Institute for Educational Cybernetics

Educational Cybernetics: Reports

University of Bolton *Year* 2008

Open Educational Resources - opportunities and challenges for higher education

Li Yuan* Sheila MacNeill†

Wilbert Kraan‡

*University of Bolton, l.yuan@bolton.ac.uk

†University of Strathclyde

‡University of Bolton

Open Educational Resources – Opportunities and Challenges for Higher Education

Li Yuan; Sheila MacNeill; Wilbert Kraan

JISC CETIS

1. Introduction

Higher education institutions around the world have been using the Internet and other digital technologies to develop and distribute teaching and learning for decades. Recently, Open Educational Resources (OER) have gained increased attention for their potential and promise to obviate demographic, economic, and geographic educational boundaries and to promote life-long learning and personalised learning. The rapid growth of OER provides new opportunities for teaching and learning, at the same time, they challenge established views about teaching and learning practices in higher education.

This briefing paper provides the background to the current development of and future trends around OER aimed at adding to our understanding, stimulating ongoing debate among the JISC community and developing a research agenda. The briefing is structured in three sections:

- Discussion on the conceptual and contextual issues of Open Educational Resources.
- A review of current OER initiatives: their scale, approaches, main issues and challenges.
- Discussion on trends emerging in Open Educational Resources, with respect to future research and activities.

2. Concept and Context of the Open Educational Resources (OER) Movement

2.1 The concept of "Openness" and the Open Initiatives

The concept of 'Openness' is based on the idea that knowledge should be disseminated and shared freely through the Internet for the benefit of society as a whole. The two most important aspects of openness are free availability and as few restrictions as possible on the use of the resource, whether technical, legal or price barriers. Openness exists in different

forms and domains and has different meanings in different contexts. For example, in the social domain it is fundamentally motivated by the expected social benefits and by ethical considerations related to freedom to use, contribute and share. Openness in the technical domain is characterised by access to source code and/or access to interoperability standards or the standards process. According to Tuomi (2006) a higher level of openness is

> about the right and ability to modify, repackage and add value to the resource. However, most existing initiatives offer the most basic level of openness - "open" means "without cost" but it does not mean "without conditions".

The definition of 'open' is constantly evolving and varies according to context e.g. sharing software source code, re-(using) content and open access to publications. The following well-known initiatives present important steps toward creating, sharing and reusing open source, learning objectives, research outcomes and encouraging and promoting the use of open licences.

- Open Source Initiative http://www.opensource.org/: During February 1998, Eric Raymond and Bruce Perens founded OSI, the Open Source Initiative, with the purpose of "managing and promoting the Open Source Definition for the good of the community, specifically through the OSI Certified Open Source Software certification mark and program". It is dedicated to promoting open source software for which the source code is published. This allows anyone to copy, modify and redistribute the code and its modifications without paying royalties or fees. The process is enabled and guaranteed by Open Source Licences which ensure that software licenses that are labelled as "open source" conform to existing community norms and expectations.
- Open Content Initiative http://www.opencontent.org/. Inspired by the success of Open Sources Initiative (OSI), David Wiley founded "Open Content Project" in 1998 (Wiley 2003) to popularise the principle of OSI for creatiing and reusing learning objectives and content. The first content-specific licence was created for educational materials and a key fundamental of Wiley's original licence is that any object is freely available for modification, use and redistribution with certain restrictions.
- Open Access Initiatives http://www.pubmedcentral.nih.gov/about/openaccess.html : The idea of Open Access is that scholarly work should be freely and openly available online with no unnecessary licensing, copyright, or subscription restrictions. Three key initiatives serve as milestones for the open access movement. In December 2001, the Open Society Institute organised a meeting in Budapest and the outcome of this

meeting was the Budapest Open Access Initiative (BOAI). The Budapest Initiative announced two strategies for open access – the establishment of open access journals and self-archiving by scholars of their work. In April 2003, a meeting at the Howard Hughes Medical Institute in Maryland resulted in the Bethesda Statement on Open Access Publishing - free access to scholarly journals. It provided a working definition of open access publishing and agreed a set of principles that all parties (scholars, research institutions, publishers and librarians) could adopt to 'promote the rapid and efficient transition to open access publishing'. In October of 2003, a conference at the Max Planck Society in Berlin resulted in the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. This states that progress should be made by encouraging researchers to publish their work according to open access principles and cultural institutions to provide their resources on the Internet.

- Creative Commons http://creativecommons.org/ - Creative Commons' first project, in December 2002, was the release of a set of copyright licences for public use. These machine-readable licenses are designed for websites, scholarship, music, film, photography, literature, courseware, etc and they help people make their creative works available to the public, retain their copyright while licensing them as free for certain uses, on certain conditions. ccLearn, the educational division of Creative Commons, was launched in 2007 and is dedicated to realizing the full potential of the Internet to support open learning. It is expected to further reduce barriers to sharing, remixing and reusing educational resources.

2.2 Defining Open Educational Resources

The term Open Educational Resources (OER) was first introduced at a conference hosted by UNESCO in 2000 and was promoted in the context of providing free access to educational resources on a global scale. There is no authoritatively accredited definition for the term OER at present; the most often used definition of OER is, "digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research" (OECD, 2007). With regard to this working definition, it is important to note that "resources" are not limited to content but comprise three areas, these are (OECD, 2007):

- *Learning content*: Full courses, courseware, content modules, learning objects, collections and journals.

- *Tools*: Software to support the development, use, reuse and delivery of learning content, including searching and organisation of content, content and learning management systems, content development tools, and online learning communities.

- *Implementation resources*: Intellectual property licenses to promote open publishing of materials, design principles of best practice and localise content. (OECD, 2007)

A wide variety of initiatives in higher education have crystallized around the above three areas - from institutions that publish the materials they use in their own teaching (e.g. syllabi, lecture notes, reading lists etc.), to projects that support the creation, provision and sharing of open content through developing software, standards and licensing tools or building communities of use.

2.3 Visions and goals

Although there is no comprehensive definition of OER there are many diverse goals for increased adoption and use of OERs. The Cape Town Open Education Declaration created a vision to promote open education 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…" To realize this vision, three strategies have been proposed in order to increase the reach and impact of open educational resources. These are:

- Encourage educators and learners to actively participate in the emerging open education movement. Creating and using open resources should be considered integral to education and should be supported and rewarded accordingly;
- 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.
- Governments, school boards, colleges and universities should make open education a high priority. Ideally, taxpayer-funded educational resources should be open educational resources. Accreditation and adoption processes should give preference to open educational resources.

The Declaration has already been signed by thousands of individuals and hundreds of organisations, includes learners, educators, trainers, authors, schools, colleges, universities, publishers, unions, professional societies, policymakers, governments, foundations around the world. As the OER movement grows, this idea will continue to evolve. It is necessary to further develop a shared vision and implementation strategies, especially around technology changes and teaching and learning practices.

2.4 Drivers/enablers, inhibitors

As with any other technology-related initiatives in education, OER is driven by technical, economic, social, policy and legal factors. Some of these factors provide either a favourable environment or a particular handle for bringing about changes and others may hinder a broader uptake of OER initiatives. OLCOS (2007) in OER Roadmap 2012 grouped the drivers/enables and possible inhibitors according to their assumed short to medium (until around 2009) or longer-term influence (until 2012) as the following:

Short-medium term (to 2009)

Drivers/enablers:

- International organisations' promotion and funding available
- Competition among leading institutions in providing free access to educational resources as a way to attract new students
- Success of open access initiatives and repository projects;
- Rapid development and wide use of Social Software tools and services and emergence of personal learning environment;
- Licensing open content will become easier as plug-ins for widely used authoring software packages become available.

Inhibitors:

- Growing competition for scarce funding resources
- Difficulty in finding a balanced approach to open and commercial educational offerings;
- Copyright issues

- Fears of low recognition for OA publications, particularly among young researchers
- Lack of policies for the development and use of repository at institutional level
- Lack of communication and cooperation between system and tool developers and educators;

Long-term (to 2012)

Drivers/enables

- Policies emphasise educational innovation and organisational change in educational institutions
- ICT-based lifelong learning and personalised learning needs
- Opportunities for co-operation and collaboration between institutions around the world
- Global competition in Higher Education and decline in student numbers in Europe due to demographic trends;
- Creative Commons licensing is firmly established and is being used increasingly.
- New systems for creating and handling group-based Learning Designs may become more widely used;
- Semantic applications will provide new ways to access knowledge resources.

Inhibitors

- Business models in OER will remain tricky
- Lack of institutional policies and incentives for educators to excel in OER
- Models that build on teachers in the creation and sharing of OER will need to invest considerable effort in training and support;
- Creation of educational metadata will remain costly
- Need more advanced tools and services for educational repository;

According to OLCOS (OLCOS, 2007), The drivers/enablers or inhibitors under the category short- to medium-term should indicate those already have observable influences, and may continue or gradually decline after 2009. However, those under the category longer-term do not mean that it will not have an influence by 2009, rather, the idea is that it will have an

influence over a longer period of time, and that this influence may be felt much more strongly after 2009.

3. Review of Open Educational Resources (OER) Initiatives in Higher Education[1]

3.1 Mapping OER and Featured OER Initiatives

Open Educational Resources (OER) initiatives aspire to provide open access to high-quality education resources on a global scale. From large institution-based or institution-supported initiatives to numerous small-scale activities, the number of OER related programmes and projects have been growing fast within the past few years. According to OECD (OECD, 2007), there are more than 3000 open access courses (opencourseware) currently available from over 300 universities worldwide.

- In the United States thousands courses have been made available by university-based projects, such as MIT OpenCourseWare, Rice University's Connexions project etc. (http://ocw.mit.edu/, http://cnx.rice.edu/)
- In China, 750 courses have been made available by 222 university members of the China Open Resources for Education (CORE) consortium. (http://www.core.org.cn/cn/jpkc/index_en.html)
- In Japan, more than 400 courses have been made available by 19 member universities of the Japanese OCW Consortium from its 19 member universities. (http://www.jocw.jp/)
- In France, 800 educational resources from around 100 teaching units have been made available by 11 member universities of the ParisTech OCW project. (http://graduateschool.paristech.org/)

The following are several well-known programmes and projects which illustrate different approaches, models and scales of current OER initiatives:

MIT OpenCourseWare (http://ocw.mit.edu) – the best-known example of OpenCourseWare sharing and the most copied institutional OER model - the publication on the Web of course materials used in MIT classroom teaching. MIT OCW aims to provide a snapshot of how a particular course is taught at a particular time. It offers lecture notes, problem sets, syllabi,

reading lists, tools and simulations as well as video and audio lectures. Approximately 1,800 courses are made available to educators and learners worldwide at no cost, so that they can draw on the materials for their own teaching and learning, use them as a curriculum and course planning tool, or as inspiration for their own open content initiatives.

OpenLearn initiative (http://openlearn.open.ac.uk/) – launched by the UK Open University to make a selection of their materials available worldwide for free use by anyone accessing the site and to build communities of learners and educators around the content using a range of tools and strategies. The OpenLearn initiative complements the MIT by providing not only a collection of free course material but also a set of tools to help authors publish and support collaborative learning communities. It is organised in two ways: the LearningSpace which offers 5400 learning hours of materials for learning and a LabSpace where content can be downloaded, re-mixed, adapted and reused.

USU OCW (http://ocw.usu.edu/) - Utah State University offers a collection of open educational resources used in their formal campus courses for faculty, students, and self-learners throughout Utah and around the world. The USU OCW also provides self - learners a variety of "credit by examination" options so that they can obtain college credit for what they have learned through using USU OpenCourseWare. The Center for Open and Sustainable Learning (http://cosl.usu.edu/) at Utah State University has developed an OCW development tool – eduCommons. It allows institutions to easily publish OCW content via a ready-made platform designed for efficient production of course materials. This model is also intended to provide an institution with the means to assure academic and pedagogical quality via two different digital course resource systems within a university: one built entirely of creative commons material, and another built within the IP environment of the institution's digital library/repository allowing access to copyright material only to authenticated members of the community. Open source software also designed by the centre to support learner communities using OCW and to provide educational support services.

Connexions (http://cnx.org/**)** – initially funded by Rice University, the Connexions attempts to bring the three strands of content, communities and software together in one intuitive and dynamic teaching and learning environment. It provides not only a rapidly growing collection of free scholarly material but also a set of free software tools to help authors publish and collaborate; instructors build rapidly and share custom courses; and learners explore the links among concepts, courses and disciplines. The Programme focuses on building and supporting

communities of digital object consumers and producers who credential material. Rice's Connexions project currently hosts 3,461 open learning objects available for mixing and matching into study units or full courses.

Open Learning Initiative (http://www.cmu.edu/oli/) started at Carnegie Mellon University. It was launched in the hope that online learning environments might constitute an alternative to traditional classroom teaching by promoting greater student-content interaction and by providing students with greater and more frequent feedback on their performance and understanding. The design of OLI courses has been guided by cognitive principles of learning that stress the importance of interactive environments, feedback on student understanding and performance, authentic problem-solving and efficient computer interface. OLI's complete courses have innovative features such as intelligent tutoring systems, virtual laboratories, group experiments and simulations and frequent opportunities for assessment and feedback. OLI is also about building a community that will play an important role in course development and improvement, which is fundamental to the future direction of open educational practice.

MERLOT (Multimedia Educational Resources for Learning and Online Teaching, http://www.merlot.org/merlot/index.htm) - has been developed by the California State University Centre for Distributed Learning. The MERLOT model also attempts to engage the user community in shaping the open content to apply to varied educational objectives. It is a user-centred, searchable collection of peer reviewed and selected higher education, online learning materials, catalogued by registered members and a set of faculty development support services. It has 15 discipline communities, two partner communities and one workforce community. All discipline communities have an editorial board for peer review. MERLOT uses community-building techniques and looks to original contributors, peer reviewers and the user community to keep online catalogues updated, fresh and vibrant. It contains links to more than 15,500 resources, which encompass simulations, animations, tutorials, drills and practices, quizzes and tests as well as lectures, case studies, collections, reference materials and podcasts.

OpenCourseWare Consortium (http://www.ocwconsortium.org/) - a collaboration of more than 100 higher education institutions and associated organisations from around the world creating a broad and deep body of open educational content using a shared model. Member institutions must commit to publishing, under the institution's name, materials from at least

ten courses in a format that meets the agreed definition of opencourseware. OpenCourseWare Consortium's model encourages institutions to be involved in some kind of established co-operation for sharing resources with others and to develop a common evaluation framework for all consortium members.

A variety of OER programmes and projects have been started in recent years. It is not possible to give a comprehensive estimation of the number of ongoing OER initiatives at the moment. However, it is possible to distinguish between different models of OER s that exist side by side, creating a kind of ecosystem to meet a variety of needs of teaching and learning in higher education.

3.2 Models for Open Educational Resources

Funding models from Downes (2006)

There are many funding models currently used by an open educational resource initiative. Downes (2006) summarised these models as follows:

Endowment Model – the project obtains base funding and a fund administrator manages this base funding and the project is sustained from interest earned on that fund. For example, the Stanford Encyclopedia of Philosophy, where funds were raised from a variety of charitable foundations, generating in interest the service's operating budget.

Membership Model – a coalition of interested organizations is invited to contribute a certain sum, either as seed only or as an annual contribution or subscription; this fund generates operating revenues for the OEM service. For example, the Sakai Educational Partners Program, is a for-fee community that is open to educational institutions.

Donations Model – a project deemed worthy of support by the wider community requests, and receives donations. Numerous open source and open content projects are funded in this manner, including Wikipedia and the Apache Foundation. Donations can take the form of money or content / code.

Conversion Model- by given something away for free and then convert the consumer of the freebie to a paying customer. This model has proven popular in the educational community, having been adopted by Elgg and LAMS .

Contributor-Pay Model – a mechanism that contributors pay for the cost of maintaining the contribution, and the provider thereafter makes the contribution available for free. For Example, the PLoS Open Access, research articles and supporting documentation will be made freely available online to view immediately upon publication. The charges for this process will be met by funding bodies.

Sponsorship Model – this model underlies a form of open access that is available in most homes: free radio and television. In online educational initiatives, various companies have supported OER projects on a more or less explicit sponsorship basis, often in partnership with educational institutions. Examples include the MIT iCampus Outreach Initiative and the Stanford on iTunes project.

Institutional Model - an institution will assume the responsibility itself for an OER initiative and the most well known of these is MIT's OpenCourseWare project.

Governmental Model – funding for OER projects are directly come from government agencies, including the United Nations.

Because OER initiatives have different goals and exist in different institutional contexts, no single funding model fit every project.

Different OER Models in Higher Education (Wiley, 2006)

Wiley (2006) summarised three models for open educational resource projects in higher education: the MIT model, the USU model, and the Rice model. These three models exhibit an instructive diversity in their size, organization, and provision of IP-clearance, content creation, and other services.

The MIT Model: this model is highly centralized and tightly coordinated in terms of organization and the provision of services, relying almost exclusively on paid employees. The goal of MIT OCW is to publish each and every course in the entire 1,800-course university catalogue in a fixed period of time, and to continually republish new versions of courses and archive older versions. MIT has made an institutional commitment to sustain the project over the long term. One the key drivers and enabler for the MIT project has been the lever of Foundation and private donor support it has been able to achieve. It has also successfully engaged vendors (such as Sapient, Microsoft, Maxtor, Hewlett-Packard,

Akamai, and NetRaker) in partnerships. The annual budgets for MIT OCW projected from 2007 through 2011 are over £ 2,155,000 per year, with the most resources allocated to staff (including eight core staff, five publication managers, four production team members, two intellectual property researchers, and ten department liaisons) technology and contracted services. Without significant external funding, it is unlikely that any other institution will be able to replicate the MIT model.

The USU Model: This model is a hybrid of centralization and decentralization of both organization and services, and work is distributed across some employed staff and a number of volunteers. The goal of USU is to publish as many of the courses in the USU course catalogue as possible. Faculty members volunteer to coordinate this work as part of their teaching or advising responsibilities by making USU OCW-related work eligible for credit in their courses. The USU has also acquired the William and Flora Hewlett Foundation support with more than £125, 300 over the life of the project. The annual projected budget for USU OCW in 2007 is just over £63,647 (including one full-time Director, two half-time graduate students, and three half-time undergraduates). It is likely that this model could be replicable by other universities.

The Rice Model: This model is almost fully decentralized and volunteers provide almost all services and materials. The goal of Rice Connexions is to enable the collaborative development of educational modules and courses by authors from around the world. There is no target number of courses to be developed and the courses and modules in Connexions are not all from courses taught at the Rice University. There is extensive documentation provided on the site to provide guidance for course building, technical and pedagogical support and to help authors deal with copy right issues. The average cost per course under the Connexions model appears to be extremely low. Most importantly, this model provides an example of volunteer-driven open resource communities that many other institutions could adopt and further explore.

The MIT, USU, and Rice models show much of the diversity possible in open educational resource initiatives in higher education from institutional course based to more community based bottom-up activities. There are also all kinds of in-between models forming a continuum. For any OER initiative there is no one-size-fits-all model. However the existing models provide a good basis for others to build on.

3.3 Motives for Providing, Producing and Using OER

The first and most fundamental question anyone arguing for free and open sharing of educational resources has to answer is – Why should anyone give away anything for free? What are the possible gains in doing that? The OECD (2007) conducted case studies at institutions with OER projects and a number of reasons for using and producing OER were presented. These are summarised as follows:

- The altruistic argument that sharing knowledge is in line with academic traditions and a good thing to do.
- Educational institutions should leverage taxpayers' money by allowing free sharing and reuse of resources.
- Quality can be improved and the cost of content development reduced by sharing and reusing.
- It is good for the institution's public relations to have an OER project as a showcase for attracting new students.
- There is a need to look for new cost recovery models as institutions experience growing competition.
- Open sharing will speed up the development of new learning resources, stimulate internal improvement, innovation and reuse and help the institution to keep good records of materials and their internal and external use.

From a more individual standpoint, open sharing is claimed to increase publicity, reputation and the pleasure of sharing with peers. According to OECD's study (OECD, 2007), the motives for individuals to become engaged in OER can grouped into four:

- The altruistic motivation of sharing (as for institutions), which again is supported by traditional academic values.
- Personal non-monetary gain, such as publicity, reputation within the open community (egoboost).
- Free sharing can be good for economic or commercial reasons, as a way of getting publicity, reaching the market more quickly, gaining the first-mover advantage, etc.

- Sometimes it is not worth the effort to keep the resource closed. If it can be of value to other people one might just as well share it for free.

Findings from the OECD research suggest that, the most commonly reported motive for lecturers was to gain access to the best possible resources and to have more flexible materials. It should also be emphasised that a combination of several of the motives listed here are likely to be in play simultaneously, both altruistic motives and economic incentives.

3.4 Outcomes and Some Lessons Learned

Although there is little qualitative or quantitative research data available for OER initiatives at the moment, some positive outcomes and impacts from individual projects have been reported. For example, MIT OpenCourseWare's evaluation report (MIT OpenCourseWare, 2006) indicates that MIT OCW has been visited more than 8.5 million in 2005, a 56% annual increase. MIT OCW use is centred on subjects which MIT is a recognised field leader. The data shows that 61% of OCW traffic is non-US, 49% of visitor identify themselves as self learners, 32% students and 16% educators. Educators come to the site primarily to develop a course (26%), prepare to teach a specific class (22%), and to enhance personal knowledge (19%). Student uses the website to complemente a course (38%), enhance personal knowledge (34%) and plan course of study (16%); Self learner uses it to enhance personal knowledge (56%), keep current in field (16%) and plan future study (14%). Similarly, Connexions is being used in traditional colleges, community colleges and primary and secondary school settings, in distance learning and by lifelong learners around the globe (UNESCO, 2005). Volunteers are translating modules and courses into a range of different languages, including Spanish, Japanese, Chinese and Thai. Some key lessons learned from these OER projects include:

Culture issues and localisation: OER projects are cultural as much as they are educational, in that they give users "an insight into culture-specific methods and approaches to teaching and learning" – a practical exposure to the way that courses are 'done' in another country or by another instructor. The conditions under which OER are created, the languages used and the teaching methodologies employed result in products that are grounded in and specific to the culture and educational norms of their developers. Localising OER material is not only a question of language but also one of culture. It is important to be aware of cultural and

pedagogical differences between the original context of use and the intended new use of the material.

Incentives for faculty members: The greatest concern is the time that is required from academics to prepare elements of a course that will be available, monitored, maintained, updated and perhaps re-formulated for new settings and different uses. With little or no institutional or peer recognition or encouragement, there is little incentive for faculty members to take on the extra burden of developing and refining OER content. The creation of OER should be viewed not as an additional burden but rather as an integrated part of the scholarly endeavour that is useful, first and foremost, to a faculty member's own teaching, scholarship and career.

User support and experience: There is little data and research available on the user experience with OER. Systematic research of user behaviours and use patterns would help the field develop better tools to support use and reuse the content. For example, OERs are designed specifically for reusing teaching materials and self – learning, it is important that user support systems should be built into the resources themselves and develop self-supporting online user communities. The OpenLearn project is beginning to collate findings in this area.

3.5 Major Challenges

OER programmes and projects have generated considerable enthusiasm from governments, funding bodies, institutions, organisations and individuals. The spread of Open Educational Resources creates substantial educational opportunities, but also reveals challenges that require further work in order to reach their full potential.

Sustainability

As with any fixed-term, externally funded initiative, the maintenance and sustainability of OER is becoming a significant challenge. According to Wiley (2006), the sustainability of OER initiatives must be considered in two parts: the sustainable production of OER and the sustainable sharing of resources. The sustainability of any OER initiative is influenced by the size of the operation (small or large), the type of provider (institution or community) and the level of integration of users in the production process (co-production or producer-consumer model). There are many funding models in the different institutional contexts, however, every

initiative will have different goals so no single model will fit every project. Atkins (2007) has identified a number of approaches to sustainability which should be considered and need to be explored:

- Encourage institutions, rather than just individual pioneer-faculty, to buy into the OER movement so that institutional resources will be committed to sustain it.
- Situate OER collections not as distinct from the courseware environment for the formally enrolled students but as a low marginal cost derivative of the routinely used course preparation and management systems.
- Encourage membership-based consortia to share cost and expertise.
- Explore roles for students in creating, enhancing and adopting OER.
- Consider a voluntary (or mix of voluntary and paid) wiki-like model, in which OER is the object of micro-contributions from many.
- Examine ways that social software can be used to capture and structure user commentaries on the material.

There is growing interest in community-based approaches to produce content and promote sharing and use of resources. To make OER initiatives work and keep them for the long run, it is important to first gain and maintain a critical mass of active, engaged users, increase usability and improve quality of the resources created. The "community" offers possibilities for rapid diffusion and a strong community influences user behaviour and increases the likelihood that users will come back to the repository. OER should not only pay attention to the "product" but on understanding what its user community wants and on improving the OER's value for various user communities.

Intellectual Property and Copyright Issues

Intellectual property issues are at the heart of OER. It was suggested that the issue of copyright and ownership of material is "the root cause of slow development in this field," inhibiting some faculty members and institutions from making more educational content available to the online community. Before publishing educational resources that make use of third-party materials on the Internet, the author, or the publisher, must ensure they have the right to use these materials. There are several barriers raised by copyright to the use and production of open educational resources as follows (OECD, 2007):

- Practical difficulties for obtaining rights, such as whether a licenses is applicable or not, sometimes requires sophisticated legal analysis; it is not always easy to locate the appropriate license holder, which can be very expensive for the OER initiative. The difficulties and costs related to rights clearance for use of third-party content are considerable, in some cases almost half of the cost of the whole initiative.
- The issue of unintended incompatibility between materials or tools licensed under different licenses, or different versions of the same licenses, is becoming a key issue. Like technical interoperability, increased legal interoperability is of fundamental importance for the growth of the OER movement.
- Low awareness among teachers and researchers producing learning resources of permit controlled sharing, with some rights reserved to the author. Although many academics are willing to share their work, they often hesitate to do so in this new environment for fear of losing their rights to their work. The opposite of retaining copyright is to release work into the public domain, in which case the author retains no rights and anyone can use the material in any way and for any purpose.

To help address issues such as this and many more, the Creative Commons has launched a new division - Learning Commons, which focuses specifically on education. The mission of Learning Commons is to break down the legal, technical, and cultural barriers to a global educational commons. Learning Commons will provide advice and expertise to the OER community to overcome technical and cultural obstacles and identify lessons learned.

Quality Assessment and Enhancement

The rapidly growing number of learning materials and repositories makes the issue of how to find the resources that are most relevant and of best quality a pressing one. There are several alternative ways of approaching quality management issues which have been used:

- Institution-based approach: this is to use the brand or reputation of the institution to persuade the user that the materials on the website are of good quality, such as the OCW initiatives and UK Open University's OpenLearn initiative. Institutions most probably use internal quality checks before they release the courses, but these

processes are not open in the sense that users of the resources can follow them. The major challenge here is how the use of open educational material might constantly improve the material through reflected use.

- Peer review approach: This is one of the most used quality assurance processes in academia. As well as being well-known and well-used in Open source software projects (to review the code delivered by community members) and Open access journals (to decide which articles should be published), it could also be used for OER to guarantee the quality of a repository's resources. It is necessary to make review decisions credible, and peer review according to agreed criteria is well suited to that purpose.
- Open Users Review Approach: This is a kind of low-level or bottom-up approach, letting individual users decide on whatever grounds they like whether a learning resource is of high quality, useful or good in any other respect. This can be done by having users rate or comment on the resource or describe how they have used it, or by showing the number of downloads for each resource on the website, such as Rice University's Connexions project.

The quality of Open Educational resources can be improved through a centrally designed or decentralised process and the process may be open or closed. All these approaches can be used separately or dominated, depending on which kind of OER initiative or programme is being considered.

Interoperability

The concept of OER builds heavily on the idea of reusing and repurposing materials created somewhere else by someone else. Therefore, interoperability is a key issue. Learning resources need to be searchable across repositories, and it must be possible to download, integrate and adapt them across platforms. The lack of good faith implementations of interoperability standards in VLEs means that many resources produced by one educational institution will not be able to be exported or imported easily into other systems. Open standards foster interoperability, allowing disparate devices, applications and networks to communicate. A number of standards and specifications including IMS and SCORM, have been developed to enable interoperability, accessibility and reusability of web-based learning content

While these specifications help achieve re-use of content, they are not intended to help modification of content. For that aspect, the use of standardised content formats such as DocBook, TEI or DITA could be of value. Simple and well structured HTML could be particularly useful for this purpose, particularly because an increasing number of user friendly tools such as wikis allow educators to edit content directly.

4. OER - Calls for research, actions and the future

Higher education institutions worldwide face significant challenges related to providing increased access, while containing or reducing costs. Meeting increasing and increasingly varied demand for quality higher education is an important consideration in the policy debate and institutional development in many countries. OER is itself one of these challenges, but may also be a sound strategy for individual institutions to meet them. Inevitably, in a few years, OER could be replaced by new initiatives, even though, what is being done today or is trying to be done for the OER could be a guidepost for future initiatives towards the goal of enhancing life-long learning and personalised learning in the information society.

4.1 Policy concerns

There are a variety of policies that can enable or hinder the work of open educational resource projects. It is therefore necessary that governments and institutions should review and develop policies that foster openness and access. Polices should be adopted that enable or encourage in the creation, sharing and provision of educational resources.

The policy issues raised by OER are interlinked with general organisational, cultural and pedagogical issues within an institution. It is generally agreed that OER is primarily an institutional innovation, not a technical one. However, institutions do need to have a well-reasoned ICT strategy and clear e-learning policies in order to adequately deal with the opportunities (and threats) posed by the OER movement. There will be the need for many more institutional innovations in order to promote a culture of sharing and re-using content within the institution. The following areas should be addressed:

- Curriculum development
- Financial support
- Intellectual property

- Culture of sharing
- Assessment and accreditation
- Quality assurance
- Staff development
- Student support
- Technical infrastructure/software
- Institutional model

4.2 Social, culture and pedagogical concerns

From a social and pedagogical perspective OER could support lifelong learning and personalised learning, therefore, it is important to explore how learning takes place within the framework of OER. It was predicted that the emergence of personal learning environments will move the power over learning from the institutions, to individual learners. Learning is a social process based on ongoing communication, exchange of ideas and opinions and the reconsideration and reworking of study results. In this context, teaching and learning material is not necessarily created by one teacher or even by a teacher at all; learners should be actively involved in the process of designing curricula and syllabi and in the creation of knowledge. The development of using OER implies support for an open curriculum where learners have the flexibility to select a range of individual units/courses to suit their personal needs for the development of expertise. An increase in non-formal and informal learning can be expected to enhance the demand for assessment and recognition of competences gained outside formal learning settings. If so, issues of recognition and accreditation will be of growing importance. This may need a competency-based educational framework. An alternative way to provide evidence of learners' achievement is to create an "assessment on demand" option where students have free access to OCW, free access to volunteer tutors and gain credit on-demand from providing institutions (for example, USU OCW' s "credit by examination" option for self-learners). Credits earned in this way from various institutions would be aggregated by a new mechanism that would award accredited degrees and could leverage online learning using OER.

Community building is becoming an important theme in open educational resource initiatives. In fact, the notion of Community of Practice implies that members of such communities, who are interested in certain subjects and opportunities for collaborative

teaching practice and learning activities, want to further develop an understanding of certain issues and resources such as tools and content. Therefore, embedding the development of content in a community of practice is a key way to ensure that OER are relevant to the practice of learning and teaching. Simply providing access to databases of content will not encourage communities to become involved in the OER movement. Giving recognition and support to existing communities of users at the right time could provide the most powerful intervention in terms of sustainability of any OER funded initiative. Many useful tools and services are available which could make it easier to set up and support such learning communities. The exisiting community-driven nature of the OER movement is evidence of possibilities for transformation towards a new culture of learning.

4.3 Technical concerns

A new education paradigm will appear only when social, organisational and cultural issues are resolved in tandem with creating technology-based services. Core to technical innovations in OER is the need to simplify the user experience across the entire range of OER activities, from access to use to reuse and creation. Therefore, it is important to provide flexible, extendable platforms and easily adaptable open tools to access, use, reuse, create and post content to the Web. For that reason, much of the OER motive is about evolving infrastructure for enhanced content creation and use of infrastructure for accessing digital content.

The William and Flora Hewlett Foundation proposes an Open Participatory Learning Infrastructure (OPLI) which comprise a set of organisational practices, technical infrastructure, and social norms that collectively provide for the smooth operation of high-quality open learning in distributed, distance-independent ways. The proposed OPLI seeks to enable a decentralised learning environment that:

- permits distributed participatory learning;
- provides incentives for participation (provision of open resources, creating specific learning environments and evaluation) at all levels; and
- encourages cross-boundary and cross cultural learning.

An OPLI platform should include at least three types of activities:

- creating and providing infrastructure;

- meaningful and transformative use of the infrastructure; and
- discovery and transfer of the fruits of relevant research into future generations of the infrastructure.

Infrastructure building is a dynamic process; from technology–based services, various systems merge to allow dissimilar systems to be linked into networks. In this process, standardisation and inter-organisational communication techniques are critical. It is important to devise a compatible infrastructure so that there is ready transferability between the system provider, content creator and the user. Through the development of a service oriented infrastructure in parallel with other tools and resources so that lectures and learners can participate, contribute and share thoughts, resources and experiences.

The new set of low-barrier and easy-to-use social software tools and service which promote connections, exchanges and collaboration among people who share common goals and interests provide opportunities for OER innovation. For example, the widespread use of blogs, wikis, various mashups, podcasting and mobile devices among other emerging technologies beyond the educational sector has attracted the interest of many educators who are striving to innovate educational practices. Web-savvy students are already integrating such tools and services to run personal environments for study as well as various social activities. The growing social learning toolset lends itself to inventiveness among its users - involving a do-it-yourself (DIY) spirit. It is important to keep track of the developments of social software tools and how they could complement OER innovations.

5. Conclusion and Further Discussion

Although there are a growing number of OER initiatives and more and more institutions and individuals are sharing their digital learning resources over the Internet freely and openly, many fundamental questions still remain. Not least of which are the drivers for people, institutions and funding bodies. There is a need for further discussions and a deeper exploration of a number of issues in this context:

How institutions could be best supported in accelerating the organisational and cultural changes that are both needed and may be inevitable if OER approaches are to become embedded. How should institutions take account of the implications of OER for learning and teaching and new methods of assessment and accreditation in particular?

Building and enhancing existing communities appears central to the development of the educational paradigm of the open content movement. Developing open and sustainable communities of practice should be central to any OER funding model. These communities should not develop in isolation from existing communities rather they should enhance and build on established, effective networks. The successful management of this process is a key challenge.

Copyright and IPR issues continue to dominate any projects creating and re-using content. Institutions should be encouraged to develop policies which encourage staff (and students) to make their teaching and learning content discoverable, sharable, portable and re-usable.

As discussed earlier in this paper, there are a number of established models and communities in the open educational content movement. However there is a lack of research evidence relating to the effectiveness and sustainability of these models. Any funding of OER should include parallel research studies to support communities, validate processes and enable the sharing of best practice and inform future developments.

As with the OSS and OA movement, a continuing and growing debate within the OER movement can be anticipated. It seems impossible to really understand the significance of the OER movement by simply examining what it does. Its significance lies in what it is trying to achieve and the way in which it attempts to achieve it. There is a need for institutions, organisations and governments to share common interests and innovative approaches in providing open access to educational material, thereby achieving economic efficiency and raising the quality of teaching and learning in Higher Education through a global endeavour.

References:

Atkins, D, E.; Brown, J, S. and Hammond, A, L. (2007), *A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges and New Opportunities,* http://tinyurl.com/2swqsg

Downes, S. (2006) *Models for Sustainable Open Educational Resources*, National Research Council Canada, www.oecd.org/document/32/0,2340,en_2649_33723_36224352_1_1_1_1,00.html.

Geser, G (2007), *Open Educational Practices and Resources - OLCOS Roadmap 2012,* http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf

MIT OpenCourseWare (2006), *2005 Program Evaluation Findings Report, http://ocw.mit.edu/ans7870/global/05_Prog_Eval_Report_Final.pdf*

OECD (2007), *Giving Knowledge for Free: the Emergence of Open Educational Resources,* http://tinyurl.com/62hjx6.

UNESCO (2005), *Open Content for Higher Education,* http://www.unesco.org/iiep/virtualuniversity/media/forum/oer_forum_session_2_note.pdf

Wiley, D. (2006a) The Current State of Open Educational Resources, www.oecd.org/document/32/0,2340,en_2649_33723_36224352_1_1_1_1,00.html.

Wiley, D. (2006b) *On the Sustainability of Open Educational Resource Initiatives in Higher Education*, www.oecd.org/edu/oer.

---

[1] The details on each initiative have been mainly sourced from the relevant websites and have not been individually critiqued.

Appendix

Examples of Open Educational Resources Initiatives

One of the important and challenging tasks with respect to the open education resources movement, is figuring out who is involved and what they are doing. The growing list of OER initiatives below are just a small sample of the many HEIs, organisations and individuals worldwide who are committed to providing and promoting open education to the global teaching and learning community.

6. Large Institution-based OER initiatives	
MIT OpenCourseWare http://ocw.mit.edu	MIT OpenCourseware is the best-known example of open courseware sharing and is the most copied institutional OER model, providinghe publication on the Web of course materials used in MIT classroom teaching. MIT OCW aims to provide a snapshot of how a particular course is taught at a particular time. It offers lecture notes, problem sets, syllabi, reading lists, tools and simulations as well as video and audio lectures. Approximately 1,800 courses are made available to educators and learners worldwide at no cost, so that they can draw on the materials for their own teaching and learning, use them as a curriculum and course planning tool, or as inspiration for their own open content initiatives. MIT's OpenCourseWare is noteworthy in its scale, completeness, quality, and positive influence on others, however, it is basically a of high-quality, pre-credentialed, static material. Some universities have followed MIT's example, but are choosing to focus on specific subject areas to make available as open content, including agricultural engineering, public health, dentistry, instructional technology, and many others.
OLI http://www.cmu.edu/oli/index.html	The Carnegie Mellon Open Learning Initiative was launched in the hope that online learning environments might constitute an alternative to traditional classroom teaching by promoting greater student-content interaction and by providing students with greater and more frequent feedback on their performance and understanding. The design of OLI courses has been guided by cognitive principles of learning that stress the importance of interactive environments, feedback on student understanding and performance, authentic problem-solving, and a efficient computer interface. OLI's complete courses have innovative features such as intelligent tutoring systems, virtual laboratories, group experiments and simulations and frequent opportunities for assessment and feedback. OLI is also to build a community that will play an important role in course development and improvement, which is fundamental to the

	future direction of open educational practice. The OLI is more explicitly learner oriented than the other models; indeed the project can be seen as a testing ground for exploring how best to use available technologies to improve learning outcomes.
OpenER http://www.ou.nl/eCache/DEF/36.html	Open Universiteit Nederland is working on the OpenER project to introduce OER to Dutch higher education by focusing on high-quality, independent self-study learning materials in an open resource format.
OpenLearn http://openlearn.open.ac.uk/	The OpenLearn initiative has been Launched by the UK Open University to make a selection of their materials available worldwide for free use by anyone accessing the site and to build communities of learners and educators around the content using a range of tools and strategies. The OpenLearn initiative complements the MIT by providing not only a collection of free course material but also a set of tools to help authors publish and support collaborative learning communities. It is organised in two ways: the LearningSpace which offers 5400 learning hours of materials for learning and a LabSpace where content can be downloaded, re-mixed, adapted and reused.
SOFIA http://sofia.fhda.edu/	The Sofia (Sharing of Free Intellectual Assets) initiative was launched by Foothill-De Anza Community College District in March of 2004. The goal of Sofia is to publish community college-level course content and make it freely accessible on the web to support teaching and learning. Sofia provides a vehicle for faculty to share their intellectual assets, gain wide recognition for their contribution to their profession, and play a key role in improving equal access to educational materials beyond their classes. In addition to the valuable contributions by faculty, reviewers, instructional designers, accessibility specialists, and many other individuals with specific skills and roles round up the Sofia team and contribute to the realization of the project's objectives.
Open.Michigan https://open.umich.edu/	an initial sampling of University of Michigan course materials, software tools, and student work. These resources are offered openly and freely for use and re-use, allowing you to explore, build and redistribute educational content.

Open Yale Courses http://oyc.yale.edu/	Open Yale Courses provides free and open access to a selection of introductory courses taught by distinguished teachers and scholars at Yale University. The aim of the project is to expand access to educational materials for all who wish to learn. Taking as its starting point ongoing initiatives at peer institutions to distribute course syllabi, lecture notes, and reading assignments online, Yale's resources will centre on the actual lectures delivered in Yale College courses. The Centre for Media and Instructional Innovation (CMI2) at Yale University has begun to produce video lectures of seven Yale College courses for free distribution on the Internet. Translation of lecture transcripts into several foreign languages is included in the project's long-term goals.
7. Community (or Consortium) –based OER initiatives	
Connexions project **http://cnx.org/**	Rice University's Connexions project is designed to bring the three strands of content, communities and software together in one intuitive and dynamic teaching and learning environment. It provides not only a rapidly growing collection of free scholarly material but also a set of free software tools to help authors publish and collaborate; instructors build rapidly and share custom courses; and learners explore the links among concepts, courses, and disciplines. The Programme focuses on building and supporting communities of digital object consumers and producers who credential material. It provides a model for collaboratively developing, freely sharing and rapidly publishing scholarly content on the Web. Rice's Connexions project currently hosts 3,461 open learning objects available for mixing and matching into study units or full courses.
CORE http://www.core.org.cn/cn/jpkc/index_en.html	The China Open Resources for Education (CORE) consortium is committed to providing Chinese universities with free and easy access to global open educational resources and prompting closer interaction and open sharing of educational resources between Chinese and international universities, which CORE envisions as the future of world education.. It began with 26 IET Educational Foundation

	member universities and 44 China Radio and TV Universities to bring MIT Courseware to China in 2003. Around 750 courses have been made available from its 222 university members.
IREL-Open http://www.irel-open.ie/	In 2007, Irish universities received government funding to build open access institutional repositories and to develop a federated harvesting and discovery service via a national portal. It is intended that this collaboration will be expanded to embrace all Irish research institutions in the future. This is the collaborative workspace of the IREL-Open Project Working Group which is tasked with building a federated open access repository service for Ireland. It provides cross-searching Irish university open access repositories using the Google Custom Search Engine.
JOCW http://www.jocw.jp/index.htm	Japan Opencourseware Consortium(JOCW) was established in 2006. Around 400 courses have been made available by 19 member universities. The main components include: Syllabus, Calendar, Lecture Notes, Readings, Assignments, Exams. Some Universities also provide video or audio presentations of lectures (including pod casting). Materials provided through JOCW sites may be freely used, copied, distributed, translated and edited but only for nonprofit educational purposes. No pre-registration and no application process is required for use.
MERLOT http://www.merlot.org/merlot/index.htm	Multimedia Educational Resources for Learning and Online Teaching has been developed by the California State University Center for Distributed Learning. MERLOT attempts to engage the user community in shaping the open content to apply to varied educational objectives. It is a user-centred, searchable collection of peer reviewed and selected higher education, online learning materials, catalogued by registered members and a set of faculty development support services. It has 15 discipline communities, two partner communities and one workforce community. MERLOT uses a community-building technique which looks to original contributors, peer reviewers and the user community to keep online catalogues updated, fresh and vibrant. It contains links to more than 15,500 resources, which encompass simulations, animations, tutorials, drills and practices, quizzes and tests as well as lectures, case studies, collections, reference materials and podcasts.

NROC http://www.montereyinstitute.org/nroc/	Monterey Institute for Technology and Education National Repository of Online Courses (NROC) is a growing library of high-quality online courses for students and faculty in higher education, high school and Advanced Placement Courses in the NROC library are contributed by developers from leading online-learning programs across the US and designed to cover the breadth and depth of topics based on generally accepted US curricula. They can also be customized within a course management system. NROC is in partnership with academic institutions, publishers, teaching organizations, US state and federal agencies, international distributors and others to create a global distribution network to provide courses to students, teachers and the general public at little or no cost. NROC Licenses are content use arrangements for commercial vendors, textbook publishers, and charitable organizations.
ParisTech OCW http://graduateschool.paristech.org	The 11 ParisTech engineering institutions launched an ambitious project in November 2003, aiming at making available some of their educational resources (lecture notes, exercises, yearly archives, simulations, animations, course notes and videos). One target of this project is to promote high quality teaching provided by those institutions, in order to attract foreign students. Another goal of the project is to contribute to bridging the digital divide by making available Open Access Educational Resources, in accordance with the recommendations of the World Summit on the Information Society (WSIS). Around 800 educational resources from more than 100 teaching units have been made available by its member universities of the ParisTech OCW
OpenCourseWare Consortium http://www.ocwconsortium.org/	The OpenCourseWare Consortium is a collaboration of more than 100 higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model. Member institutions must commit to publishing, under the institution's name, materials from at least ten courses in a format that meets the agreed definition of opencourseware. OpenCourseWare Consortium's model encourages institutions to be involved in some kind of established co-operation for sharing resources with others and to develop a common evaluation framework for all consortium members.
World Lecture Hall http://web.austin.utexas.edu/wlh/	World Lecture Hall is a project of the Centre for Instructional Technologies at the University of Texas at Austin. This project publishes links to pages created by faculty worldwide who are using the Web to deliver course materials in any language. Some courses can be accessed full text. Materials

	include syllabi, course notes, assignments, and audio and video streaming. WLH contains links to course materials for university-level courses. WLH has been chosen as a Featured Top Site by Educating.net, the Internet's premiere education portal.

8. Specialised OER Initiatives

Exploratories http://www.cs.brown.edu/exploratories/about/home.html	This is a project of Brown University's Computer Graphics Research Group to create a set of exemplary Web-based learning objects (Java applets) that teach concepts in introductory computer graphics at the college and graduate level. Learning objects are characterized by their flexibility, interactivity, hypertextual curriculum frameworks, and use of explorable 2D and 3D worlds. Users can download complete Java applets, or build their own from the components collection. The project also publishes the results of its research into creating useful learning objects, and is working toward the creation of a complete Design Strategy Handbook.
Harvard's Open Collections Program (OCP) http://ocp.hul.harvard.edu/	Through Harvard's Open Collections Program (OCP), the University advances teaching and learning on historical topics of great relevance by providing online access to historical resources from Harvard's renowned libraries, archives, and museums. OCP's highly specialized "open collections" are developed through careful collaborations among Harvard's distinguished faculty, librarians, and curators. Three open collections have been launched since 2004: Women Working, 1800-1930, Immigration to the United States, 1789-1930, and Contagion: Historical Views of Diseases and Epidemics. Two additional collections are under development now: the Islamic Heritage Project, and Organizing Our World: Sponsored Exploration and Scientific Discovery in the Modern Age.

JHSPH OCW http://ocw.jhsph.edu/	The Johns Hopkins Bloomberg School of Public Health's OpenCourseWare (OCW) project provides access to content of the School's most popular courses. It provides free, searchable, access to JHSPH's course materials for educators, students, and self-learners around the world.
9. Public OER Initiatives	
CKAN http://ckan.net/	CKAN is the Comprehensive Knowledge Archive Network. It is the place to search for open knowledge resources as well as register your own. CKAN has a wiki-like interface that lets anyone add and correct packages. CKAN is developed and maintained by the Open Knowledge Foundation. Both the CKAN code and data are open: free for anyone to use and reuse.
EOL http://www.eol.org/	The Encyclopedia of Life (EOL) is an ambitious, even audacious project to organize and make available via the Internet virtually all information about life present on Earth. At its heart lies a series of Web sites—one for each of the approximately 1.8 million known species—that provide the entry points to this vast array of knowledge. Comprehensive, collaborative, ever-growing, and personalized, the Encyclopedia of Life is an ecosystem of websites that makes all key information about all life on Earth accessible to anyone, anywhere in the world.
OER Commons http://www.oercommons.org/	OER Commons is a teaching and learning network launched by The Institute for the Study of Knowledge Management in Education in US. It offers a broad selection of high-quality Open Educational Resources that are freely available online to use and, in most cases, to adapt to support individualized teaching and learning practices. It is the first comprehensive open learning portal where teachers and professors (from pre-K to graduate school) can access their colleagues' course materials, share their own, and collaborate on affecting today's classrooms. It uses Web 2.0 features (tags, ratings, comments, reviews, and social networking) to create an online experience that engages educators in sharing their best teaching and learning practices.

UniversitySurf http://icb.u-bourgogne.fr/universitysurf/en/index.html	UniversitySurf offers free access to a selection of 1500 online courses in the French language.. The teaching courses or resources come from 90 French Universities, French-speaking Universities outside of France and many personal sites of teachers.
Wikiversity http://en.wikiversity.org/wiki/Wikiversity:Main_Page	Wikiversity is a community for the creation and use of free learning materials and activities. Wikiversity is a multidimensional social organization dedicated to learning, teaching, research and service. Available in Dutch, French, Spanish, and English there are 7,830 content pages and 21,535 registered users
10.OER Tools and Services	
AEShareNet http://www.aesharenet.com.au/	AEShareNet is a collaborative system to streamline the licensing of intellectual property so that Australian learning materials are developed, shared and adapted efficiently. There are two ways to connect people: firstly, using Instant Licences, which are freely available, when you attach a relevant Mark; or alternatively, through Mediated licences, which are transacted online through the AEShareNet Service.
ccLearn http://learn.creativecommons.org/	ccLearn is a division of Creative Commons which is dedicated to realizing the full potential of the Internet to support open learning and open educational resources (OER). It is to minimize barriers to sharing and reuse of educational materials — legal barriers, technical barriers, and social barriers. ccLearn will leverage the unique capacity of Creative Commons that popularizes the resources that already exist and brings new communities and groups into the world of open learning.
Creative Commons http://creativecommons.org/	The Creative Commons is an initiative that facilitates the development and use of OER.. This project was developed by lawyers to addresses the issue of Intellectual Property Rights and offers a flexible copyright for creative work. It provides infrastructure, services and free tools that let

	institutions, educators and learners easily produce and create open educational resources and open educational practice with the freedoms they want it to carry.
COSL http://cosl.usu.edu/	The Centre for Open and Sustainable Learning at Utah State University has developed a social software tool – Open Learning Support – to support learner communities using OCW, and also an OCW development tool – eduCommons. It provides an example of using social software to form communities of learners around open content, where individuals can connect to share, discuss, ask, answer, debate, collaborate, teach, and learn. This model is also intended to provide an institution with the means to assure academic and pedagogical quality via two different digital course resource systems within a university: one built entirely of creative commons material, and another built within the IP environment of the institution's digital library/repository allowing access to copyright material only to authenticated members of community.
Eduforge http://eduforge.org/	Eduforge is an open access environment designed for the sharing of ideas, research outcomes, open content and open source software for education. Users are welcome to access their community resources or start their own project space. It is possible to explore, test, and create in EduForge's Toolbox environment, and to create content using their eXe (eLearning XHTML Editor Project) off-line authoring environment.
EduTools http://www.edutools.info/index.jsp?pj=1	WCET's EduTools provides independent reviews, side-by-side comparisons, and consulting services to assist decision-making in the e-learning community. Their Online Course Evaluation Project (OCEP) provides access and functionality to give users of this content an effective tool to search and compare course evaluations.
Google OCW http://opencontent.org/googleocw/	A search tool for a federated search of all OCWs and various other collections.

iTunes U http://www.apple.com/education/itunesu_mobilelearning/itunesu.html	iTunes U puts the power of the iTunes Store to work for colleges and universities, so users can easily search, download, and play course content just like they do music, movies, and TV shows. iTunes U contains free audio & video downloads from universities across the United States including Stanford, Duke, MIT, Arizona State. More European universities are now joining and putting lectures on iTunes, such as University College London, the Open University and Trinity College Dublin
LOAZ http://www.loaz.com/	Learning Object Authoring Zone (LOAZ) focuses on providing educators and learners with the most up-to-date resources on learning object creations. It provides an easy to use, web based, cheap (often free of cost) application that empowers non-technical subject matter experts to create interactive, multimedia based learning objects through step-by-step procedures and guidelines.
dScribe https://open.umich.edu/projects/oer.php#dscribe	The dScribe (digital and distributed Scribes) is a student-centric OER publishing system developed by the University of Michigan. It leverages the existing student-faculty relationship to gather, vet, and publish course material on an OER website. The dScribe project establishes a powerful new participatory paradigm in higher education by involving students in an active teaching and learning process. This process is being developed to be portable and adaptable, and could offer institutions worldwide with a set of tools to sustain a grassroots OER effort.