammatical error.
- Except one, in all the learning objects background color and text color are complementary. Hence, text is readable. The font style, color and size are appropriate for reading.
- In 50% learning objects all the graphics used are relevant to the content and explain the difficult concepts with clarity.
- All the learning objects show high level of interactivity.
- In all the learning objects all buttons and links are activated and navigation is easy.
- Except one all the learning objects have provision for immediate and appropriate feedback.
- Only 2 learning objects have good quality animations
- Except one in all the learning objects the questions asked are relevant, clear and appropriate for target group.
- Only 2 learning objects have sound which is appropriate and can be controlled by the learner.
To rate the learning objects in terms of quality, researcher has developed a scale as follows:
1-15 ------------ Poor
16-30 ------------ unsatisfactory
37-45 ------------ Satisfactory
46-60 ------------ Good
61-75 ------------ Very good
76-90 ------------ Excellent

Table 2
Quality-wise Distribution of LOs

<table>
<thead>
<tr>
<th>Range of score</th>
<th>Quality</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15</td>
<td>Poor</td>
<td>0</td>
</tr>
<tr>
<td>16-30</td>
<td>unsatisfactory</td>
<td>0</td>
</tr>
<tr>
<td>37-45</td>
<td>Satisfactory</td>
<td>0</td>
</tr>
<tr>
<td>46-60</td>
<td>Good</td>
<td>25</td>
</tr>
<tr>
<td>61-75</td>
<td>Very good</td>
<td>62.5</td>
</tr>
<tr>
<td>76-90</td>
<td>Excellent</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Above table shows that all learning objects are of good quality and hence can be recommended to learners.

**Conclusion:** From the above description it can be said that selected open educational resources in the form of learning object available on World Wide Web are of good quality. Teachers can use developed evaluation rubric to judge the quality and accordingly select for his/her students.
References:


Annexure A

URLs of selected learning objects

http://www.ciet.nic.in/learning_object_maths/Triangle%20English.html
http://www.ciet.nic.in/learning_object_maths/Algebra%20English.html
http://education.uoit.ca/lordec/ID_LORDEC/gas_exchange/index.html
http://education.uoit.ca/lordec/ID_LORDEC/refraction_light/index.html
http://staff.argyll.epsb.ca/jreed/math9/strand1/square_root.swf

Annexure B

Evaluation rubric

For given statement like 'all, some, and very few' approximately percentage has considered while evaluating the learning object. They are given below:
50 to 100%      - all
25 to 50 %      - some
Less than 25%  - very few

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Excellent</th>
<th>Average</th>
<th>Poor</th>
<th>marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning Objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relevance</td>
<td>All the objectives are relevant to the content.</td>
<td>Some of the objectives are relevant to the content.</td>
<td>Very few objectives are relevant to the content. Or objectives are not given.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>specificity</td>
<td>All the objectives from learning object</td>
<td>Some of the objectives from learning object</td>
<td>Very few objectives from learning object</td>
<td></td>
</tr>
<tr>
<td>Attainability</td>
<td>Measurable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All the objectives are attainable for the target group.</td>
<td>Some of the objectives are attainable for the target group.</td>
<td>Very few objectives are attainable for the target group.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**2 Content**

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Scope of the content</th>
<th>Sequencing</th>
<th>Learning time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content in the learning object is without any conceptual error.</td>
<td>Content is appropriate for 1 learning object and for the target group. Also content is appropriate and sufficient to achieve the learning objectives</td>
<td>Throughout the learning object maxims of learning are used. Like content is sequenced from known to unknown and simple to complex.</td>
<td>Learning time of the learning</td>
</tr>
<tr>
<td>Content in the learning object contain few conceptual errors.</td>
<td>Appropriate content is used for the target group but there is a chance to increase scope of the content.</td>
<td>Some of the screens have content which is sequenced from known to unknown and simple to complex.</td>
<td>Learning time of the learning</td>
</tr>
<tr>
<td>Content in the learning object has many conceptual errors.</td>
<td>Scope of the content is vast for 1 learning object; more than 1 learning object can be designed.</td>
<td>Very few screens have content which is sequenced from known to unknown and simple to complex.</td>
<td>Learning time of the learning</td>
</tr>
<tr>
<td></td>
<td>object is around 15 to 20 min.</td>
<td>object is exceeds up to 20 to 45 min.</td>
<td>object is exceeds more than 45 min.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>3 Language</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammatical correctness</td>
<td>The text is grammatically correct throughout the learning object.</td>
<td>Throughout the learning object 1-4 grammatical errors are there.</td>
<td>Throughout the learning object there are 5 or more grammatical errors.</td>
</tr>
<tr>
<td>Appropriateness</td>
<td>Throughout the learning object language is simple and appropriate for the target group.</td>
<td>Throughout the learning object language is appropriate for the target group, but it could have been simpler for the target group.</td>
<td>Throughout the learning object language is very difficult for the target group.</td>
</tr>
<tr>
<td><strong>4 Design</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>In all the screens- 1. The text color is in contrast with the background color. 2. Color combinations / themes are appealing and appropriate for the target audience. 3. Color combinations / themes are consistent</td>
<td>In some of the screens- 1. The text color is in contrast with the background color. 2. Color combinations / themes are appealing and appropriate for the target audience. 3. Color combinations / themes are consistent</td>
<td>In none or very few screens, 1. The text color is in contrast with the background color. 2. Color combinations / themes are appealing and appropriate for the target audience. 3. Color combinations / themes are inconsistent</td>
</tr>
<tr>
<td>Text</td>
<td>Font size and style is consistent throughout the learning</td>
<td>Font size and style is consistent throughout the learning</td>
<td>No consistency in font size and style throughout the learning</td>
</tr>
<tr>
<td>5 Graphics</td>
<td>6 Animation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relevance</strong></td>
<td>All the graphics are relevant to the content and explain the difficult concepts with clarity.</td>
<td>All the animations used in the learning object are meaningful and relevant to the content and explain the difficult concepts with clarity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some of the graphics are relevant to the content and explain the difficult concepts with clarity.</td>
<td>Some of the animations are relevant to the content and explain the difficult concepts with clarity.</td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td>All the graphics are clear. Images are good and appropriately used.</td>
<td>All the animations used in the learning object are meaningful and relevant to the content and explain the difficult concepts with clarity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some of the graphics are clear. Images are good and appropriately used.</td>
<td>Some of the animations are relevant to the content and explain the difficult concepts with clarity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very few graphics are clear. Images are good and appropriately used.</td>
<td>Very few animations are relevant to the content and explain the difficult concepts with clarity.</td>
<td></td>
</tr>
</tbody>
</table>

**Accuracy**

<table>
<thead>
<tr>
<th>Animation used</th>
<th>Animation is</th>
<th>Animation is not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning object. Appropriate size is used for heading and subheadings. Color of the font is pleasing to the eye.</td>
<td>Learning object. Text is somewhat appropriate and color of the text is not readable.</td>
<td>Learning object. More emphasis is given to the background and not to the text.</td>
</tr>
<tr>
<td>Text is somewhat appropriate and color of the text is not readable.</td>
<td>Some of the screens have well organized text with headings and subheadings. Overall screen is not neatly organized.</td>
<td>Very few screens have well organized text with headings and subheadings. Screen is neatly organized.</td>
</tr>
<tr>
<td>Very few screens have well organized text with headings and subheadings. Screen is neatly organized.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accurate</td>
<td>Much accurate</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>in the learning object</td>
<td>accurate according to</td>
<td>much accurate according to</td>
</tr>
<tr>
<td></td>
<td>the topic and objects</td>
<td>the topic. Also objects are</td>
</tr>
<tr>
<td></td>
<td>are labeled but they</td>
<td>not labeled.</td>
</tr>
<tr>
<td></td>
<td>are not much simple for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the target group.</td>
<td></td>
</tr>
<tr>
<td>in the animation</td>
<td>labeled.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>objects are labeled.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Zooming                 | All animations allow    | Very few animations         |
|                         | user to zoom wherever   | allow user to zoom wherever |
|                         | required.               | required.                   |
|                         | Some of the animations  |                             |
|                         | allow user to zoom      |                             |
|                         | wherever required.       |                             |

| Speed                   | Speed of the animation  | Less than 25% animations    |
|                         | is according to the     | are according to the        |
|                         | target group. Speed is  | target group and speed is   |
|                         | appropriate.            | appropriate.                |
|                         | 25 to 50% animations    |                             |
|                         | are according to the     |                             |
|                         | target group and speed   |                             |
|                         | is appropriate.          |                             |

| Repetitive              | Replay button is        | Replay button is provided   |
|                         | provided for all         | for very few animations,    |
|                         | animations, which are    | which are used for          |
|                         | used for explaining      | explaining concept.         |
|                         | concept. Or Reply button |                             |
|                         | is not required, hence   | is not required, but it is  |
|                         | it is not provided       | not provided for some of    |
|                         |                           | the animation.              |

| Navigation              | All the links are        | Very links are labeled      |
|                         | labeled and connected to | and connected to the right  |
|                         | the right place. Learning| place.                      |
|                         | object is very easy to   |                             |
|                         | navigate.                |                             |

| Hyperlink               | Some of the links        | Very few screens have       |
|                         | are labeled and connected| instructions for navigation |
|                         | to the right place.       | in the form of text or      |
|                         | Learning object is very   | highlighting the object or   |
|                         | easy to navigate.         | using                       |

<p>| Instructions for        | Some of the screens have | Very few screens have       |
| navigation.            | instructions for          | instructions for navigation |
|                         | navigation in the form of| in the form of text or      |
|                         | text or highlighting the  | highlighting the             |
|                         | object or using           |                             |</p>
<table>
<thead>
<tr>
<th>8</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relevance</strong></td>
<td>All the questions are relevant to the concept and learning objectives.</td>
</tr>
<tr>
<td><strong>Clarity of instructions</strong></td>
<td>For all the questions; clear instructions are given in a simple language.</td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td>Level of all the questions in the learning object are appropriate to the target group. Also They match with learning objectives.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>All the questions have immediate feedback for every attempt.</td>
</tr>
<tr>
<td><strong>Means of giving feedback</strong></td>
<td>Sound and / or, graphics and / or text are used for giving feedback.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10</th>
<th>Interactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Levels of Viewer interacts</strong></td>
<td>Viewer interacts</td>
</tr>
<tr>
<td>Interaction</td>
<td>by clicking on the object, dragging and dropping the object and putting the text on screen.</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Simplicity of instructions for interactivity.</td>
<td>Instructions used for activity are short, clear and complete. Instructions are simple for the target group.</td>
</tr>
</tbody>
</table>

| Sound Appropriateness | Sound provided in the learning object is suitable and appropriate for the target group. Sound is clear and can be controlled by the user. i.e. volume control, mute. | Sound provided in the learning object is appropriate and pleasant, but it does not have any feature to be controlled by the user. i.e. volume control, mute. | Sound provided in the learning object is not appropriate. Or Sound is not provided in the learning object. |

<table>
<thead>
<tr>
<th>Overall Impression / rating</th>
<th>Excellent</th>
<th>Average</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall presentation of the learning object.</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Total--------/90
Abstract
This paper traces the recent development of open educational resources. The Massachusetts Institute of Technology began development of open courseware (OCW) in 2002 as a means ‘to advance knowledge and educate students’. The movement to develop OER has since gained momentum as educators have come to realize the potential of OER in enhancing delivery of education. Virtual universities offering online courses using OER have mushroomed recently, granting certifications after assessment, at a low fee. From among the various forms of OER, teachers and education planners have found that open textbooks are a particularly useful form of content delivery, and may serve as a solution to the problem of high textbook prices. This has led to the growth of many open textbooks projects.

Against this background, this paper examines the issues and problems related to textbooks in Hong Kong. It outlines an open textbook initiative which is meant not only to solve Hong Kong’s immediate problem of high textbook prices, but also ultimately to achieve effective teaching and learning in the digital era. The various components of the open textbook project, which are designed to address the needs of Hong Kong schools and universities, will be introduced.

Keywords
Open educational resources; open textbooks, open license

Outgrowths of OER

OER Universities

With the abundance of open courseware attracting a high number of learners, a low-cost online education industry is starting to grow. Coursera (https://www.coursera.org/#) and Udacity (http://www.udacity.com/) are recent for-profit ventures, offering online courses based on open courseware. In late 2011, MIT formed MITx (http://mitx.mit.edu/), and in the fall of this year it will launch edX in partnership with Harvard University and UC Berkeley. Both MITx and edX are non-profit projects which offer university-level courses online to a global audience at no charge, by making use of the open courseware these institutions have developed. For a modest fee, anybody, including MIT or Harvard students, can earn certificates for successful completion of the courses, although still no college credit is awarded.
In addition to educational offerings, the participating institutions will use edX to research learning and distance education. Furthermore, the ‘learning platform’ for delivery of the courses will be developed as open source software and made available to other institutions of higher learning which wish to make similar offerings; there are also plans to allow other schools to offer courses on the edX website (https://www.edx.org/faq). A viable business model for the sustainability of edX is currently being worked out.

**Open Textbooks**

While online open courses cater to the general public, some other open source learning resources have been deliberately developed for specific groups of users. These are ‘open textbooks’, and they are increasingly seen as a viable solution to an existing problem in education: the high prices of textbooks.

Open textbooks are able to provide a total solution to the problems listed above. They:
- are inexpensive to users (students, teachers and parents);
- allow rapid revision and timely updates;
- allow transparent peer and readers’ control of quality;
- allow easy adaptation and school/class-based modifications;
- are digitized for online or mobile learning;
- are readily available for use along with other multi-media, online materials, whether in print or in other digital formats.

These advantages of open textbooks have been evident in the broad range of experiences of overseas institutions.

**Problems related to textbooks in Hong Kong**

Over the past decade, Hong Kong has been continually confronted with a number of issues related to textbooks, especially the issue of high textbooks prices at the primary and secondary school levels. There are also additional issues which have stalled the development of e-learning at the school level.

- Printed textbook prices have stayed inextricably high in the eyes of students and parents.
- Traditional printed textbooks are not flexible enough to cater for the specific needs of students of individual schools or classes.
- Hong Kong textbooks that are intended to be placed in the Recommended Textbook List of the Education Bureau (EDB) of the government are required to pass an EDB instituted vetting (assessment) process. However, the vetting requirements and the curriculum changes have exerted extra pressure on publishers in meeting deadlines and standards, and extra efforts and resources are needed by publishers to satisfy such needs.
- Textbooks in Hong Kong are still published using the conventional model of heavy upfront investments, highly specialized expert development teams and lengthy production procedures and schedules.
- Some academic staff in universities and teachers in secondary schools have attempted to develop their own teaching and learning materials for students, but they are mostly ‘lone rangers’ and the scale of their production remains small.
Hence, their efforts are not shared by other colleagues even though they may wish to do so.

- Publishers are reluctant to take much advantage of digital technology and put textbooks online en masse. Therefore students are deprived of the options of online access and mobile learning, which are important elements of teaching and learning today.

The Hong Kong government’s solution to textbook problems

In recent years, the Hong Kong government has been promoting the use of e-books and e-resources rather than printed copies. It has taken e-textbooks to be a solution to the problem of constant and rapid rises in the prices of printed textbooks.

A government working group on textbooks and e-learning resources development has recommended measures to assist the development of open e-learning resources (Working Group on Textbooks and E-learning Resources Development, 2009), and these include:

1. Grants should be provided to encourage collaboration between schools and other sectors in developing and promoting the e-learning resources market, and for purchasing e-learning resources.
2. The Hong Kong Education City (HKEdCity), a government portal for the promotion of the use of information technology in education, would set up an e-commerce platform of e-learning resources to assist students and teachers in purchasing such resources from various providers, as well as to facilitate the sharing of free learning resources designed by teachers.
3. Textbooks, teaching materials and learning materials should be debundled for pricing as soon as possible, a move which is intended to reduce textbook prices.

None of these measures halted the increase in textbook prices. The issue of high textbook prices continued to be a hot topic for the media for 2011 and the first few months of 2012. A Task Force to review learning and teaching materials produced yet another report on the subject in December 2011. One important recommendation of the report was ‘to provide incentives and assistance to attract new entrants such as relevant organizations and professionals to the market so as to develop quality and reasonably-priced e-textbooks’. An ‘e-Textbook Market Development Scheme’, or EMADS, in June 2012, which aims to ‘facilitate and encourage the participation of potential and aspiring e-textbook developers for the development of a new, healthy, rich and sustainable e-textbook market in Hong Kong’. The plan encourages and actually subsidizes the development of e-textbooks by non-profit making organizations. It is hoped that the move will help promote better learning and teaching in the long term.

Were printed textbook prices reduced when some parts of printed textbooks were replaced by e-learning resources? No textbook price reduction had been observed in the past years, when the HKEdCity offered plenty of e-resources. We are of the view that e-learning resources can supplement printed textbooks in teaching, but they will not completely take the place of them for a long time to come. Judy Baker of the Community College Consortium of Open Educational Resources likens printed textbooks to ‘The Hummer of higher education’ (quoted by Kamenetz, 2010), and this analogy applies equally well to primary and secondary schools in Hong Kong. Even
when parts of printed textbooks are replaced by e-resources, parents still have to purchase the whole set of textbooks as they cannot be purchased in parts. So while the use of e-learning resources in the classroom is on the rise, and the government’s move to promote and invest in e-learning in schools is widely applauded, it has not helped to reduce the high textbook expenditure by parents in Hong Kong.

Will printed textbook prices be reduced because of the EMADS? This is yet to be seen. Since the scheme provides subsidy to non-profit making organizations to produce e-textbooks, the cost of the production can be lowered, so long as the subsidy is still at work. However, there is no guarantee that the cost of e-textbooks will remain low when the subsidy runs out.

There are other costs involved when using e-textbooks. E-books are not like printed books which can be read directly. To read from an e-book, there is a need to have in place the appropriate infrastructure and equipment (including an Internet connection to download the book, individualized access devices, not to mention the server and learning management systems hosting the books) and these will all involve substantial costs.

There is one more hurdle in the government’s EMADS scheme – it aims to promote the development of enhanced e-textbooks, and not the more common e-textbooks. The difference between these two versions of e-textbooks is that the former contains enhanced features that only the most up-to-date technology can deliver. These are multimedia instructional contents which are very costly to develop. Common e-textbooks, in contrast, are plain and do not provide rich multimedia content like the enhanced ones. They may bring about a 70% or 80% cost reduction over the traditional printed textbooks.

**Our solution for the problems in Hong Kong**

By taking advantage of information and communication technologies, and new developments in copyright licensing, solutions are emerging to address a combination of issues involving costs, intellectual property rights, access and utilization. This is the open textbooks model.

A group of interested colleagues at the OUHK have come to the conclusion that they can take advantage of new developments in information and communication technologies, and copyright licensing. They note that there are now a vast number of open education resources or free learning resources for higher education worldwide and these innovations are also diffusing to the primary and secondary education levels, notably in North America and Europe.

More specifically, beneficiaries of this proposed project will include students, teachers, parents, and the community.

**The open textbook system**

The OUHK has proposed the establishment of a sustainable system which provides quality open textbooks for adoption and adaptation at minimal cost for education for
all. The proposal has been approved for funding. This system will serve students and teachers at the primary, secondary and tertiary levels.

The proposal was developed based on the concept and practice of open textbooks. The goal is to develop an Open Textbook system that can establish an online collaborative environment to produce open source textbooks which are free, flexible, current and directly available for use and adaptation by universities and schools.

The deliverables of the project include:

a) An online open textbook platform  
b) Online textbooks and teaching materials  
c) Quality assurance  
d) Community and capacity building

These will be described in more detail below.

A. An online open textbook platform

A platform will be developed to serve a number of functions. First, it will provide a repository for hosting textbook contents, courseware, teaching materials and resources (such as links to online contents which are available overseas). Teachers can select appropriate textbook contents, teaching materials and resources, and customize them to fit specific teaching needs.

Secondly, this system supports a two-way, interactive and iterative process whereby teachers can browse, download, revise, re-create and upload material to the same site. The built-in architecture would anticipate and accommodate an on-going organic growth of the content driven by the bottom-up involvement of an ever-expanding body of users, stakeholders and volunteers.

Moreover, the platform allows users to download and print out the selected and customized textbooks and courseware. It also allows teachers and students to send online requests to printing houses for mass printing of the textbooks. Besides, electronic versions of the selected customized textbooks and courseware are available to support online and mobile learning. The platform also enables schools and teachers to generate an individual school site to house their customized textbooks and courseware.

B. Online textbooks and teaching materials

Open textbooks and other open educational resources will be placed on the platform. These include:

- Open textbooks at the degree and associate degree levels which are already available elsewhere will be included in the system for possible adoption by teachers and students.
Electronic versions of the course materials of seven core subjects of the Yi Jin project will be uploaded to this platform for all Yi Jin students to enjoy free access.

A complete set of open textbooks for the English subject at both secondary and primary school levels, covering the EDB’s prescribed syllabi, as well as associated teaching and learning materials, will be developed and provided on the platform. The number of subjects will increase with future development of the project.

Exemplary courseware at degree level of exemplary course units adapted from the OUHK’s existing courses will also be included.

How are the contents of the textbooks developed? Successful open textbook projects have produced very detailed guidelines regarding how the publishing work can be conducted. In our project, the OUHK’s course development model will be used to develop the open textbooks for primary and secondary schools.

A textbook development team will be formed for each textbook to be developed. The team will consist of an author, an instructional designer, and co-authors who also take the role of peer reviewers. A combined strategy will be employed to provide the contents and ensure that they can be made available within a reasonably short timescale and that they cost substantially less than traditional publishing and production. The modus operandi consists of:

- aggregating and selecting from the Web relevant and usable resource materials. This saves users tremendous time and effort that would be spent on sifting through the massive amount of information online and removes uncertainty as to the relevance to students’ teaching and learning.

- borrowing and adopting ‘off-the-shelf’ open textbooks from abroad offered freely for reuse, revision and redistribution under the Creative Commons Licenses. Many such open textbooks are specifically developed, comprehensive and complete for teaching and learning, albeit for somewhat different curricular and national standards. They can be translated, easily modified and adapted as a fast-track and economical way of content development.

- enlisting the support of experienced practitioners, especially teachers, to cooperate and collectively develop texts and associated material for individual or common needs. According to published information, a substantial number of schools and institutions in Hong Kong are already engaged in creating teaching materials in-house. The opportunity for mutual cooperation offered by this Open Textbook programme will provide extra incentives, and reduce the workload of single-handed development by individuals who are scattered among various educational organizations.

- deploying and recruiting professionals and experts to create original content where necessary.
fostering partnerships with local and overseas institutions and organizations to jointly develop and exchange textbooks and supplementary materials for mutual use or other targets in respective regions.

C. Quality assurance

To alleviate the worries and scepticism over the quality of free learning resources, a quality assurance mechanism will be set up and overseen by a team of subject experts, editors and technologists to monitor the development process, assess quality, and review each item admitted to the system. These professionals will take on the role of ‘co-authors’ and ‘gate-keepers’ for the quality of the textbooks. The content will be continually reviewed, updated, improved and enriched with reference to the ratings and feedback gathered online and offline. Apart from internal quality procedures, the following recourses will also be in place:

- Peer review – Where appropriate, the developed content will be forwarded to individual peers or groups from professional organizations, either through voluntary or paid service.

- Government review panels – In the case of textbooks for primary and secondary education, the final product will be submitted for assessment by the Review Panels of the Textbook Committee of the EDB in the same way as a commercial textbook, with a view to being placed on the Bureau’s ‘Recommended Textbook List’.

- Open review and rating – The online platform should provide an opportunity for teachers, educators, parents and other users to review and rate the materials publicly. Such transparency helps to identify any shortcomings, ensure the effectiveness of the particular resource and in turn further bolster its quality.

- Systematic evaluation and research – Systematic studies are carried out together to evaluate the service outcomes and assess the level of users and participants’ satisfaction.

D. Community and capacity building

Before development work begins, an investigative study to verify assumptions, identify expertise from the field of educational practitioners and prioritize tasks according to the needs and preferences of the target users will be conducted. In addition to providing the necessary data and precise information to determine the appropriateness of each job item, the research exercise will also serve to raise awareness of the opportunities and potential benefits available to contributors, participants and the general public.

A consortium made up of potential contributors and beneficiary schools and organizations which subscribe to the spirit and principles of open educational resources will be established to share expertise, provide manpower, coordinate efforts, and to spread knowledge in support of the continuous development of open textbooks and resources at the societal level.

At the individual level, interested and qualified authors, editors, teachers from
primary and secondary schools, and professors from tertiary institutions will be invited to join the teams of developers and contributors.

Training will be provided to teachers and professors, mainly on the teaching practices to be used with open textbooks, teaching materials and open learning resources. The training will help them to master the necessary skills to produce open textbooks, teaching materials and other learning resources. It will nurture members’ abilities to search, filter and select appropriate and legitimate open learning resources on the Web, and write, edit and digitize materials for content. It will also explain what good instructional design, is how quality is upheld and what tools should be used.

**Conclusion**

This paper briefly explained the textbook problems confronting Hong Kong and why open textbooks could be a solution to the problems. The OUHK’s open textbook project, which aims to establish a versatile online platform to store and support various kinds of open textbooks’ production and use, to develop textbooks and learning materials to start up the platform, will include a quality assurance system, and mechanism to build the capacity of potential users in order to maximize the benefits which can be derived from the system.

In the long run, the project will become a public platform primarily for teachers and students to access well organized learning material they may find useful, and for any other users with the enthusiasm to collaboratively contribute to the content of open textbooks, whether by way of writing, editing, enriching, commenting or amending. The expanding community and capacity thus generated will ensure a clear understanding of quality standards and requirements, and provide ample energy, relevant experiences and favourable conditions for the continuous improvement of the programme and achievement of successful outcomes.

**References**


8
Abstract:

What is the role of OERs in the broader society? This paper postulates the presence of two social domains that an individual navigates throughout one's life cycle: the Informal domain, which is characterized by the family, community, and the natural environment, and the Formal domain, which is characterized by public and private institutions and industry. It explores the role of the school system as the gatekeeper of the Formal domain, serving to train individuals for their roles in the legal, public sphere as well as to eventually legitimize their entry into the world of work. Moreover, the school system trains its students to imbibe the culture of the Formal domain and progressively detaches them from the natural and devalues the informal domain, leading to the myriad symptoms of the malaise that philosophers have associated with modernity and the unsustainable trajectory of modern society.

The internet, a generally decentralized and un-institutionalized arena, mostly follows the Informal domain in how individuals access and interact with it. However, we also find institutions creating their own spaces in the internet. Thus it is posited as a third domain. In this virtual “gray area” hovering above both domains, one can find a re-valuation and re-appreciation of the Informal domain, by providing a platform of communication for the public sphere through myriad virtual communities. This paper is an exploration of how OERs and current ICTs have made this delineation of domains less distinct, thus allowing it to act as a “keymaker” to the formal sphere. Through this platform for validation and equal valuation of the wisdom of the informal domains in interconnectedness, conservation, and sustainability, coupled with the drive of the formal domains towards progress and development, a society can balance its priorities and move towards the creation of sustainable policies and institutions.

Introduction

A systems approach to educational reform is imperative when one wishes to institute sustainable and holistic changes in society. However, it is necessary to also look at education not in isolation, but as part of the society in which it operates. Thus can we create a framework through which educational reform can be viewed, and come up with innovative policies and strategies with which to respond to perceived problems and shortcomings of the educational system. This paper is an exploration of society as a comprised of two physical and psychosocial domains, the role of education, and its impact on an individual's valuation of nature and of the human condition.

This analysis is made in the context of the Philippine society.

The case of Education in the two domains

Where does education begin? Every individual goes through more or less the same trajectory when it comes to life stages. A child is born in a family and is acculturated within the family. At this point, the main cultural unit is the family, and the child is simply a component of this unit. The family acts in behalf of the child: receives state care as a family, performs social community obligations as a family, and interacts with the natural environment as a family. The first teacher for each child is the family: parents, siblings, and extended members all contribute to the child's education. In a particularly close-knit community, all community members take on the
responsibility for the education and safety of all the children.

This initial domain is what I would call the **informal domain**. It is informal in the manner that all actions within the informal domain are not coded into ordinances and laws, and there are no formal mechanisms for ensuring that certain actions are implemented or prohibited. Diversity is appreciated and celebrated. All interactions are tacit and contextual, and the language of the informal domain is the mother tongue.

The informal domain is more natural in the sense that it is based on natural objects. It operates in a nature-based concept of time: the day is divided into periods (early-, mid-, and late morning, early-, and late-afternoon, early and late evening) and the year is divided into seasons. Activities are done within the context created by nature (i.e., by the forest, at the foot of the mountain, next to the river, etc). Thus, teaching and learning are also based on contexts dictated by nature, such as teaching and learning about agriculture, meteorology, economics, physiology, and reproductive health. The informal domain is such that it is built on interaction, connectedness, and intimacy with nature and with each other. The strengthening of networks to each other and to nature is the enabling factor in all its activities, such that it becomes the currency by which it values its outputs.

The **formal domain**, by comparison, is built from codified rules and regulations formulated by an organized group that is recognized by the community. It is comprised of institutions such as the local government, the school system, civil society, and industry. All activity done in the formal domain is driven by policy and monitored by the proper authorities, and the language of the formal domain is the official tongue.

The formal domain is more artificial in the sense that it is based on man-made concepts. It operates in artificial concepts of time, in minutes and hours, and in weeks and months (that are not based on the moon). Activities are done within the built environment: buildings and parks, classrooms and offices, malls and halls. The formal domain is built on and values the artificial/man-made environment that intends to control and subvert nature. In its bid to create order, the formal domain is restrictive of diversity and tries to stifle it by creating a dominant narrative and propagating this through its institutions. Since it is dependent on the man-made and artificial, it tends to value its output in terms of their monetary equivalents, as money is the enabler in this domain. This explains in part why the informal domain is less valued, since its outputs have no monetary equivalents.

It can therefore be argued that a systemic process of leaning towards the formal domain and devaluing the informal domain would eventually lead to the so-called malaise of modern culture, variously described as alienation, individualism, materialism, and hedonism that also extends to the devaluation and wanton use of nature. The dichotomy is usually put forward as one of traditional community as against modern society (Frank, 1987). This paper posits further that this may be explained by the unique position occupied by the school system.

**Education creates the Individual**

The entry of the child to the formal educational system is a milestone. It is the one event that signals the introduction of the child into the formal domain. It sets the child separate from the nurturing unit of the family to become a singular unit: an individual. Thus as an individual, the child navigates through the formal domain and is assessed through his or her individual achievements and failures. The formal domain gives the child a new identity and place separate from her or his identity in the informal domain. The child is not seen as a member of a family or of a community, he or she is appraised as a student of a grade level of a school, and is bound to the responsibilities and prescriptions of such a condition.
To be a member of the school system means acquiring the discipline of the daily grind. For five days in a week, the child, mind-body-and-heart, is required to attend to activities within the school building, to be inside a classroom, preferably sitting in a chair with a desk, and quiet. Thus the child learns ordered movement and restraint, and the capacity to work quietly within large organizations over long periods of time. So the child is brought to a walled room full of children of the same age, made to pay attention to the only adult in the room (and not to each other), and told to be still for the next two hours.

Classes are held on the dot, and through forty minutes the child is told one thing, and the next forty minutes the child is told another, totally different and mostly unconcerned with the first. Thus thinking is trained to be jumpy, erratic, and disjointed. After a period of time, the child is asked to report back what has been “learned”, and is rated (and valued) based on the child's capacity to hold on to and give back this information.

So for longer and longer periods of time, the child is trained to be away from the home, and to stay indoors without regard to the vagaries of nature. Thus the child begins to lose his or her connection with nature, and would later on end up devaluing nature, as the best hours of the day are spent cooped up in a classroom and engaged in a host of “other, more important things” which are dictated by a central authority figure. Moreover, the child is trained to sit still without regard to the needs of the body, whether for activity, or sleep, or pleasure, or comfort. Thus the child begins to lose intimacy with her or his body and emotions, and may eventually proceed through life without self-knowledge and body-knowledge.

Corollary to that is the express objective of the school system to produce good citizens and good workers. As such, curriculum competencies targeted are mostly for content, skills, and values useful to the formal domain. This is more pronounced in the tertiary level, as one of the functions of the academe is to prepare its students for the world of work. Even concepts about nature and the body are discussed through the lenses of the disciplines of Western science. Thus, one can say that the school system has the capacity to legitimize knowledge through the time and manner that it chooses to present such knowledge as lessons. Because the informal domain is not so highly valued, it follows that the knowledge of the informal domain is also not valued, and thus remains largely unvalidated and untaught.

**Exiting the domains**

The child may then exit the school system, either having finished basic education or by dropping out. It is notable that by dropping out, the child is removed not only from the school system but from the formal domain as a whole, and thereby relinquishes the identity and status given by the formal domain. This is the reason why dropping out is considered a heavy burden by the state, not because the child ceases to learn outside of the school system, but because the state has ceased to exercise its authority over the child. By dropping out, the child reintegrates him or herself fully into the family unit and thus moves back exclusively into the informal domain.

An individual who exits from the school system may remain in the formal domain by entering the world of work. If one has exited after completing his or her schooling, then one is considered for skilled or semi-skilled labor. If one has exited with college units or with a college degree, one is considered for sub-professional or professional labor. One may also become a licensed entrepreneur. Within the formal sector, one is assured of worker benefits, rights, and access to other institutions of the formal system such as banks and lending institutions, hospitals, and government services.

Can one exit the informal domain? I believe that one not so much as exits the informal domain but
rather allows the individualistic mindsets of the formal domain to bleed into the interactions and functions of the informal domain. This refers to the progressive dissolution of family and community ties, the devaluation of community culture, the individualistic appreciation of nature (usually, devoid of the connectedness and knowledge of context and rhythm that characterizes one who works with nature). Thus one might find institutional means for relating with self, family, and nature that is different from the intimate, connected, and relational manner that is borne by the informal sphere.

Where do the domains meet?

The fulcrum of both domains is the individual, who learns to navigate between two separate, if not disparate, domains that have different values, ways of knowing, knowledge systems, and codes of behavior. For many, their identities at the formal and the informal spheres are held distinct and separate, and they create different personas to deal with the demands and cultures of the two worlds.

In the case of the Philippines, a country which was a former colony of both Spain and the US, the formal domain is patterned from policies and institutions of its former colonizers, that even the worldview that built the formal domain is vastly different from that of the indigenous, informal domain. Thus, the disjoint between formal and informal domain is made even more evident.

As the formal domain holds legal authority and resources, it is critical to remake its dominant narrative to be able to create the psychosocial environment that is critical to building a sustainable society. To be able to do this, a shift in the educational system – the gatekeeper of the formal domain – is needed.

A Third Domain

The formal and informal domains meet with the individual, and it is the individual who then enters a third domain which is the Internet. Advances in ICTs have lowered costs as well as increased power and speed of the machines that allow for access to the internet. Thus, it has become quite ubiquitous in most of the developed world and fairly distributed in the developing world.

The internet is a decentralized system that depends on an extensive backbone of volunteer organizations by which autonomous networks are connected. It is an open platform that was designed in a way that makes it easy to overlay new kinds of technologies to the network. It has grown through the inputs of individuals and organizations acting independently. Its lack of a centralized authority figure, openness, appreciation of diversity, and capacity for social networking and crowdsourcing makes it reminiscent of interactions within the informal domain. On the other hand, the presence of institutions as well as industry makes it an equally ideal platform for the formal domain. In this manner, the internet acts as a platform for engagement – either as individuals or as communities or as institutions -- for both domains, a de facto DIY soapbox for all who wish to engage.

The internet is different from the first two domains where the individual's membership and subsequent interactions within it is neither by birth (as in the informal sphere) nor by necessity (as in the formal sphere), but rather by preference or desire. In the web, an individual can create a new identity (or identities) based on one's fancy, and has the option to reveal him or herself, or to maintain anonymity. Even the communities that one is a member of is based on active choice and agency, one finds and interacts with virtual communities where “members of a certain culture attempt to make themselves at home... and try to mold it in their own image (Miller and Slater, 2000).” Indeed, Cascio (2012) has framed it as “a manifestation of human desires.”
Making the invisible visible and challenging the dominant narratives

Because the internet is driven by user preference, it follows that this domain will reflect not only the dominant narrative of the formal domain, but more importantly the realities of the informal domain which are not adequately portrayed in the school system and mainstream media. It has become a platform in which local content – an expression and communication of a community's locally generated, owned and adapted knowledge and experience that is relevant to the community's situation (Khan, 2005)– is presented and celebrated. Indeed, the extraordinary increase in “peer production” of digital information products produced by individuals without any expectation of monetary gain is proof that individuals and communities are hungry for validation and representation of the informal domain.

Not only is the internet a platform for presentation, it also transforms the meanings of the local content that is presented. In a study of an African tribal religion which has in part migrated to the internet, Budka and Kemser (2004) noted that “many originally indigenous beliefs and practices are now leaving their local traditional settings and becoming widely available... and in the process... are transformed into new forms of world culture.” Moreover, the internet allows the consumer not just access to the content but also a means for connection to the community that produces the content. Thus, not only is the informal domain made visible, the platform also affords the capacity for which the content presented can be validated.

The internet's role in the presentation and validation of the informal domain can already be seen as a major move towards challenging the dominance of the formal domain. The challenge is furthered by its capacity to undermine the ability of any institution to control its own narrative. Through social networking and virtual communities, the dominant narrative is annotated by users who may like, comment, share, or remake the content for their own purposes.

Alternative networks and the Open access movement

The emergent power that allows users to challenge the dominant narrative is the collective voice of the networks formed in the internet. The third domain has become the de facto public sphere consisting of ‘network citizens’ who ‘participate in the creation of new decision-making capabilities as well as understand their informal power and responsibilities’ (McCarthy et al, 2005) These open social networks are self-generating and appear to function in much the same way as open systems in nature (Capra, 2004). This new kind of communication has an enormous impact on opinions, cultural trends, information spreading and even as the fundamental organizing mechanism in recent country-wide social movements (Borge-Holthoefer et al, 2012).

It is not surprising, therefore, that this networked activity has now been postulated as an open system of social production that depends upon the free exchange of ideas and labour (Peters and Araya, 2007) that give rise to effective, large-scale cooperative efforts, that is, peer production of information, knowledge, and culture. This is a new system of production that is the fruit of a “networked information economy... (wherein) important cooperative and coordinate action (is) carried out through radically distributed, nonmarket mechanisms that do not depend on proprietary strategies” (Benkler, 2006). Rather, it is driven by the user's individual need and creativity that is funneled to networks of like-minded individuals. This is typified by the emergence of free and open-source software. A notable example is the Linux/GNU system which is proof that products as complex as operating systems may be crowdsourced through a network of dedicated and skilled hackers, all working without monetary compensation.

A number of theorists have compared the Open source community to the “Gift Economy” practiced traditionally by North American First Nation tribes and ancient Chinese societies (Couros, 2006),
where within small tribal societies, the circulation of gifts established close personal bonds between people (Barbrook, 1998). In Open communities, Raymond (1998) opines that

“gift cultures are adaptations not to scarcity but to abundance. . . . Abundance makes command relationships difficult to sustain and exchange relationships an almost pointless game. In gift cultures, social status is determined not by what you control but by what you give away,”

indicating that the Open movement is highly reflective of how the informal domain operates.

Moreover, the creation of open source software is contingent on an apprentice-like system of learning wherein learning and mentoring is practiced within the community:

“Open source communities have developed a well-established path by which newcomers can “learn the ropes” and become trusted members of the community through a process of legitimate peripheral participation. New members typically begin... by working on relatively simple, noncritical development projects... As they demonstrate their ability to make useful contributions and to work in the distinctive style and sensibilities/taste of that community, they are invited to take on more central projects. Those who become the most proficient may be asked to join the inner circle of people working on the critical kernel code of the system. Today, there are about one million people engaged in developing and refining open source products, and nearly all are improving their skills by participating in and contributing to these networked communities of practice.”

(Brown and Adler, 2008.)

Thus, the open source community has created not only an open system of production but also a system of education that tends to parallel the values and methods of the informal domain.

This is not to say that the formal domain has not engaged in the Open access movement. The academe and the science community has, in fact, been its pioneers through the establishment of ERIC and MEDLINE as early as 1969. This is hardly surprising since educational and science communities, like Open source communities, are based on knowledge sharing among peers. Since then, open access to research has become the norm for the academe, and over 5,000 open access journals are available today (Bjork et al, 2010).

OERs: From Gatekeepers to Keymakers

Most notable is the engagement of the academe through the production of Open Educational Resources or OERs, which is often defined as “digitised materials offered freely and openly for educators, students and selflearners to use and reuse for teaching, learning and research (OECD, 2007).” With OERs, anyone with access to the internet also has access to the wealth of knowledge produced by the formal domain without having to engage in the formal domain as an official student or member of the educational community. Ideally, it allows for learning of content and skills of comparative quality to learning in the formal sphere to anyone, anywhere.

The import of such access is this: whereas the educational system has long been the gatekeeper to the formal domain, OERs have the capacity to act as keymakers to allow entry to the formal domain through (presently) unconventional means. (The term “keymaker” is derived from a fictional character from the movie Matrix Reloaded, whose function is to create shortcut keys to access all the aspects of the virtual realm of the Matrix through backdoor entry.) In other words, it is not to say that there are no more gates and gatekeepers, rather, that OERs, which are products of the formal domain contextualized in the Internet which operates similar to the informal domain, allow for the development of open education modalities such as lifelong learning, distance learning, home
schooling, etc as viable alternatives to the current educational system.

**Building a Sustainable Society**

The World Development Report in 1999 states that knowledge, not capital, is the key to sustainable social and economic development. From the analysis reported in this paper, it is evident that not only knowledge but the cultural mindset that inordinately values the formal domain and devalues the informal domain needs to be addressed in order for appropriate interventions that work with nature be initiated. Thus, the knowledge and values of the informal domain need to be re-inculcated through a thorough reform of the educational system, which acts as both drill sergeant and gatekeeper for the formal domain.

The way toward a viable solution, however, has already available. The development of the internet as a third domain that acts as a gray area and meeting point of the formal and informal domains, makes it possible to:

1. Revive the mindset and cultural values of the informal domain as the networks in the internet appear to parallel the values and methods of the informal domain,
2. Present and legitimize the knowledge, values, and worldview of the informal domain through local content created and distributed through social networking systems, and
3. Share the knowledge created by the formal domain through OERs and thus allow for the blossoming of viable and similarly rigorous alternatives to the current educational system.

Through this intervention, it is hoped that a more balanced perspective towards sustainability may be arrived at, and that multiple, diverse solutions may be generated to achieve it.

**References:**


Sharing OERs beyond borders: Technology and Business Issues

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Abstract
In Japan, several university consortia and national institutions have promoted OER movements. Japan Open Courseware Consortium (JOClW) holds meetings and seminars to share the experiences among the member organizations. The Open University of Japan (OUJ) provides a cross-institutional search service specialized in OERs, called “JOClW search”. “Working Group for the Sharing and Distribution of Academic and Educational Content” at “Academic eXchange for Information Environment and Strategy” (AXIES-csd, a new university consortium) operates task forces aiming at some new sustainable framework for quality learning content development and distribution.

On the international sharing of OERs, our institutions have several issues. Most of the content and metadata are described in Japanese and the content is not developed in reusable/remixable manners. While OUJ participates in Global Learning Object Brokered Exchange (GLOBE) consortium as a global federation of referatories, the metadata items for new-value added services are still limited. In this presentation, from the viewpoints of both learners and institutions, the requirements of internationally sharable materials and its sustainable developments will be discussed.
A BOTTOM-UP STANDARDS APPROACH TOWARDS DEVELOPING OERs

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Abstract

The Open Educational Resources (OER) movement is ten years old. Yet, there is still a lack of widespread implementations in educational institutions that adopt the three main principles of the OER movement. Starting with the use of open source software and the need to reuse educational contents, the SIM University has been trying out a possible development model which can be extended to realize the objectives of the OER movement. Specifically, this paper outlines the use of the open source based Ilias learning management system, the SCORM 2004 3rd Edition Specification (for creating different learning sequences) and the use of the licenses like the Creative Commons license to develop contents for students of the SIM University. The author offers some suggestions on how such a bottom-up developmental model can be expanded to form an implementable OER environment that can address learning sequences and content reusability.

Keyword: open source, open access, open educational resources, SCORM

1. An experimental model for implementing an OER environment

The intent of this paper is to demonstrate a bottom-up approach for the implementation of an OER environment especially in creating different learning sequences and achieving reusability. This is based on using open source software [1] and the publicly available SCORM (Sharable Content Object Reference Model) specification [2].

"Open courseware" here refers to making the courses freely available over the Internet. Such courseware might include lecture materials, references and readings, simulations, experiments and demonstrations. All these are made available to be used or adapted by faculties or individuals anywhere in the world, at no charge for educational, non-commercial use [5].

1.1 Development platform

In our experimental development model, we have chosen to use a Linux server (e.g. CentOS [6]) together with an open source based learning management system known as Ilias [7].
1.2 Using the SCORM Specification [2]

The Ilias learning management system (LMS) has also been certified to be compliant to the SCORM 2004 3rd Edition specification.

![E-Learning Standards](image)

Figure 4 – Ilias has been certified to be compliant to the SCORM 2004 3rd Edition Specification

Although the SCORM 2004 3rd Edition specification [8] is a newer specification than the SCORM 1.2 Specification [9], it is less popular than the latter. Yet, its advantage is that it allows the contents to be sequenced differently. Using the sequencing mechanism in the SCORM 2004 3rd Edition specification, we have developed the following contents [10]: Aerospace Management, Anatomy & Physiology, Appreciating Literature, BUS488 Strategy, Explorations in Physics and SEC 331e (Introduction to Security Studies).

Table 1 below shows the different sequencing mechanisms for the six content packages that have been developed. Although we can have many different sequencing mechanisms, we do not incorporate all of them in the development of the various content packages.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Course Name</th>
<th>Sequencing mechanism</th>
<th>No sequencing</th>
<th>Linear sequencing</th>
<th>Knowledge-paced sequencing</th>
<th>Competency-based sequencing</th>
<th>Remediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aerospace Management</td>
<td></td>
<td>√</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Anatomy &amp; Physiology</td>
<td></td>
<td>√</td>
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</tr>
<tr>
<td>3</td>
<td>BUS 488 Strategy (Marketing Unit)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Appreciating Literature</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>5</td>
<td>Explorations in Physics</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Theory &amp; Practice in Security Studies</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Figure 1 below shows a pre-test for the Aerospace Management course. Students who did not pass the quiz (e.g. getting only 65% out of 100% and the passing mark is 70%) will be prompted to go through the study materials before re-doing the pre-test again.

![Figure 1](image)

Figure 1 - Aerospace Management – Knowledge-paced sequencing

### 1.3 Formative Assessment

Yet another area is in the area of formative assessment.

We implemented some of the formative assessments using JavaScript codes. We believe that formative assessments like the above JavaScript-based quiz are highly portable and can really assist the students to learn better. The challenge for OER practitioners is really in the collection and classification of such resources.

### 1.4 SCORM content resources for sharing

One issue that we have encountered is that there are many freely available resources on the SCORM specification. Only some of them are centralized in the official website of the SCORM specification (i.e. at [http://www.adlnet.gov](http://www.adlnet.gov)). There are other websites that host some freely available SCORM-based educational contents.

It will be an interesting volunteer project if we can get interested volunteers to compile and set up a website containing all the freely available SCORM content packages, developed either in the SCORM 1.2 Specification or the newer SCORM 2004 3rd or 4th Edition Specifications. Such a volunteer movement can be something like the “Academic Volunteers International” movement mentioned by James Taylor (2007) in his paper on the OER University Concept [11].

### 2.0 Reusability Guidelines

Another big issue in the OER movement is the reuse or reusability concept.
“Reusability”, in the normal perception, refers to a state that is the direct, un-changed use of what is typically highly contextualized content designed for a specific group of individual learners.

This is where we can tap the work done in the SCORM world. In particular, the author refers to the document entitled “ADL Guidelines on Creating Reusable Content” as published by the Advanced Distributed Learning Initiative [12].

Reusability is important as, firstly, there are cost savings that will be generated from the reuse of learning objects. Secondly, designing reusable content typically implies creating small pieces of content. Thirdly, with reusability of the content, we can enable more individualized instruction. This helps to make learning more learner-centric.

Knowledge of reusability can help instructional designers to combine, or present or alter reusable content that is independent of the instructional decisions made about the appropriate learning context and/or the audience.

Perhaps the following diagram can illustrate the “reusability” concept better:

In the “ADL Guidelines on Creating Reusable Content”, four possible aspects of reusability were given. These are redeploying, rearranging, repurposing and rewriting.

2.1 Redeploying

With reference to Figure 9 above, the content from an auto mechanics class that teaches learners how to change a motor car’s flat tire can be deployed on multiple LMSs in many institutions without modification.

The content developed by an automobile association (e.g. by the AAS or the AAM) to teach members about safety considerations when they have a flat tire could
be used, unchanged, as part of the driver’s education curriculum in an institution, or in some community centre’s car maintenance course.

2.2 Rearranging

The content objects on “Recognizing a Flat” and “Safety Precautions” can be taken out for use in another course on Automotive Safety. This shows that it is important to organize the materials such that the parts are highly modular and portable.

The course on Automotive Safety can also be used in schools and other places where there is a need to teach the skills and safety precautions on recognizing a flat tire and take the necessary precautions.

2.3 Repurposing

The Repurpose row depicts how content about recognizing a flat tire and flat tire safety precautions could be combined with content about recognizing engine problems and engine safety precautions to create a new collection called Recognizing Car Trouble.

2.4 Rewriting

In the diagram above, the safety precautions content is unchanged, the locating the spare tire content has been rewritten to specifically target car model 891s, and the removing the flat tire content also remains unchanged.

Reusability is a big issue which needs to be worked out. Guidelines like the Reusability Guidelines from the ADL Initiative are most welcome for OER practitioners to implement reusable e-learning contents.

3. Conclusions

This paper proposes a developmental model that is based on the SCORM 1.2 or SCORM 2004 Specification. Such a model is proposed as, firstly, much of the technical and developmental issues have been worked out by staff members in the Advanced Distributed Learning (ADL) Initiative. There are software tools, guidelines, content examples, LMSs and conformance tests. Secondly, SCORM is the de facto technical e-learning standard that almost all e-learning content publishers know of. Another reason is that SCORM content packages support the reusability concept. Hopefully, with the use of guidelines, we can encourage more OER practitioners to practice reusability and reduce the wastage of content resources. Fourthly, the SCORM 2004 Specification allows different learning sequences to be built into the content package. With different learning sequencings, we can allow different learners to learn according to their learning preferences, at least in the order in which the contents can be presented to them.
The author believes that once such a bottom-up approach towards the development of OER resources is realized, we can then move on to handle other bigger issues in OERs.

References

Abstract

Wawasan Open University has been the pioneer institution in the region to respond to the global advocacy for the OER movement. The OER-Asia initiative in 2010 under the auspices of the University for advocating and disseminating relevant information about OER as well as developing training materials and conducting research in this area. OER-Asia as well as the University made concrete contribution to the drafting the World OER Declaration jointly by the Commonwealth of Learning and the UNESCO. Responding to the advocacy for OER by the OER-Asia Initiative and other global initiatives the Wawasan Open University in spite of being a new organisation took the bold decision to join the OER movement. In the last one and half years the WOU has managed to make substantial progress in this area. This paper attempts to present the major aspects of OER Policy adoption and implementation.

Introduction

The Council of the Wawasan Open University in its meeting in December 2010 asked the University to consider and develop a proposal for possible adoption of OER and bring out a detailed implementation plan in order to transform the existing course development process with an aim to increase the quality and efficiency of developing course materials. Since then the University engaged itself in deliberating on various pros and cons of OER development. A discussion paper titled ‘OER Integration in WOU-Policy Directions, Strategic Outputs and Action Plan’ was drafted and this was discussed in several forums including the OER Steering task group which was constituted for the purpose of formulating further plan of action. After long and extensive deliberations a WOU-OER Policy was drafted for consideration and approval of all governing bodies of the University.

Policy Formulation and Implementation Details

Details regarding the OER policy formulation and implementation of related task are presented in the following paragraphs:
**WOU-OER Policy:** An OER Policy for WOU with implementation strategies has been adopted by the OER Steering Committee, Senate, Management Board and endorsed by the Board of Governors of the University. The broad OER Policy declaration is given below:

“**WOU will promote and implement the creation, reuse, remix, repurpose and redistribution of Open Educational Resources (OER) within an Open Licensing framework**”

**WOU-Open Licence Policy (OLP):** The University has adopted an Open Licence Policy with CC-BY-ND-SA as the licence for all selected course ware. It will also develop guidelines for using and mixing OER with varied open licences to make sure that legally accepted norms and standards are uniformly practiced in the University.

**Development of OER integrated Courses:** Two courses have already been developed in WOU using OER. These were presented in January 2012 and July 2012. Experience of developing and presenting these pilot courses is expected to give the University the required insight into OER integration leading to feasible and effective models. A detailed report on these two pilot courses is being prepared. This would help modifying appropriately (with OER integration) the course development policy and practice being adopted by Schools now. All four Schools of Studies of the University have prepared 'School-specific OER Plans' for implementation during 2012-13.

**OER Capacity Building:** A detailed Plan for OER capacity building has been endorsed by the Senate and reported to the BoG. The training areas will include:

- Knowledge and understanding about concept of OER and its development in the last decade
- Knowledge and skills required for searching and identification of OER materials including Reusable Learning Objects (RLOs) to suit different programme and course areas
- Knowledge about different open licences and understanding and skills for using and remixing OERs/RLOs with varied open licences
- Skills required for creating/adopting appropriate learning designs in an OER based e-learning environment.

Starting with a town-hall meeting in March 2012, a number of training workshops have been organised for academic and academic support staff in OER creation, search, licensing and designing learning with OER materials.

**OER Resource Support:** Library and Learning Support Unit has created an OER Repository in the staff portal where OER materials are uploaded for internal use. The LLSU will be identifying new OER materials relevant to WOU
programmes and courses and updating it regularly. OERs identified by the
Schools can also be deposited in this repository. Such a Repository of available
OER multi-media materials relevant to the programmes/courses of WOU will be
an excellent resource for the academics as well as students of the university.

**WOU-OER Website:** Now the University has developed a WOU-OER website for
making available OER created by WOU for public access and use. This
webpage will be linked to a repository where OER materials developed by WOU,
created by institution (e.g. course materials) and by individual staff members (e.g.
journal articles, seminar presentations etc) will be uploaded. The LLSU will be
the custodian of these materials. The decision regarding which courses/materials
will be made ‘open’ (with CC-BY-NC-SA licence) will be decided by the OER
Steering Committee with approval of the Senate.

**Newly approved Models of Course Development:** The Senate and BoG
recently approved the following two models for Course Development to be
adopted by the University in future.

- ‘Warp-around model’ with only OER.
- ‘Stand-alone model’ based on copyrighted books or/and OER

**Revision of SOPP for Course Development:** Course Development Committee
will review and revise the SOPP for Course Development based on the
requirements of the two approved models as well as the feedback received from
staff members who were involved in the development of the two pilot courses.

This work is licensed under a [Creative Commons Attribution-ShareAlike 3.0 Unported License](http://creativecommons.org/licenses/by-sa/3.0/).
Open Educational Resources (OER) are teaching, learning and research materials that have been released under an open licence that permits online access and re-use by others. The 2012 Paris OER Declaration encourages the open licensing of educational materials produced with public funds. Digital data and data sets produced as a result of scientific and non-scientific research are an increasingly important category of educational materials. This paper discusses the legal challenges presented when publicly funded research data is made available as OER, arising from intellectual property rights, confidentiality and information privacy laws, and the lack of a legal duty to ensure data quality. If these legal challenges are not understood, addressed and effectively managed, they may impede and restrict access to and re-use of research data. This paper identifies some of the legal challenges that need to be addressed and describes 10 proposed best practices which are recommended for adoption to so that publicly funded research data can be made available for access and re-use as OER.

Keywords: Access, Re-Use, Research Data, Public Funds, OER, Legal Challenges

1. PUBLICLY FUNDED RESEARCH DATA AS OER

“Publicly funded research” is research conducted by government agencies or departments, as well as by other parties using public funds provided by any level of government.¹ Research data exist in both digital and non-digital formats comprising textual records, numerical scores, compilation, images, sounds and algorithms.²

There are strong justifications for enabling publicly funded research data to be made available as OER. Research activities are undertaken with the aim of creating, advancing and increasing the stock of knowledge. Dissemination and utilisation of research outputs enhances the returns on public investment in research to the society at large.³ Socio-economic benefits are gained by enabling access to and re-use of publicly funded research data as OER since economic growth in the era of the-knowledge based economy requires interactive and open dissemination of data and information.⁴ Enabling access to and re-use of publicly funded research data as
OER can stimulate innovation\textsuperscript{5} which draws upon existing knowledge and information.\textsuperscript{6}

2. LEGAL CHALLENGES

There is a myriad of legal challenges to the objective of enabling access to and re-use of publicly funded research data as OER. Understanding this legal dimension and managing it effectively is essential in facilitating access to and re-use of research data.

A primary consideration is that much research data is subject to intellectual property rights which may be exercised by the rights owner to prevent or limit access and re-use.\textsuperscript{7} Where research data is copyright protected, rights to use or re-use it are subject to the scope of legitimate use prescribed by the law, which is usually restricted to particular users and specific acts or purposes (such as permitted under the fair dealing exception for research and study). \textsuperscript{8} Data users must obtain permission from data owners for access, use and re-use beyond the scope of the uses permitted under the legislation.\textsuperscript{9} Obtaining relevant permissions and negotiating licenses for research data can be a costly and time consuming process which may effectively preclude its use or re-use.\textsuperscript{10} If publicly funded research data are to be made available as OER, all intellectual property rights must be identified and managed in a manner consistent with, and that gives effect to open access and re-use objectives.\textsuperscript{11}

Legal challenges also arise from ambiguities about ownership of publicly funded research data. Researchers who generate data may be parties to contractual relationships with public funding agencies, other research collaborators, employers and research institutions.\textsuperscript{12} In the context of a complex web of contractual relationships, researchers are often unsure about who owns the data or who has the right to authorise access to and re-use of it.\textsuperscript{13} There are also legal challenges arising from confidentiality, privacy and national security laws. Researchers are frequently subject to contractual, statutory or common law obligations to maintain the confidentiality of their research findings, including the data generated by the research project. Information privacy laws often present seemingly insurmountable barriers as access to and re-use of identified/identifiable personal information without the consent of the persons to whom the data relates will violate their right to informational privacy. Statutory protection of national security interests would prevent the disclosure of research data which would be prejudicial to national security.\textsuperscript{14}

Novelty requirements in patent law are also relevant in determining how, and when, to provide access to research data. Premature disclosure of research data will preclude the patenting of an invention if the disclosed research data is considered as prior art and renders the invention no longer novel.\textsuperscript{15} Novelty requirements encourage researchers to restrict, limit, delay or withhold disclosure of the research data prior to the filing of a patent application.\textsuperscript{16} Lack of a legal duty to ensure data quality presents yet another legal challenge. The laws in most countries do not impose any duty of care on data providers who release the research data voluntarily, for free or without profit to the public.\textsuperscript{17} Therefore, data users need to consider the risks of obtaining incomplete, unfit, inaccurate or erroneous research data.\textsuperscript{18}
3. ADDRESSING THE LEGAL CHALLENGES

To overcome the potential legal impediments to enabling access to and reuse of publicly funded data as OER, the following best practices are proposed for adoption:

i. The relevant open access policy should make it clear that, subject to restrictions required for confidentiality, privacy and national security purposes, the owner/custodian of publicly funded data is required to permit access, use and re-use, including for data that is protected by intellectual property rights.19

ii. Guidelines should clarify ownership of publicly funded research data created by: i) researchers in and outside the course of employment; ii) non-employee researchers; and iii) researchers involved in research collaborations with other researchers.

iii. Publicly funded research data should be deposited in an open access repository following the expiry of an embargo period which allows data exclusivity. The duration of the embargo period depends on the requirements of the public research funding agency but, where it is not specified by the funding agency, data release should occur:
   a. not later than two years from the collection/creation of the research data; or
   b. immediately upon the first publication based on the research data; or
   c. not later than one year from the end (either by expiry or termination) of the award/grant which funds the collection/creation of the research data; or
   d. not later than one year upon completion of the research project for which the research data is collected/created.

iv. Rights to use publicly funded research data should expressly permit acts that include the following:
   a. quoting long excerpts;
   b. distributing full-text copies to students and colleagues;
   c. making copies on CDs for bandwidth-poor regions;
   d. distributing semantically-tagged or otherwise enhanced (modified) versions;
   e. migrating to new formats or media to ensure that documents remain readable as technologies change;
   f. creating and archiving copies for long term preservation;
   g. including works in a database or mash-up;
   h. translation into another language; and
   i. copying for the purposes of indexing, data mining and other kinds of processing.20

v. Publicly funded research data which are protected by copyright and which are released as OER should be licensed under a Creative Commons Licence (CC Licence). The most liberal CC Licence, Creative Commons Attribution (CC BY) - which reserves only the right to be attributed as data owner - should be adopted as the default licence for OER data.21

vi. Publicly funded research data which contains confidential information should only be released where measures are in place to protect the confidentiality of the information. Such methods include data suppression, data random perturbations, and data coding and recoding. Where it is not appropriate or possible to use such methods to protect the confidential

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19
20
21
information, access to and reuse of publicly funded research data as OER must not be provided.

vii. Publicly funded research data which contains direct/indirect identifiers or sensitive personal information of identified/identifiable subjects must only be released in a form that protects the informational privacy of the subjects of the research data. Access to and re-use of the research data is enabled by applying data redaction techniques such as anonymisation/de-identification, pseudonymisation, obfuscation, perturbation or data generalisation.

viii. Disclosure of research data containing information which is classified as prejudicial to national security is strictly prohibited. To avoid uncertainty, a classification of research data must be developed. Publicly funded research data which is not classified as restricted may be released for access and re-use.

ix. A timeframe for patent applications to be filed must be fixed to avoid any unnecessary delay in data release. A decision to patent must be made by the rights holder within six (6) months after formal notification of the invention. Where the decision is made not to patent the invention, the research data must be immediately released. Where the decision is to patent the invention, the patent application should be filed within six (6) months from the date the decision was made, unless it is shown that it is not possible due to the complexity of the patent to be filed.

x. A standard of care to ensure data quality, applicable to all data providers should be developed. The duty to ensure the quality of the research data is shared between a data creator ("primary data provider"), a data owner (if different from a data creator) and a repository/archive/enclave centre where the research data is deposited (a data owner and data repository/archive/enclave centres are known as "secondary data providers"). A primary data provider must supply the metadata which enables data users to assess the quality of the research data. A repository/archive/enclave centre must ensure that the primary data provider declares whether the research data is subject to peer review in-line with accepted best practice. Where the research data is not subject to peer-review, the primary data provider must warn the data users about the fact.

4. CONCLUSION

Where research data are produced with public funds, there are plausible moral and economic arguments supporting the view that it should be made freely available for access and re-use. However, legal challenges arise when providing for access to and re-use of publicly funded research data, based on intellectual property rights, confidentiality and information privacy laws, and the lack of a legal duty to ensure data quality. If these legal challenges are not understood, addressed and effectively managed, they will hinder the achievement of open access objectives. By adopting the best practices described in this paper, some of the most significant potential legal impediments can be overcome, enabling publicly funded research data to be made available for access and reuse as OER.
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Abstract

Open Educational Resources (OER) are fast becoming a global phenomenon which could potentially provide free access to knowledge for the masses. Since the inception of this concept, governmental and non-governmental grants alongside generous philanthropy have given rise to a vast array of OER repositories all over the world. With this movement gaining momentum, more and more of the learned community have started contributing resources to these OER repositories making them grow exponentially rich in knowledge. However, despite the availability of a large number of OER repositories, the use and re-use of OER are yet to become mainstream in many regions and institutions. One reason for this slow uptake is the inability to effectively search and locate desirable OER using the available search methodologies as it would be next to impossible to trawl through all the disconnected and disparate repositories manually. The findings discussed in this paper are part of a broader study into the OER landscape in the Asian region concentrating mainly on China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Philippines and Vietnam where close to five hundred and eighty academics from public, private not-for-profit and private for-profit institutions participated. This research paper discusses how Asia fares with respect to searching and locating desirable OER and whether it is truly a barrier to the wider adoption of OER for teaching in the region.

Keywords: Desirability of OER, Open Educational Resources, OER, Searching and Locating OER, OER in Asia, Barriers to OER.
1 Background

The Open Educational Resources (OER) movement has gained much momentum recently as a relatively new global phenomenon which is capable of bridging the knowledge divide. With increased funding and advocacy by governmental and non-governmental organisations coupled with generous philanthropy, OER are fast becoming mainstream in many academic circles. However, even though the number of OER repositories has grown exponentially over the years, boasting rich archives of quality OER in various disciplines, the wider adoption of OER in teaching still remains low especially in the Asian region where the necessity for OER is much higher.

One limitation inhibiting the wider adoption of OER is the current inability to effectively search and locate relevant and usable OER from a diversity of sources (Yergler, 2010). This inability is further heightened by the disconnectedness and disparateness of the vast array of OER repositories currently available online as no single search engine is still able to locate resources from all the OER repositories (West and Victor, 2011). According to Dichev and Dicheva (2012) one of the major barriers to the use and re-use of OER is the difficulty of finding quality OER matching a specific context as it takes an amount of time comparable with creating one’s own materials.

The most common method for searching and locating OER is to use generic search engines such as Google, Yahoo! or Bing. Even though this method is the most commonly used, it is not the most effective as discussed by Pirkkalainen and Pawlowski (2010) who argue that “searching this way might be a long and painful process as most of the results are not usable for educational purposes”. As possible alternatives to this method, many methods such as Social-Semantic Search (Piedra et al., 2010), DiscoverEd (Yergler, 2010) and OCW Finder (Shelton et al., 2010) have been introduced. However, Abeywardena, Raviraja and Tham (2012) state that despite all these initiatives there is still no generic methodology available at present to enable search mechanisms to autonomously gauge the desirability of an OER which is a function of (i) the level of openness; (ii) the level of access; and (iii) the relevance; of an OER for ones needs.

Knowing the issue of the inability to search and locate desirable OER, this research paper discusses how this inability is affecting the wider adoption of the use and re-use of OER in the Asian region and presents a set of recommendations which would improve the effectiveness of the search and location of specific, relevant and quality OER. The paper is structured into four key sections under the headings methodology, findings, discussion and recommendations.
2 Methodology

A regional group of researchers (collaborators) from China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Philippines and Vietnam, who are currently active in the OER arena, jointly developed a survey instrument consisting of seventy-nine independent items which would be used to elicit an understanding of the OER landscape in the Asian region with respect to (i) the use of digital resources; (ii) the use of OER; and (iii) the understanding of copyright from both an individual as well as an institutional perspective. The survey was conducted using hardcopies and an online version over a period of twelve months by the collaborators where approximately five hundred and eighty responses were gathered from academics who has had some exposure to the concept of OER. The responses were then consolidated and split into two cohorts according to (i) individuals who have experience in OER; and (ii) competent authorities of institutions who can comment holistically on the institution’s practice of OER. The resulting data was analysed using the open source statistical analysis software package PSPP and was published by Abeywardena and Dhanarajan (2012). The findings discussed in this research paper are part of the first cohort which concentrated on the individuals’ perspective.

3 Findings

For the purposes of this particular research paper, the analysis of the data only concentrates on four hundred and twenty responses (N=420) from eleven countries which represent the various Asian regions as shown in Figure 1.
The cohort comprises of academics from 312 (74.30%) public, 63 (15%) private not-for-profit and 45 (10.7%) private for-profit institutions. The extent of the use of OER by the participants in their teaching is shown in Figure 2 and their attitudes towards using OER in their teaching are highlighted in Table 1.

![Figure 2 Use of OER in teaching](image)

**Table 1 Attitudes towards using OER in teaching**

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reusing OER is a useful way of developing new courses</td>
<td>77% (240)</td>
<td>3.5% (11)</td>
<td>19.5% (61)</td>
<td>100% (312)</td>
</tr>
<tr>
<td>Exploring the available OER worldwide will enhance my teaching and raise standards across the University</td>
<td>79.8% (249)</td>
<td>1.9% (6)</td>
<td>18.3% (57)</td>
<td>100% (312)</td>
</tr>
</tbody>
</table>

To understand the OER downloading habits of the participants, they were asked whether they predominantly download OER from OER repositories or whether they freely download them from the internet using search engines (Figure 3).

![Figure 3 OER downloading habits](image)
Table 2 shows the extent of use of the available search methodologies for locating OER according to the respondents who have used OER in their teaching before (Figure 2). This cohort also mentioned that they locate OER through other means such as by word of mouth from colleagues, through Wikipedia and through face-to-face networking in addition to the common methodologies mentioned in the survey instrument.

Table 2  Extent of use of available search methodologies for locating OER

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Use less</th>
<th>Use more</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic search engines such as Google, Yahoo, Bing etc.</td>
<td>3.1%</td>
<td>96.9%</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td>(189)</td>
<td>(195)</td>
<td></td>
</tr>
<tr>
<td>Specific search engines such as Google Scholar</td>
<td>31.1%</td>
<td>68.9%</td>
<td>(60)</td>
</tr>
<tr>
<td></td>
<td>(133)</td>
<td>(193)</td>
<td></td>
</tr>
<tr>
<td>Wikieducator Search facilities</td>
<td>51.8%</td>
<td>48.2%</td>
<td>(99)</td>
</tr>
<tr>
<td></td>
<td>(92)</td>
<td>(191)</td>
<td></td>
</tr>
<tr>
<td>Specific search facilities of OER repositories such as OCW, Connexions etc.</td>
<td>56.8%</td>
<td>43.2%</td>
<td>(108)</td>
</tr>
<tr>
<td></td>
<td>(82)</td>
<td>(190)</td>
<td></td>
</tr>
<tr>
<td>Any other methods for locating OER</td>
<td>66.7%</td>
<td>33.3%</td>
<td>(50)</td>
</tr>
<tr>
<td></td>
<td>(25)</td>
<td>(75)</td>
<td></td>
</tr>
</tbody>
</table>

When asked what barriers they consider to be significant to the use of OER, 64% of the participants who had used OER before in their teaching mentioned that the lack of awareness of the university OER repository and other OER repositories was a major barrier. 56.6% of the same cohort mentioned that the relevance of the available OER to their teaching is also one of the barriers for wider use of OER.

Table 3 shows how the participants felt with respect to the lack of ability to locate specific, relevant and quality OER for teaching. In this context (i) specific denotes the suitability of an OER for a particular teaching need. For example, an OER on physics from the final year syllabus of a physics degree would not be suitable for a high school physics class; (ii) relevant denotes the match between the content of the OER and the content needed for a particular teaching need. For example, physical chemistry is not relevant for a teaching need in organic chemistry; and (iii) quality denotes perceived academic standard of an OER for a particular teaching need.

Table 3  The importance of locating specific, relevant and quality OER for teaching

<table>
<thead>
<tr>
<th>Lack of ability to locate specific and relevant OER for my teaching</th>
<th>Unimportant</th>
<th>Important</th>
<th>Neutral</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20.5%</td>
<td>57.4%</td>
<td>22.1%</td>
<td>(307)</td>
</tr>
<tr>
<td></td>
<td>(63)</td>
<td>(176)</td>
<td>(68)</td>
<td></td>
</tr>
<tr>
<td>Lack of ability to locate quality OER for my teaching</td>
<td>13.8%</td>
<td>67.6%</td>
<td>18.6%</td>
<td>(306)</td>
</tr>
<tr>
<td></td>
<td>(42)</td>
<td>(207)</td>
<td>(57)</td>
<td></td>
</tr>
</tbody>
</table>
4 Discussion

This research paper is underpinned by the hypothesis that the inability to effectively search and locate desirable OER using current technologies is posing a barrier to the adoption of OER for teaching in the Asian region. The nine countries identified in Figure 1 are representative of the majority of sub-regions in Asia (Table 4).

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 China</td>
<td>East Asia</td>
</tr>
<tr>
<td>02 Japan</td>
<td></td>
</tr>
<tr>
<td>03 Hong Kong</td>
<td></td>
</tr>
<tr>
<td>04 South Korea</td>
<td></td>
</tr>
<tr>
<td>05 Malaysia</td>
<td>South East Asia</td>
</tr>
<tr>
<td>06 Philippines</td>
<td></td>
</tr>
<tr>
<td>07 Indonesia</td>
<td></td>
</tr>
<tr>
<td>08 Vietnam</td>
<td>South Asia</td>
</tr>
<tr>
<td>09 India</td>
<td></td>
</tr>
</tbody>
</table>

Out of the academics who had participated in the survey, 65% had used OER from other academics in their teaching and 80% mentioned that they will use OER in their teaching in the future. This shows that the use of OER is gaining popularity and wider acceptance in the Asian region. Additionally, referring to Table 1, the attitudes towards the use of OER is also taking a positive turn as 77% of the participants found OER to be a useful way of developing courses while 79.8% agreed that OER will improve the standard of their teaching. However, even though the use of OER and the attitudes towards it are improving, 57.4% of the academics found that the lack of ability to locate specific and relevant OER was an important inhibitor towards the use of OER. Furthermore, as shown in Table 3, 67.6% of the academics felt that the lack of ability to locate quality OER was also an issue worth consideration.

In order to identify the reason behind academics not being able to locate desirable OER for their teaching, the mode of searching and locating OER needs to be scrutinised. Looking at Figure 3, it is apparent that most of the time academics search and locate OER which are freely available on the internet as opposed to using specific OER repositories which maintain a certain level of quality. Furthermore, these repositories are equipped with native search mechanisms which facilitate the location of more specific and relevant OER for a particular teaching need. However, as shown in Table 2, only 43.2% of the academics use specific search facilities of OER repositories. Therefore, the lack of use of dedicated OER repositories and their tailored search mechanisms for locating OER has indeed become an inhibitor with respect to searching and location of specific, relevant and quality OER. 64% of the same cohort mentioned that the lack of awareness of the existence of such repositories was the key contributor to this current situation.
Looking at Table 2, it can be seen that generic search engines such as Google, Yahoo! and Bing are used almost all the time for searching and locating OER compared with the specific search mechanisms such as Google Scholar or the native search mechanisms of OER repositories. From this comparison, it is apparent that many academics depend on generic search mechanisms to locate the required OER for their teaching purposes. However, the inability of these generic mechanisms to locate desirable OER for a particular teaching need, as highlighted in literature, has in fact become an inhibitor to the wider adoption of OER for teaching in Asia.

5 Conclusions and Recommendations

Open Educational Resources (OER) are fast becoming a global movement which could potentially bridge the knowledge divide between the masses. Even though there are a large number of rich OER repositories located across the globe, the uptake with respect to use and re-use of OER in teaching has been slow due to a number of reasons. One such reason is the current inability to effectively search and locate specific, relevant and quality OER from the various disconnected and disparate OER repositories. With the rapid mushrooming of new OER repositories and the expansion of the existing, it has become highly infeasible to manually trawl each repository to identify OER required for specific teaching purposes. As such, this limitation has become an inhibitor to wider adoption of OER especially in the Asian region.

When considering the technological limitations, the inability of mainstream searching mechanisms, such as online search engines, to accurately distinguish between an OER and a non-OER material becomes a major hurdle. Although one might argue that the most popular search engines do provide the advanced facilities to define various filter criteria which would refine the searches, these search engines are not tailored to easily and effectively locate OER material which are the most suitable for a specific purpose. As such the OER consumers will need to resort to frequenting the more popular OER repositories such as Rice Connexions, MIT OCW or Wikieducator to search for the OER material they are after. However, this too has become a cumbersome and time consuming task as the number of repositories and the volume of each repository keeps on expanding. Thus it becomes an infeasible affair to keep track of all the OER repositories available. Also, users would be spending quite a number of hours on these popular but disconnected OER repositories conducting multiple searches using the native search mechanisms; and by so doing limit the scope as well as the variety of OER material available to them. Ultimately, even though many of these popular OER repositories hold a rich selection of material, the user is stuck in a scenario where the use of these materials is not a choice but a lack of options.
Another factor inhibiting the effective searching and location of specific, relevant and quality OER is the disparateness and disconnectedness of present day OER archives. Within the context of parametric web based searching mechanisms, the terms *specific*, *relevant* and *quality* denote key parameters which need to be considered seriously. *Specific* refers to the uniqueness of a piece of information which is returned as a result of an online search. This parameter is important with respect to ensuring that only a minimum number of instances of a piece of OER material are presented to the user. The term *relevant* refers to the standardisation of metadata which will facilitate more accurate searches. *Quality* stands for the desirability of OER material. As such, the disparateness and the disconnectedness of OER repositories can be broadly attributed to (i) the lack of adoption of a standardised method for defining metadata; (ii) the lack of a centralised search mechanism which will identify and locate OER from all of these disconnected repositories; and (ii) the inability to indicate the desirability of an OER returned as a search result.

Considering the lack of a standardised method for defining metadata for OER, it can be argued that the definition of metadata cannot be made one hundred percent accurate or uniform for all OER resources if done by the creator(s) of the resource. Therefore the use of human defined metadata in performing objective searches becomes subjective and inaccurate. A possible solution to overcome this inaccuracy and to ensure uniformity of metadata would be to utilise a computer based methodology which would consider the content, domain and locality of the OER material, among others, for autonomously defining uniform metadata.

The authors are currently involved in a pilot project named “OERScout” which uses artificial intelligence (AI) techniques combined with text mining algorithms to cluster OER from the various disconnected and disparate repositories by autonomously identifying keywords which best describe the content of the OER. This system looks at categorising all the OER from the repositories with an aim to providing accurate recommendations of desirable OER based on a particular curriculum provided by an academic.

**Acknowledgements**

This research project is funded through the Grant (# 102791) generously made by the International Development Research Centre (IDRC) of Canada through an umbrella study on Openness and Quality in Asian Distance Education.

The authors acknowledge the contributions made by Li Yawan, Li Ying, K.S. Yuen, Alex Wong, V. Balaji, Bharathi Harishankar, Daryono, Tsuno Yamada, Yong Kim, Patricia Arinto and Minh Do who are the country collaborators for the project. The authors also acknowledge the contributions made by Lim Choo Khai and Khoo Suan Choo with respect to data compilation and administrative assistance.
Ishan Sudeera Abeywardena acknowledges the support provided by the Faculty of Computer Science and Information Technology, University of Malaya, 50603, Kuala Lumpur, Malaysia where he is currently pursuing his doctoral research in Computer Science and the School of Science and Technology, Wawasan Open University, 54 Jalan Sultan Ahmad Shah, 10050, Penang, Malaysia where he is currently employed.

References


TAGGING OER FOR SKILLS PROFILING:
USER PERSPECTIVES AND INTERACTIONS AT NO COST

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ABSTRACT:

This Paper reports our research on how open educational resources (OER) should be labelled not only with social tagging but also for skills profiling. We have previously reported the need for wider use of skills profiling: as a practical way forward for very-low-cost massive-scale prior learning assessment and recognition (e-Type-3 PLAR). The result from tagging for skills profiling is that OER become suitable for a personalised curriculum and better fit-for-purpose. And all this at no cost to the institution.

Keywords: Tagging OER, Academic profiling, PLAR, No cost, User perspectives

1. INTRODUCTION:

In this Paper we explain how online self-assessment e-Type-3 PLAR can reduce the institutional costs for accreditation and at the same time serve to intrinsically motivate the student. Then we explain what skills profiling should be created to establish academic profiles for course entry, course graduation, and any stages in between. Finally we suggest that OER are labelled not only using social tagging but also for skills profiling. The overview is shown in FIGURE 1 below in which the core interactions by the user are essentially free of cost, and the later accreditation costs for the institution are at an absolute minimum, which then allows for use in massive open online courses.

FIGURE 1: The System Design for Tagging OER for Skills Profiling
There are now huge numbers of open-educational resources (OER) accessible online around the world in various hub repositories. Some open universities claim to host thousands of courses and resources, yet a course teacher finds only six OER of interest and these just plain old powerpoint that are out-of-date and not relevant to the purpose at hand. Even after a student finds an interesting OER, she may need additional intrinsic motivation to learn from it. Students tend to show no immediate learning benefit from an OER unless the teacher then goes through the key points in a flipped-classroom approach. Certainly better social tagging for OER should improve their utilisation by teachers, students and lifelong learners. Social tagging by each user can improve the chances of discovering a best-fit OER, and such user-led personalisation of OER can offer a way forward without needing teaching guidance on which OER is best.

2.1 METHODS:

Social Tagging for OER

‘What we find, changes who we become’ Morville, 2006

Social tagging acts as advance organisers by the original author(s) to serve as navigational aids for intended users, and later as filtering for subsequent users. Social tagging is a capability added onto an OER to allow each user to confirm or adjust the search tags - which indicate the level and the quality on each keyword. The user can add extra keywords. The level is initially signalled by the original writer and can be finely tuned by the users. The quality is a composite ranking of effectiveness, efficiency and user-friendliness. Consequently all the OER discoverable through a search engine can be easily compared on these two dimensions. If one is too difficult (high level) then a lower level OER can be selected. If one is too complex and not of expected quality then it can be downgraded, and another OER selected. For social tagging to work, the OER must require each user to click on each of the two rankings after using the OER.

The institutional role (and cost) is focused on collecting, and adding initial tags to each OER. If the OER is well localised eg translated into a local language suitable for a local curriculum, it may then be tagged as high quality for those students. A user studying a foreign topic may wish to import directly a globalised OER, or one localised to a region abroad, and cross-border access will be needed. It is not true that all users in one location will want only localised OER, so resources at all levels of localisation should be discoverable. Institutions need not spend so much time and money to localise every OER and then to ring-fence these with password-protection and fee-paying access to recover costs.

There are aspects to be tagged in each of the five domains of learning ;- the cognitive, metacognitive, affective/social, environment, and management domain (Zhang & Kawachi, 2011). Tags are needed in each of these five domains - briefly cognitive-difficulty, metacognitive-importance, affective-like, environment-format, and management-time (see for example Kipp, 2007).

Tagging is best done manually. However particularly with long duration resources such as video where tags can be inserted into the content at different places as bookmarks, the user may get tired and not fully tag all the resource. A semi-automatic method has been devised and suggested by Ballan et al. (2010) that uses a memory of tags used previously for similar image frames. This semi-automatic method is recommended for user generated
video resources such as on Flickr, Facebook, YouTube, and Vimeo. Such tagging could mean that in future countries need not block these types of OER learning resources.

An interesting study was reported recently by Popescu & Grefenstette (2010) that found that tags were inherently characterised by the author gender. One generally believes teachers to be gender neutral, although tutors know that gender differences exist among students, ways of thinking and talking, task preference, and strategies chosen. However, it now seems that further studies are warranted to see how users differ by gender in their choices of tags. They found 66% of users preferred to use tag-words that were gender sensitive, and that half of these preferred to use tag words of their own gender. This finding naturally leads to wondering if tag-words are age-related, and whether tag-words are prior-knowledge-related.

2.2 METHODS:
Prior Learning Assessment and Recognition (PLAR)

At the Open University of China, we have experimented with prior learning assessment and recognition (PLAR) methods, reported by Wang & Yin (2012). There are three types of PLAR: - Type-1 for prospective students to be allowed to register for a course; Type-2 for current students to avoid duplicating work-load to gain certification; and Type-3 mapping occupational skills as portfolio-needs analysis. In each of these some online assessment can play a role, notably in Type-3 in open and distance education.

Type-1 is traditionally used by open universities offered to persons having valuable experience without certificates and wanting to enroll in higher education. In such case the course tutor can become overloaded in trying to help weaker students. Type-2 is used more recently by all kinds of university offered to enrolled students who want to avoid duplicating coursework which they have already covered during work-related or independent learning outside the university (usually before enrolling). Certifying any person who has not sat through the coursework can be problematic. These are labelled Type-1 and Type-2 following the descriptions given by Sir John Daniel in Mandell & Travers (2012). Type-3 is the expansion of our skills profiling that we used in Type-2 PLAR, which is extended along the lines of occupational profiling suggested by Dickerson, Wilson, Kik & Dhillon (2012), to include the academic knowledge and skills in all five domains of learning reported by us in Zhang & Kawachi (2011). The five domains include the subject knowledge and skills in the cognitive domain, the motivations in the affective domain, self-awareness in the metacognitive domain, interdependence in the environment domain, and study skills in the management domain. Current research is expounding on the learning skills to extend occupational profiling to specific course levels in higher education.

2.3 METHODS:
Academic and Skills Profiling

Western governments are producing skills profiles for various occupations. Canada (2012) for example lists the skills together with the depth of complexity / knowledge in each, for 350 different occupations. They specifically indicate these can be used for recognition of foreign credentials http://www.rhcdc-hrsdc.gc.ca/eng/workplaceskills/credential_recognition/index.shtml to improve the integration of internationally trained workers into the domestic Canadian workforce. They also indicate that such profiling can promote job mobility http://www.rhcdc-hrsdc.gc.ca/eng/workplaceskills/labour_mobility/index.shtml. The Canadian government
goes further to indicate the national occupational analyses NOA “can be used to develop curricula in training institutions” http://www.red-seal.ca/w.2lc.4me@-eng.jsp?lang=eng providing a sample examination and the essential skills profile for hundreds of vocational occupations. For example they list the skills and level of complexity in each, for one job as shown in FIGURE 2 below.

In the United States, the government offers a template for skills profiling at http://www.acinet.org/skills for self-completion in which the user can select skills and rate each of them to create a take-away profile. The completed profile then compares your self-ratings against those required for jobs you select http://www.acinet.org/skills/PDF/COS_CareerTools_SkillsProf_Results.pdf. Although the comparison is very broad, the basic concept is sound. The technique could not only serve as a mechanism for reflective intrinsic motivation to improve, but also can indicate which jobs, courses, or level in a study course could be most suitable. The take-away profile can be re-accessed online and up-graded after further studying and skills acquisition.

In Britain, a wide variety of skilled people engage voluntary work, and an online self-assessment http://www.workingforacharity.org.uk/skills_profile helps with matching own skills and levels to the occupational requirements. Of particular concern may be the transfer of skills acquired during military service https://www.ctp.org.uk to civilian occupations.

FIGURE 2 : Detailed Skills Profiling can facilitate Job Mobility

There are few Asian countries engaging skills profiling for job mobility. However, the technique lends itself ideally to creating academic profiles for use in e-Type-3 PLAR, which will improve cross-border student (and teacher) mobility and job mobility - all at zero or very low cost.
Occupational skills profiling can easily be extended to academic knowledge and skills profiling covering all the content knowledge and skills across the whole five domains of learning. A visual form of the academic profile can be drawn as a two-dimension plot of complexity level on each item. The academic knowledge and skills profile will then have institutionally pre-set complexity levels (y-axis in FIGURE 3 plots) on each item (x-axis in FIGURE 3 plots) associated with the start of a course (offering easy Type-1 PLAR) and at the end of a course (offering easy Type-2 PLAR). In practice, e-Type-3 PLAR profiling should be text-based to allow for latent semantic analysis (LSA) search for suitable OER. However in these early pilot stages the graphical form may be more user-friendly and intrinsically motivating.

**FIGURE 3:** The System Design for e-Type-3 PLAR

Type-3 PLAR can be organised so that students and the wider public can self-evaluate themselves. This can be achieved more easily these days through using online computer-based technologies, and the resulting e-Type-3 PLAR can be offered freely, taking up only the time of the student or person interested in discovering their skills profile status. The interested person can do this to prepare well in advance an own profile that meets the institutionally pre-set levels in relevant education and skills. As shown in FIGURE 3 above, the student can overlay electronically his or her own profile to discover the fit with the target profile. The student not only can discover how and where to improve own skills to construct a better fit (getting self-motivation to learn), but also can gain confidence sufficient to justify paying for the institution to then review his or her profile and award PLAR credits accordingly. The institution only gets involved when the student has achieved a good fit, and submitted this for administrative checking, before involving expensive academic experts in the PLAR process.
3. RESULTS:
OER Use and Self-Assessment at No Cost

Higher education institutions around the world are facing the need to decrease costs - the only alternative is to increase tuition fees or to increase student enrollment. Currently the institution costs for performing PLAR are high (involving senior expert professors for many hours per student assessment) and little if any is recovered from the student (Type-2 PLAR) or prospective student (Type-1 PLAR). Any system for PLAR particularly on a massive scale must be low or zero cost. The e-Type-3 PLAR designed and suggested here not only offers zero cost to the institution but also operates to initiate the intrinsic motivation to learn. The negative-feedback loop reported in detail by Kawachi (2006) (given an opportunity and believing in a reasonable chance for success) in which the student compares her current status with a target status induces the emotion to act, and initiates the intrinsic motivations that are the most highly desirable for academic achievement and lifelong learning.

Another use of academic profiling is for intervention to prevent a student from dropping out. The student’s unique profile will naturally evolve over time as the student challenges learning over the years. Monitoring the development of the changes in the individual student’s profile - particularly against a profile of an average student - can help to predict dropping out and the specific education and training that is responsible.

Additionally the student profile is easily transmissible for cross-recognition elsewhere. One clear use for the profiles achieved by students will naturally be by future employers or current employers looking to promote the student. In this sense the academic profiles are matched with occupational profiles to see the fittingness. The e-Type-3 PLAR can promote horizontal and vertical mobility in labour at no extra cost.

4. CONCLUSION and SUGGESTIONS:
Tagging OER for Skills Profiling

The overarching issue for OER users is discovering good quality material at the appropriate level. Students particularly can benefit from knowing which OER are best suited to the purpose at hand. The findings here suggest that OER tagging for academic skills profiling will offer reduced costs and improve open access to higher education. Students adopting e-Type-3 PLAR - and regularly comparing their current status with a target status - will become intrinsically motivated to study. The whole e-portfolio profile system promotes the use of OER in higher education and for lifelong learning at very low cost, and moreover facilitates job mobility and cross-recognition abroad.

NOTES:
The powerpoint slides prepared for this presentation will be freely available from http://www.open-ed.net/library/oer-profiling.ppt
REFERENCES:


