Analysis of Existing European Practice and Principles in Development of Open Educational Resources (OER)

DEV 1.1

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Blending academic and entrepreneurial knowledge in technology enhanced learning

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Glossary of Terms

OER - Open Educational Resources

Any teaching, research and learning materials available from the public domain that have been released under an open source licence which permits their free use, access, repurposing, reuse and redistribution by others with limited or no restrictions.[1]

OCW - OpenCourseWare

OpenCourseWare (OCW) is an open digital publication of university-level educational resources that are available free of charge. The materials, which are organized into courses, often contain course planning materials, evaluation tools and thematic content, as well. While OCWs do not offer complete courses, they do provide users with resources that are under Creative Commons licenses, allowing the use, reuse and distribution of the materials.[2]

MOOC - Massive Open Online Course

MOOCs (Massive Open Online Courses) are freely available online courses without the requirement of a formal entry or participation limit. While they do offer interaction, feedback and assessment through automated quizzes or peers, they currently do not award credits or give official credentials.[2]

1 Introduction

The current global economic crisis will bring people from all around the world to start appreciating the online learning possibilities. Nowadays, where many are already unemployed and millions still face unemployment, it is the Web that can offer people hope for a better future. Thus, it is important to inform potential users of methods of applying and harnessing the online educational resources, many of which are available free of charge.[3]

While some processes and technologies have flattened the world economically, they have at the same time opened it up educationally. The combination of technologies and resources that transform, enhance and extend learning is expanding and is more and more aimed at sharing that learning. The reach of a new idea or thought today is not only limited to a certain class of learners or a training programme, but can make an impact on anybody, no matter where they are. The organizations that take into account the technology trends of today and aim at new ways of education and training can take advantage of both financially attractive and strategically beneficial, as well as efficient open educational resources.[3]

The term Open Educational Resources (OER) was first used at a conference hosted by UNESCO in 2000 where it was introduced as a means of providing free access to educational resources on a global scale.[4] The concept of OER was finally formed during a UNESCO Forum on Open Courseware held in 2002. During an online discussion that followed and was also hosted by UNESCO, the initial idea was developed further as follows:

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”.[4] They are usually made freely available over the Web or the Internet and are mainly used by teachers and educational institutions in order to support course development; however, they can also be used openly by students. OERs contain not only learning objects, such as lecture material, references and readings, experiments, simulations and demonstrations, but also syllabuses, curricula, and teachers’ guides.[5] The main benefit of OERs is their potential and promise to remove demographic, economic, and geographic educational margins and to endorse life-long and personalised learning.[4]

Essentially, OER represent a very simple notion that is both legal and largely economic. It defines educational resources that are freely obtainable by educators and learners, without the need to pay any royalties or licence fees. Different outlines are being developed to manage the way OERs are licensed for use. Some of them allow copying, while others request the users to alter the resources that they use.[5]

To examine the educational potential of OER it is best to review a limited number of cases that highlight some of the best applications of this idea for improvements in higher education.[5]

Since its introduction in 2000, the term OER has gained substantial value worldwide and has yielded increasing interest in policy-making and institutional groups. Many individuals and institutions alike explore its idea and potential to help improve the delivery of higher education around the world.[5]

This report examines the concept of OER, it analyses existing European and other practices and principles of the development of OER and briefly explains the economic as well as the educational potential behind OER.

2 Models for Open Educational Resources - Different OER Models in Higher Education

Recently, a number of OER project have been started, either from governments, foundations and organizations, groups or individuals. They all have to be financially supported in some way, however none of their models has become dominant. The classification of OER models is as follows [6]:

- Endowment Model,
- Membership Model,
- Donations Model,
- Conversion Model,
- Contributor-Pay Model,
- Sponsorship Model,
- Institutional Model,
- Governmental Model,
- Partnerships and Exchanges.[6]

OER also involve issues related to intellectual property rights. There are two main licensing models that are critical for the OER initiative:

- Creative Commons, which is a non-profit organization that enables the sharing and use of creativity and knowledge through free legal tools,
- GNU General Public License, which is mostly used for software licensing.

Below, three models of OER in higher education are presented: the MIT model, the USU model, and the Rice model. These three models show an instructive variety in their size, organization, and provision of IP-clearance, content formation, and other services.

The organization of the **MIT Model** (developed by Massachusetts Institute of Technology) and the provision of its services are highly centralized and tightly coordinated, depending almost entirely on paid personnel. One of the key drivers and facilitators of the MIT project has been the foundation and private donor support it has been able to obtain. It has also successfully engaged sellers (such as Sapient, Microsoft, Maxtor, Hewlett-Packard, Akamai, and NetRaker) in partnerships. Most of the resources of the 2011 MIT OCW annual budget that amounted to over £2,000,000 were allocated to staff (including eight core staff members, five publication managers, four production team members, two intellectual property researchers, and ten department liaisons), technology and contracted services. It is unlikely that any other institution will be able to replicate the MIT model without substantial external funding.[4]

The **USU Model** (developed by Utah State University) is a hybrid of centralization and decentralization of both services and organization, where work is distributed across employed staff as well as a number of volunteers. The main objective of USU is to publish as many of the courses in the USU course catalogue as possible. Faculty members make USU OCW-related work eligible for credit in their courses by volunteering to coordinate this work as part of their teaching or advising responsibilities. To date, the USU has also obtained the William and Flora Hewlett Foundation support of more than £125,000. In 2007, the annual projected budget for USU OCW was just over £63,647 (including one full-time Director, two half-time graduate students, and three half-time undergraduates). It is possible that this model could be replicable by other institutions of higher education.[4]

The **Rice Model** (Rice University) is almost entirely decentralized with almost all of its services and resources provided by volunteers. The aim of Rice Connexions is to enable the collaborative increase of educational modules and courses by authors from around the globe. There is no target number of courses to be developed and the courses and modules in Connexions are not exclusively courses taught at the Rice University. Extensive documentation is provided on the site to offer guidance for course building, technical and pedagogical support as well as to help authors deal with copyright issues. The average price per course under the Connexions model seems to be extremely low. What is most important in this context is the fact that this is a model of volunteer-driven open resource communities and could as such be implemented and further investigated also by several other institutions.[4]

The MIT, USU, and Rice models show the variety of open educational resource initiatives in higher education from institutional course based to more community based bottom-up activities. There is also a diversity of in-between models forming a continuum. Even though there is no uniform model for any OER initiative, the existing models provide a good foundation for others to build on.[4]

3 OER Around the World

Much work on OER in higher education has been done in the United States of America, although international practices are increasing rapidly. One of the main methods of promoting OER worldwide is through OpenCourseWare (OCW), which focuses on developing and sharing freely available, stand-alone, online course, and teaching resources. OCW typically contains materials such as lecture notes, course assignments, reading lists, syllabi, study materials, tests, samples and simulations. In this regard, much work has been done by the **OpenCourseWare Consortium**.[5]

The OpenCourseWare Consortium is a global community of hundreds of higher education institutions and associated organizations that are dedicated to developing open education and its effect on global education. They strive to create a culture of an educational openness that would allow everyone, everywhere to access the education they want. They aim at delivering “a shared body of knowledge and the greatest practices”, which can be explored for original and effective approaches.[7]

Member institutions must commit to publishing materials from at least ten courses in a format that meets the agreed definition of OCW under their institution's name. OpenCourseWare Consortium's model encourages institutions to be included in some sort of established cooperation for sharing resources with others and to develop a common evaluation outline for all consortium members.[4]

The consortium has its members worldwide, from various countries, such as Saudi Arabia, Taiwan, China, India, Mexico and Japan. Among European countries, its members come from Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and United Kingdom. Even though most of the materials are in English, they are also available in numerous other languages, e.g. Chinese, Dutch, Spanish etc. Users can find course materials by searching across all courses in the OCW Consortium's website or by browsing OpenCourseWare websites of individual universities.[5]

The most renowned example of an OCW project, which is responsible for bringing numerous universities from all over the globe into the OER project, is the **Massachusetts Institute of Technology (MIT) OCW**.[5] By offering not only lecture notes, problem sets, reading lists, syllabi, tools and simulations, but also video and audio lectures, it has become the most copied institutional OER model. The main objective of the MIT OCW is to publish every course in the entire university catalogue in a fixed period of time, as well as repeatedly republish newer versions of the courses and archive the older versions. MIT has made an institutional commitment to sustain the project over the long term. Courses are available to educators and learners from all over the world free of charge, which enables them to draw on the materials for their own teaching and learning, to use them as a syllabus and course planning tool, or as inspiration for their own open content initiatives.[4]

The MIT OCW is accessed by a largely international group of educators and learners and averages at 1 million visits per month, with translations receiving an additional 500,000.[8] Fig. 1 depicts the percentage of visitors using the MIT OCW from different parts of the world.[8]

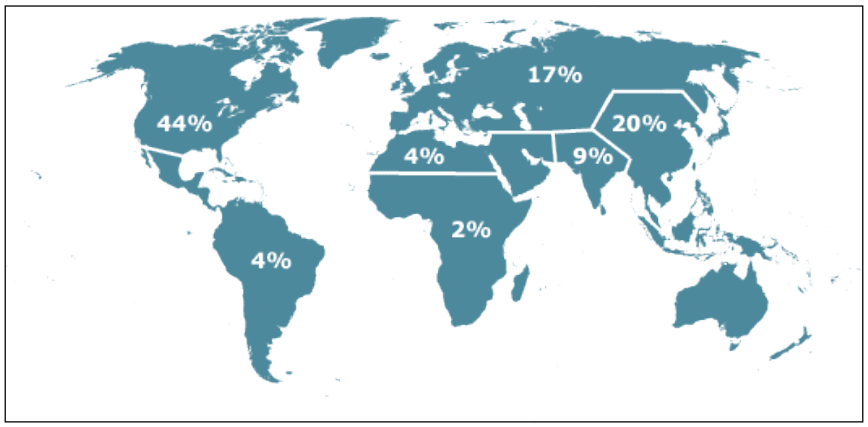

Figure 1. World map showing percentages of visitors of MIT OCW site.[8]

Their audience is divided into students, educators, and self-learners as seen in Fig. 2.

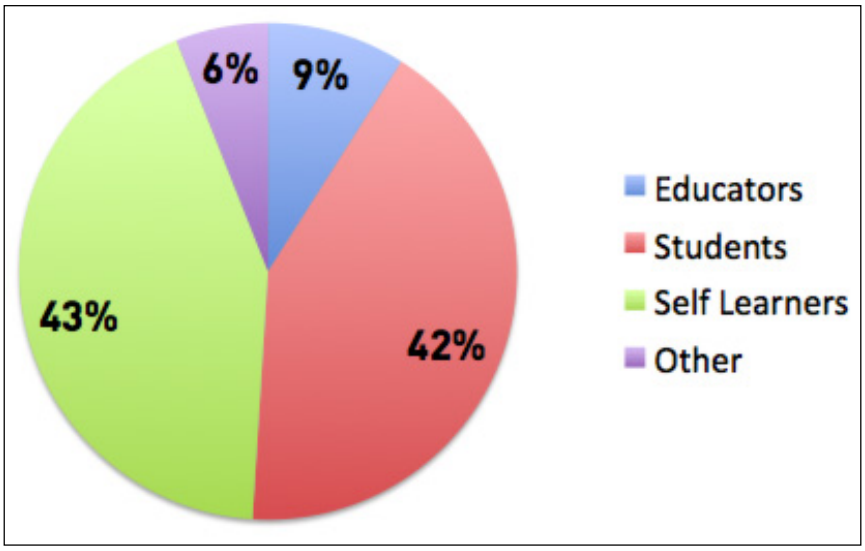

Figure 2. Pie chart showing percentages of different types of site users. [8]

Based on their statistics, listed in Table 1, the MIT OCW is being effectively used for a wide variety of purposes.

Table 1: Percentages and ways of use among different site users. [8]

USE SCENARIO		% OF USE
Educators	Improve personal knowledge	31%
	Learn new teaching methods	23%
	Incorporate OCW materials into a course	20%
	Find reference material for my students	15%
	Develop curriculum for my department or school	8%
Students	Enhance personal knowledge	46%
	Complement a current course	34%
	Plan a course of study	16%
Self-Learners	Explore areas outside my professional field	40%
	Review basic concepts in my professional field	18%
	Prepare for future course of study	18%
	Keep current with developments in my field	17%
	Complete a work-related project or task	4%

The MIT OCW has already had a substantial impact and visitors expect an even larger impact in the future. According to their site statistics:

- 80% of visitors rate OCW's impact as extremely positive or positive; 91% expect that level of future impact.
- 96% of educators say the site has/will help improve courses.
- 96% of visitors would recommend the site.[8]

Similarly, the Multimedia Educational Resource for Learning and Teaching Online, **MERLOT**, also provides open resources that are free of charge and intended mainly for faculty and students of higher education.[5] As of June 2012 MERLOT had 104,771 members and over 35.186 educational materials in varied disciplines and types.[9] Its users can find peer reviewed teaching and learning materials online, as well as share information and their knowledge about education with expert colleagues. The site is organized by discipline and is free for anyone to use.[5]

Another project, **Coursera**, currently offers over 500 courses, for more than 4.4 million learners, and includes 97 “global partners” as well as 10 US state institutions (global partners being US and international universities). About half of the non-US higher education institutions involved come from Europe. Interestingly, basically all the universities that joined the project most recently are from outside the US, mostly from Europe and Asia. Coursera strives to create critical mass and thus become the principal player. Apparently, its main attraction is not only the MOOCs concept as such, but also the fact that Coursera has established a platform that allows for automatic (machine) assessments in a more sophisticated way than other existing platforms.[10]

The **edX** consortium currently comprises of 34 universities including the founders and owners of edX, Harvard University and Massachusetts Institute of Technology (MIT). In addition, the edX consortium also includes 18 partner institutions from outside of the US, out of which five are European universities: École Polytechnique Fédérale de Lausanne (EPFL) (Switzerland), TU Delft (the Netherlands), Karolinska Institutet (Sweden), Université catholique de Louvain (Belgium), Technische Universität München (Germany), and 11 are universities from India, China, Hong Kong, South Korea, Japan and Canada. Currently, 175 courses are on offer in various areas, many of which are interdisciplinary. Although it does not offer course credits, edX does issue certificates for successful completion of a course at no extra charge. Due to its non-profit nature, edX has to cover all costs. Thus, it currently charges institutions for their use of its platform, and services it provides. However, edX management recently admitted that they have not yet decided on the main source of the revenue. Thus, its most recent move to join forces with Google might not be too much of a surprise. It is still uncertain exactly what this partnership will entail.[10]

Established in April 2013, **NovoEd**, aimed at students and teaching staff, currently offers around 20 courses, most of them for a fee. Its goal is to supplement existing higher education provision. Since NovoEd was formed by a professor and a PhD student from the University of Stanford, its staff and most courses are from that university. Reportedly, some of the courses are accessible exclusively for Stanford students only. An important feature, developed in 2012, is its platform, which claims to improve peer interaction and collaboration.

Learners are assigned into groups of less than 10 peers.[10] NovoEd officials stated that this approach resulted in an improved completion rate of close to 13 percent or higher, compared to the 10 percent of most other MOOCs.[11]

Udemy, established in 2010, provides 8,000 courses for 1 million learners. Focused on practical skills (e.g., computer skills, salary negotiation skills), their courses target end users of various professions. Udemy collaborates with individual lecturers, not with institutions. It takes pride in engaging expert lecturers from everywhere, including business as well as Ivy League universities. However, it still invites everybody to become a lecturer, and also offers courses to help individuals set up their own courses that meet the quality requirements. It provides a detailed list of conditions that have to be met in order to publish the course (e.g. at least 30 minutes of content, of which 60% must be video; clear structure; standards to be met for audio and video quality; a free-to-try lecture etc.). Most courses charge a fee between US$9 and US$99.[12]

Udacity, co-founded by a Stanford professor, who started offering information science courses online in 2012, is a for-profit company. According to the website, it is a “digital university on a mission to democratize education”, i.e. to bring high education to a wider public at a lower price. Its courses are free of charge, although for certifications fees may be charged. Udacity began as a partnership with the electronic testing company Pearson VUE by offering final examinations that would be accepted by employers. Allegedly, Udacity does not have a university partner.[12] As of January 2014, Udacity's courses have drawn in around 1.6 million students[13] with 300.000 students enrolled in the CS 101 (Computer Science) course.[14]

Khan Academy, on the other hand, is a non-profit educational website. Created in 2006 by educator Salman Khan, who is a graduate of MIT and Harvard Business School, its stated mission is to provide "a free, world-class education for anyone, anywhere."[15]The website features thousands of educational materials that include a personalized learning dashboard, over 100,000 exercise problems, and over 4,000 micro lectures in the form of video tutorials. The latter are uploaded on YouTube and feature teaching mathematics, history, healthcare, medicine, finance, physics, general chemistry, biology, astronomy, economics, cosmology, organic chemistry, American civics, art history, macroeconomics, microeconomics, and computer science. All resources can be obtained worldwide free of charge. Khan Academy reaches around 10,000,000 students a month and has provided over 300,000,000 lessons.[15]

Established in 1999, Rice University's **Connexions** is an OER repository arranged into independent modules, which can either be freely accessed by students or can be used by educators within their own curriculum. The Connexions library now contains over 21,500 reusable modules, connected with almost 1,300 collections. **OpenStax Collage** is another Rice University project. Its objective is to create complete, authoritative university textbooks for subjects starting with physics, sociology and biology. While basic downloads of these texts are free of charge, inexpensive print-on-demand versions can also be purchased.[16]

Covering primary, secondary and post-secondary education, OER **Commons** describes its mission as "curating best in class learning materials from around the world since 2007." In addition to quality management of OER resources, OER Commons also offers tools for creation, sharing and discovering, as well as training services.[16]

Being a project of numerous higher education institutions, **University** is another OER with the proclaimed goal of "creating flexible pathways for OER learners to gain academic credit." Their website is hosted by WikiEducator, a community for the collaborative planning and development of OER products.[16]

4 Review of Open Educational Resources (OER) in Higher Education at EU Universities

One of the most important and challenging tasks considering the open education resources movement is clarifying who is involved and what it is they do. The list of OER initiatives below comprises of only a few examples of the still growing number of Higher Education Initiatives (HEI), organisations and individuals in EU committed to providing and promoting open education to the global teaching and learning community.[4]

4.1 OpenCourseWare Europe consortium

As part of the Opening up Education initiative, Open Education Europa was launched by The European Commission in September 2013 in order to provide a single gateway to European OER. Its main objective is to offer access to all existing European OER in different languages in the interest of presenting them to learners, teachers and researchers. [17] The innovative open-source technology of the dynamic Open Education Europa platform offers tools for communicating, sharing and discussing. [18]

Considering the challenges and issues related to the quality of OER, the European Foundation for Quality in e-Learning (EFQUEL) has issued a guide for policy makers to explain open educational practice, and to recommend ways of education systems to embrace this concept. The publication draws on work executed by the Open Educational Quality (OPAL) Initiative. [18]

The OpenCourseWare Europe consortium is a part of the global OpenCourseWare movement. All Europe consortium partners play an active role in the international OCW movement and have acknowledged OpenCourseWare as a development priority. The Catholic University of Leuven is in its final stages of developing an OCW programme that will soon enable the publishing of its first online courses, while the universities of Madrid, Barcelona, Lyon and Delft have already published a substantial amount of their own resources as OCW.[19]

The European consortium partners regard OCW as a vital component of the virtual mobility development. It allows students to follow (part of) a programme from their home campus and/or to better prepare themselves for studying abroad. It enhances the transparency by showing what HEI have to offer (expertise, content, required entry knowledge), that can help students with selecting a suitable foreign institute. It is also a valuable method of facilitating and enhancing cooperation between institutes through joint course development.[19]

There is a growing interest of European HEI in OER and OCW. The number of free courses published online has grown exponentially since the first initiation of the OCW movement by

MIT in 2001. Over fifty European partners joined the movement in recent years.[19] Current European members are listed in Table 2.

Table 2. An overview of current European members of the OCW Europe consortium.[19]

Austria	Klagenfurt University
Belgium	International Network for Cancer Treatment and Research
Cyprus	Students Circle Network
Denmark	VIA University College, Denmark
France	Grenoble Ecole de Management, Université de Lyon, Paris Tech
The Netherlands	Open University Netherlands, TU Delft, European Association of Distance Teaching Universities
Poland	AGH Universityof Science and Technology
Spain	Escuela de Organización Industrial, Fundación Universitaria San Pablo CEU, IE University, Universidad Autónoma de Madrid, Universidad Carlos III de Madrid, Universidad de Alicante, Universidad de Cantabria, Universidad de Castilla-La Mancha, Universidad de Deusto, Universidad de Granada, Universidad de Huelva, Universidad de La Laguna, Universidad de Malaga, Universidad de Murcia, Universidad de Navarra, Universidad de Oviedo, Universidad de Salamanca, Universidad de Sevilla, Universidad de Valladolid, Universidad de Zaragoza, Universidad del Cádiz, Universidad Extremadura, Universidad Internacional de Andalucía, Universidad Nacional de Educacion a Distancia, Universidad Politécnica de Cartagena, Universidad Politécnica de Valencia, Universidad Politécnica Madrid, Universidad Rey Juan Carlos, Universidade de Santiago de Compostela, Universitat Autónoma de Barcelona, Universitat de Barcelona, Universitat de Girona, Universitat de les Illes Balears, Universitat de Lleida, Universitat de Valéncia, Universitat Jaume I, Universitat Oberta de Catalunya, Universitat Rovira i Virgili, UPV/EHU, UNIVERSIA
United Kingdom	Mathematical Institute, Oxford University, People's Open Access Education Initiative, The Open University, The University of Nottingham, iBerry, JISC, The Higher Education Academy (HEA)

Nonetheless, the consortium partners are still not convinced that OCW's potential is fully utilized, since its possibilities are not yet well known by students. The pedagogic aspects to enable self-studying for a wide range of users are sometimes still neglected. In addition, the large-scale utilization is also inhibited by issues regarding cultural differences, recognition, quality control, interactivity and support (either from fellow students or teachers).[19]

This observation is confirmed by a recent study conducted by the "Open Educational Quality Initiative". Their report "Beyond OER, Shifting focus to OER educational practices" that is soon to be published concludes that "Much greater efforts will have to be made in the future to understand and address the personal, organizational and environmental factors hindering or enabling creation, sharing, use and reuse of OER". The report explains that most problems are not associated with accessibility and availability but are the result of limited organizational support, lack of a culture of sharing within organizations, lack of skills, quality, trust, or time and skills for adaption.[19]

The main goal of the project is to support virtual mobility on the basis of OCW. This corresponds well with the agenda of many national governments, HEI and the EU. As indicated by the Erasmus Student Network report, "Obstacles in Student Mobility", the three main obstacles to mobility are: recognition of courses, the financial situation of students, and the poor information provision. This project offers a partial solution to the first obstacle by developing a guideline for recognition of the OCW version of courses. It also tackles the last two obstacles by providing students with a virtual alternative and/or by giving students the chance to better prepare for their studies abroad.[19]

One of the desired outputs of the project is for it to become a starting point for the initiation of a European affiliate for the global OCW-Consortium, OCWC. This will appeal to a broad European basis as well as contribute considerably to the sustainability of the project.[19]

The objectives of the OCW Europe consortium can be summarized as follows:

- To develop and promote a clear set of recommendations for optimizing the use of OCW for the purpose of promoting virtual mobility for regular students and lifelong learners on the basis of research and best practices.
- To make agreements with relevant partners to put these recommendations into practice as part of an on-going cooperation.
- To initiate a European OCW-network in order to optimize its potential.[20]

In a progress report entitled »OpenCourseWare in the European Higher Education Context« issued by OCW Europe Consortium, the authors wrote about ways to use OCW's potential for virtual mobility:

Although OER and more specifically OCW are on the political agenda of EU along with many other national governments and are supported by many stakeholders in the educational domain, their use in higher education has yet to reach a critical threshold. Even when OER/OCW are implemented, focus still remains on providing more access to digital content, thus not enough attention is given to the support of student virtual mobility. Many higher education institutions (HEI) in Europe do not yet partake in the OCW movement and not all students are aware of OCW and its potential. The prerequisites for recognition of OCW as an element of virtual mobility are the establishment of business models and the acquisition of governmental support. Lastly, cultural differences and different teaching methods can also act as obstacles to different users of OCW/OER.[21]

In order to address these challenges, cooperation between HEIs is needed to improve recognition within the framework of virtual mobility, quality, and support for users of OCW/OER and to possibly make arrangements for joint degrees. Firstly, the principal focus

of the project is specifically on complete courses of OCW and not on other categories of OER. Secondly, the project explicitly addresses OCW's part in the context of virtual mobility. Thirdly, it targets traditional HEI with specific backgrounds, challenges and opportunities in regard to OCW.[21]

The project focuses on creating preconditions for a strong European OCW framework. A stronger framework will also result in closer cooperation between European institutes, which could lead not only to mutual use of resources but also joint degrees. A more effective OCW-system will improve the quality and increase the usage of online courses and consequently facilitate virtual mobility.[21]

Within the project the following methodology to reach its objectives is used:

Phase 1: Conducting research, organizing brainstorm meetings with experts in the field and presenting results.

Phase 2: Organizing workshops that focus on dissemination of research results.

Phase 3: Publication and dissemination of final reports.

Phase 4: Regarding the project's outputs, dissemination of a European OCW Consortium.[21]

4.2 Miriada X, iMOOC, FutureLearn, Alison, FUN

Miriada X

In January 2013, Miriada X was launched in Spain as a cooperation between the Spanish company Telefonica and Universia. It is designed to enable exchanges and cooperation between Spanish and Latin American institutions. To date, 20 institutions have joined, out of which 17 are from Spain and 3 are from Puerto Rico and the Dominican Republic.[10] It offers courses free of charge with over 600.000 people registered as of March 2014, according to their official website statistics. There seems to be a strong interest in MOOCs in Spain in general.[10]

iMOOC

So far, Portugal has only had two MOOCs, albeit with interesting conceptual approaches. One of them has been established in cooperation with Brazilian partners. The Universidade Aberta (Portuguese Open University) launched a project called iMOOC, where "i" stands for individual responsibility, interaction, interpersonal relationships, innovation and inclusion. Its aim was to develop pedagogy for MOOCs that correspond with its educational principles: "autonomous and self-directed learning with a strong social dimension and the flexibility that distance online learners need." [10]

FutureLearn

FutureLearn, led by the Open University, was announced at the end of 2012 as a British platform, and launched in the UK in September 2013. Since then, both Trinity College Dublin, Ireland, and Monash University, Australia, have joined the platform. The platform now includes a total of 26 partners, including the British Library, the British Council and the British Museum. Their course offer is still to be announced, however according to their website,

learners from over 150 countries have already expressed their interest by signing up. FutureLearn promises to keep courses free of charge and adaptable to mobile devices such as smart phones.[10]

Alison

Established in 2007 and based in Ireland, Alison is a social operation providing distance learning. As stated on its website, it offers about 600 courses to 2.5 million learners around the world. Course participation is free of charge, although Alison does charge for service and support, as well as for courses for corporations. It mentions that its courses comply to both British Council and Australian High School standards as well.[10]

FUN

By using edX's open source learning platform, the French Government has launched FUN (France Université Numérique), the first French MOOC portal which provides a wide audience, notably in French-speaking countries with 20 MOOCs to begin in January 2014. The five-year strategic plan for the digitalization of learning and teaching contains 18 action points, one of which is also the MOOC platform. Although it was first announced as a national platform with participation restricted only to French institutions, it has later been stated that it could also open up to courses from universities outside of France.[10]

4.3 Eliademy, OpenHPI, opencourseworld, iversity, OpenLearn

Eliademy

Eliademy was established in Finland by former Nokia developers. An announcement and announced of developing a MOOC platform was also made. However, at this time, it appears to only provide a concept of a mobile phone compatible virtual classroom. A free version is available for individuals and companies are obliged to buy licenses.[10]

OpenHPI

OpenHPI, a MOOC developed by Germany, was launched on 03/09/2012. According to their website, 2,137 out of 13,126 participating learners earned their grated certificate. They offer the courses in English and German.[10]

opencourseworld

Another MOOC developed in Germany is opencourseworld, which was established by IMC AG, a spin-off company offering IT and service solutions, formed by the University of Saarland where students have the option to purchase a paid certificate at the end of each MOOC. IMC currently works with 20 partners (higher education institutions, research institutions and companies), including three German universities (University of Saarland, University of Hamburg, and Technical University Munich).[10]

iversity

The main objective of iversity, another Germany-based MOOC, which launched in 2011/2012 as an international think-tank, is to push education into the digital era. It collaborates with the

German Government as well as private national foundations, which contribute to its funding. The courses offered are in German and English.[10] Since they are based in Europe, they have the advantage of using the European Credit Transfer System (ECTS). Their partnered institutions have the chance to offer exams that also award ECTS credits. In doing so they are the only MOOC platform with courses offering ECTS credits and are working on expanding this opportunity even further.[22]

openupEd

Apart from the Open University UK, which announced its involvement in Futurelearn, other European open universities were somewhat silent about the developments until 2012. In April 2013, this changed with the launch of OpenupEd, a portal that posts courses that were developed earlier but are now offered free of charge. It is "the first MOOCs initiative which goes Europe-wide, with the support of the European Commission". To date, courses covering a wide range of topics are available in 12 different languages. The 11 launch partners come from France, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Spain, and the UK, and outside the EU from Russia, Turkey and Israel.[10]

OpenLearn

OpenLearn is a well-known institutional source of HE OER. The Open University is one of the most successful distance education universities in the world. It strives to be a world leader in the design, content and delivery of supported open and distance learning through academic research, pedagogic innovation and collaborative partnership. Open University course materials are available free of charge on the OpenLearn website. Users can find hundreds of free study units within twelve topic areas, each with a discussion forum.[5]

OpenLearn offers a range of methods and strategies to establish communities of educators and learners around its content. It complements the MIT by providing both a selection of freely available course material and a set of tools to help authors publish and support collaborative learning communities. It is composed of two sections: the LearningSpace that offers materials for learning and the LabSpace where content can be downloaded, re-mixed, adapted and reused.[4]

4.4 JORUM, iTunes U, ParisTech, Universia, IREL-Open

JORUM

JORUM is one of numerous HE OER activities based in the UK. It is a free online repository service for teaching and support staff in Further and Higher Education Institutions in the UK. The wide range of resources in the JorumOpen collection includes freely available OER. It focuses on helping to build a community for sharing, reuse and repurposing of learning and teaching resources. Figure 3 shows the increase in the use of OER from the JORUM website in the last year.[5]

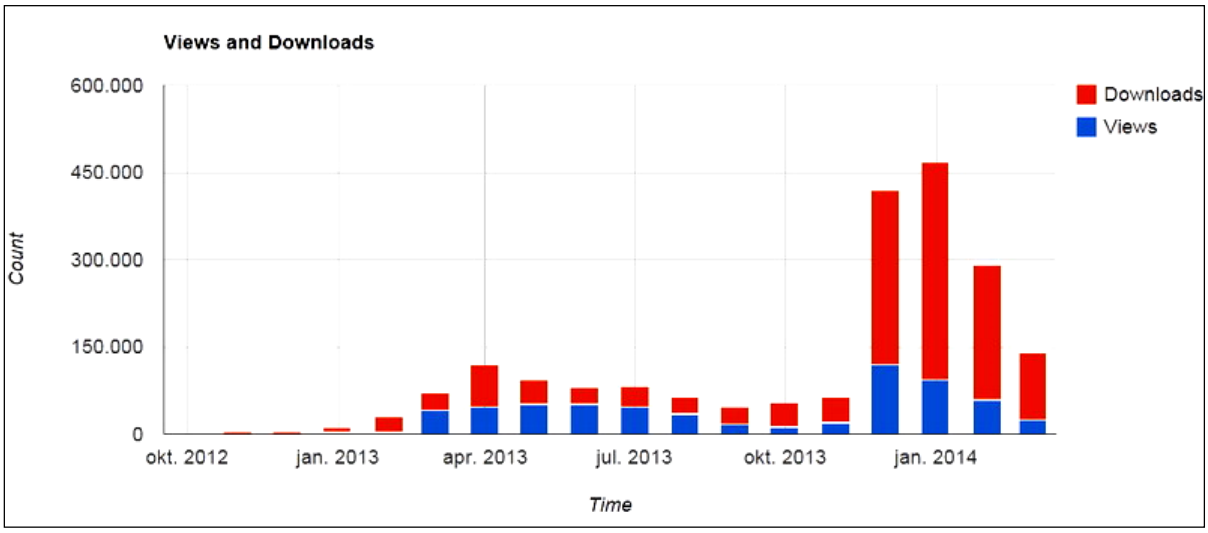

Figure 3. Increase in use of OER from JORUM website.[5]

iTunes U

In association with OER projects at EU universities some OER Tools and Services are also of importance. A good example is iTunes U, which has gained immense popularity as a content-sharing initiative. Launched in 2007, Apple's iTunes University not only enables HEI to make audio and visual contents freely available for download but also makes provision for subscriptions for those who wish to sell their content. A year after its launch, iTunes U logged more than 4 million downloads and two years since its launch, iTunes U reached a new milestone with over 100 million downloads. According to Apple, the United Kingdom-based Open University has been one of the most popular areas of iTunes U.[5] Users can easily search, play, and download course content just like they do music and movies.[4]

The academic institution says it supplies at least 150,000 undergraduate and 30,000 postgraduate students, over 25,000 of who live outside the UK. Currently, over 175 higher-education organizations provide content to iTunes U, including Oxford University, Open University, Trinity College Dublin and Norwegian University of Science and Technology.[5]

ParisTech

In November 2003, 11 ParisTech engineering institutions launched an ambitious project, aimed at making available some of their educational materials like lecture notes, exercises, yearly archives, simulations, animations, course notes and videos. One objective of this project is to promote high quality teaching provided by those institutions in the interest of attracting foreign students. Another aim of the project is to contribute to overcoming the digital gap by making available Open Access Educational Resources, in accordance with the recommendations of the World Summit on the Information Society (WSIS).[4]

In December 2008, the website experienced a major evolution and it now offers access to Open Course Ware and PhD Thesis on one hand and the homogeneous institutional display of all the Credits, Training programmes and Books written by faculty members on the other. The entire content of the website is structured and can be searched according to ten main

fields of scientific expertise of ParisTech.[23] There are more than 2,500 teaching resources, 2,700 courses in around 200 programmes of teaching units, as well as a catalogue of more than 1,500 PhD thesis available freely online.[24]

Universia

In EU, projects that make OCW materials available in multiple languages are also underway. One such project, Universia, was created by the largest Portuguese and Spanish speaking network of universities. Composed of 1,242 partner universities from 23 Latin American countries, it represents 15.3 million students and university teachers. Universia has been committed to open access learning from the start, promoting the OCW Universia Consortium and forming a partnership agreement with the Polytechnic University of Madrid for joint growth of the initiative.[25] Its site contains both Spanish and Portuguese OCW from different participating institutions[5], as well as advantages and disadvantages of joining a OCW project recognized by participating staff and also an answer to the question "What does the membership of the OCW Consortium provide?"[26]

Advantages:

- Advanced knowledge through educational resources and extending localisation mechanisms.
- Promotion of innovation and perfected teaching resources used by tutors.
- Bringing tutors closer to IT.
- The opportunity to broach the ordering of intellectual property and author recognition.
- Greater protection of each institution's mission.[26]

Disadvantages:

- The tutor must review the teaching material and structure it in line with OCW.
- Increased cost of tutor support and provision of new services.
- Limitations of exclusive or commercial use of educational resources.
- Possible repetition of resource management as two different contexts are in use. [26]

"What does the membership of the OCW Consortium provide?" In order for it to be beneficial the following should be evaluated:

- Integration in the Strategic Plan.
- Its flexibility and adaptability to the Institution.
- The sharing of support, resources, experiences, good practice...
- A wider repercussion and scope of work.
- The member institutions of the Consortium reinforce the image of the Institution itself.[26]

IREL-Open

In 2007, Irish universities received government funding in order to build open access institutional repositories IREL-Open and also develop a federated harvesting and discovery service via a national portal. The intention of this collaboration is to expand and embrace all Irish research institutions in the future. This workspace of the IREL-Open Project Working

Group provides cross searching Irish university open access repositories by the Google Custom Search Engine.[4]

4.5 WB: Budi Inženjer, Znanje za sve, DLS

Budi Inženjer

At the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka a similar initiative to the Khan Academy was organised. The website offers simple video tutorials, although it does not provide any interactivity for the users.[27]

Znanje za sve

The Belgrade University library "Svetozar Markovic" started a project of translating courses and free (open) teaching materials into the Serbian language, with the purpose to ensure the highest possible availability of teaching materials in the Serbian language for all interested users. The library informs people about the free online education, which are intended for anyone.[28]

LINKgroup DLS

LINKgroup Company Ltd. Belgrade has developed its own system for distance learning, a platform called Distance Learning System (DLS), which contains a large number of courses. Some of them are intended for students, pupils and students attending schools that operate within the LINKgroup Company, while a great number of courses are designed for ordinary users to learn and develop new skills. [29]

So far there is still little information about MOOCs developments in eastern Europe, with the exception of Kaunas University in Lithuania, and one initiative in Slovenia.[10].

Some universities are cautiously drawing a line between the education they offer and MOOCs. Reportedly, the University of Cambridge has no plans to offer MOOCs.

5 How Can Education Benefit by Harnessing OER?

The most important reason for harnessing OER is the fact that openly licensed educational resources have an exceptional potential to contribute to the improvement of the quality and effectiveness of education. Apart from responding to the demand for access to ICT infrastructure, educational institutions are also required to improve the teaching and learning environment (development and enhancement of curricula, programme and course design, planning of contact hours, elaboration of quality teaching and learning materials, effective assessment) while managing the associated costs through increased use of resource-based learning.[30]

The transformative educational potential of OER revolves around three related prospects:

1. Increasing the availability of high quality, relevant learning resources can contribute to more productive learners and educators. Since OER eliminates all restrictions regarding copying resources, it can decrease the cost of accessing educational materials. In many

systems, royalty payments for text books and other educational materials represent a substantial proportion of the overall cost, while procedures of obtaining permission to use copyrighted material can also be very time-consuming and expensive. [30]

2. One of many mechanisms for creating roles for students as active participants in educational processes is provided by the principle of allowing adaptation of materials. Students learn best not by merely passively reading and absorbing, but by doing and creating. Content licences that encourage students' activity and creation through the re-use and adaptation of that content can make an important contribution to creating a more effective learning environment.[30]
3. OER has the potential to build capacity by providing institutions and educators with access, at low or no cost, to resources they need in order to advance their skills in producing teaching and learning materials, as well as by implementing the necessary instructional design to allow for an integration of such materials into high quality programmes of learning.[30]

Deliberate openness therefore acknowledges that:

- Investment in creating effective educational environments is crucial for good education.
- The key to a productive system is to build on common intellectual capital, rather than reproducing similar efforts.
- All things being equal, collaboration will increase the quality.
- Since education is a contextualized practice, it is vital to make adaptations of materials imported from different settings easy (where this is required), which should be encouraged rather than restricted.[30]

OER initiatives and open licenses options provide many benefits for educational institutions, individuals and commercial organizations[31]:

- Offer a vast variety of freely available resources for both learners and teachers.
- Do not limit the ways of adapting and re-using these resources to suit the user's context.
- Let teachers and learners see a range of alternative methods for extending and enriching the curriculum.
- Encourage the practice of sharing, improving the quality and lowering the cost of curriculum development.
- Lowering obstacles like cost and availability, thus enabling collaborative projects, which are particularly valuable when they cross sectors (e.g. university-industry partnerships) and the production of materials suited for individual professionals or workplace settings. Lower barriers therefore enable mass participation which can spread far beyond the confines of traditional formal education.[31]

6 Conclusions

It is in human nature to connect, exchange, share, remix, and reinvent. With rapidly increasing the volume of global knowledge, there is an increasing interest in sharing that same knowledge through the OER. All actors, educational institutions, companies and learners, have realized the benefits of knowledge sharing and OER.

It seems there are more than enough platforms today that in technical terms allow the implementation of OER on the World Wide Web. The average user might even come to the conclusion that too many exist and the entire subject appears to be too fragmented and opaque.

However, it can also be seen that over the last decade, when the actual development of OER started, Higher Education has been divided into two groups: supporters and participants on one side and those who have reservations about the project on the other side. The common goal of higher education in Europe should be to improve the awareness of the OER benefits and to disseminate initiatives for identifying the opportunities of making the link between OER and the virtual mobility of students.

7 References

[1]. 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*. Available from: <http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf>. [4 April 2014].

[2]. EP Library. 2013. *Open Education: OER, OCW and MOOCs.* Available from: <http://epthinktank.eu/2013/10/01/open-education-oer-ocw-and-moocs/>.

[4 April 2014].

[3]. Bonk, J.C. 2009. *The World is Open: How Web Technology is Revolutionizing Education*. San Francisco, CA: Jossey-Bass, a Wiley imprint. Available from: <http://pt.slideshare.net/druelyn/the-world-is-open-curtis-jbonk#>. [24 April 2014].

[4]. Yuan, L., MacNeill, S. and Kraan, W. 2009. *Open Educational Resources – Opportunities and Challenges for Higher Education.* Available from: <http://www.oerafrica.org/resource/open-educational-resources-opportunities-and-challenges-higher-education>. [24 March 2014].

[5]. Butcher, N. 2010. *Open Educational Resources and Higher Education*. Available from: <http://www.oerafrica.org/resource/open-educational-resources-and-higher-education>. [24 March 2014].

[6]. Downes, S. 2007. *Models for Sustainable Open Educational Resources*. Available from: <http://ijklo.org/Volume3/IJKLOv3p029-044Downes.pdf>. [15 April 2014].

[7]. *Open Courseware Consortium*. Available from: <http://www.ocwconsortium.org/about-ocw>. [24 March 2014].

[8]. *MIT OpenCourseWare*. Available from: http://ocw.mit.edu/about/site-statistics/. [24 March 2014].

[9]. Cohen, A., Reisman, S. and Sperling, B. 2013. *Personal Collection in MERLOT as a Compilation of Learning Object Repository*. Paper for the 2013 Informing Science + IT Education Conferences, Porto, Portugal. Available from: <http://proceedings.informingscience.org/InSITE2013/InSITE13p029-039Cohen0075.pdf>. [4 April 2014].

[10]. Gaebel, M. 2014. *MOOCs Massive Open Online Courses – January 2014, An Update of EUAs First Paper (January 2013).* Available from: <http://www.eua.be/eua-work-and-policy-area/building-the-european-higher-education-area/e-learning/moocs.aspx>. [24 March 2014].

[11]. Heussner, K.M. 2013. *NovoEd, Another Stanford MOOC Startup, Opens Small- group Learning Services to Public*. Available from: <http://gigaom.com/2013/04/15/novoed-another-stanford-mooc-startup-opens-small-group-learning-services-to-public/>. [4 April 2014].

[12]. Gaebel, M. 2013. *MOOCs Massive Open Online Courses*, EUA Occasional Papers. Available from: <http://www.eua.be/eua-work-and-policy-area/building-the-european-higher-education-area/e-learning/moocs.aspx>. [24 March 2014].

[13]. Chafkin, M. *Udacity's Sebastian Thrun, Godfather Of Free Online Education, Changes Course*. Available from: <http://www.fastcompany.com/3021473/udacity-sebastian-thrun-uphill-climb>. [4 April 2014].

[14]. Wulf, J., Blohm, I., Brenner, W. and Leimeister, J.M. 2014. *Massive Open Online Courses*. In: Business Information System & Engineering (BISE). Available from: <https://www.alexandria.unisg.ch/export/DL/229496.pdf>. [4 April 2014].

[15]. *Khan Academy*. Available from: <http://www.khanacademy.org>. [24 March 2014].

[16]. *12 Open Educational Resources: From Khan to MIT*. Available online: <http://www.informationweek.com/software/12-open-educational-resources-from-khan-to-mit/d/d-id/1109021?page_number=1>. [24 April 2014].

[17]. *Open Education Europa*. Available from: <http://openeducationeuropa.eu>. [15 April 2014].

[18]. *Open Educational Quality Initiative*. Available from: <http://www.oer-quality.org>. [15 April 2014].

[19]. *OCW Europe Consortium, Background*. Available from: <http://www.opencourseware.eu/background>. [24 March 2014].

[20]. *OCW Europe Consortium, Deliverables.* Available from: <http://www.opencourseware.eu/deliverables>. [24 March 2014].

[21]. Valkenburg, W. 2012. *OpenCourseWare in the European Higher Education Context - How to Make Use of its Full Potential for Virtual Mobility.* Available from: <http://www.opencourseware.eu/report>. [24 March 2014].

[22]. iversity. *About us*. Available from: <https://iversity.org/en/pages/about>. [4 April 2014].

[23]. *ParisTech Libres Savoirs.* Available from: <http://graduateschool.paristech.org/?langue=EN>. [24 March 2014].

[24]. Absolute Astronomy. *ParisTech*. Available from: <http://www.absoluteastronomy.com/topics/ParisTech>. [4 April 2014].

[25]. OCW Consortium. *Universia*. Available from: <http://ocw.universia.net/en/>. [4 April 2014].

[26]. *OCW Universia, Reasons for deciding to join*. Available from: <http://ocw.universia.net/en/razones-incorporacion-ocw.php>. [24 March 2014].

[27]. *Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka, Budi inženjer (eng. Be an Engineer.)*Available from: <http://budi.inzenjer.org>. [12 April 2014].

[28]. *Belgrade University Library "Svetozar Markovic", "Znanje za sve" (Knowledge for All).* Available from: <http://unilib.libguides.com/mooc>, <http://unilib.rs/znanjezasve>. [12 April 2014].

[29]. *LINKgroup Company Ltd. Belgrade, Distance Learning System (DLS)*. Available from: <http://www.link-elearning.com/site/home>. [12 April 2014].

[30]. Butcher, N. 2011. *A Basic Guide to Open Educational Resources (OER)*. Available from: <http://www.oerafrica.org/resource/basic-guide-open-educational-resources-oer>. [24 March 2014].

[31]. Falconer, I., McGill L., Littlejohn A., Boursinou E. 2013. *Overview and Analysis of Practices with Open Educational Resources in Adult Education in Europe*. Available from: <http://ftp.jrc.es/EURdoc/JRC85471.pdf>. [15 April 2014].

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