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MOOC-Maker

Construction of Management Capacities of MOOCs in Higher Education

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Report on Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs)

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This report is developed under the project MOOC-Maker. This is a project funded by the European Commission Erasmus+ which has as main purpose to develop capabilities for the Construction of Management Capacities of MOOCs (Massive Open Online Courses) in Higher Education and conduct research about the initiatives developed. This report is the result of the research activity developed in the work package WPD1.12 of the project. The present report presents an exploration regarding the open educational resources and its relation with the MOOCs, including aspects related to its re-use and recognition of authorship. This information will allow us to present a current panorama as the basis of the actions to be taken in the project. With the development of this panorama the following report aims at contributing to the main objective of the project that is to "improve the quality and access to teaching-learning programs through the implementation of high quality MOOCs that address the development of competencies and knowledge that are required in today's learners".

SECTION 1. INTRODUCTION

All around the world higher education institutions have been creating new ways to share knowledge and learning opportunities using the Internet and digital technologies. Initiatives such as Open Educational Resources (OERs) and MOOCs (Massive Open Online Courses) are examples of the increased attention given to these initiatives for their potential to expand lifelong learning opportunities. Teaching and learning are rapidly changing by the influence of OERs, particularly in higher education.

This report provides the framework for the discussion on the conceptual and contextual issues around OERs, a review of the current OER initiatives and the generations that have emerged, followed by the main characteristics of OERs. This report will also focus on the emergence of Open Education Practices such as MOOCs and how these new architectures shift the culture education, from the closed institutional point of view to a digital and virtual open education almost accessible and free to all.

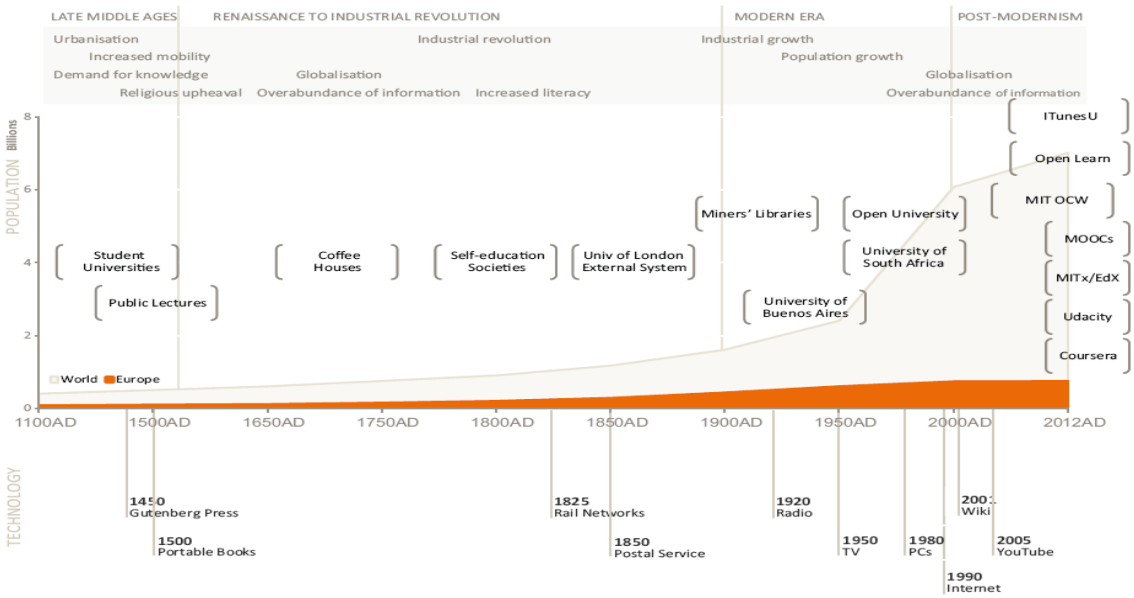
1.1. The Role of Openness in Education

In the last ten years, we have been witnessing the emergence of many initiatives all over the world, under the banner of openness in Education. This watermark has been stimulating a growing number of initiatives such as practices, platforms and materials that try to make education and training open to the world. But there is still an ongoing debate around the definition and the meaning of openness in education. Is it the technological innovations the only driver for making education open? Or is it a

philosophical issue based on the idea that knowledge should be accessible to everybody as openly as possible?

It is commonly referred that the main milestone in the Open Education movement is the foundation of the United Kingdom Open University in 1969. But the emergence of openness in education can be tracked in history long before this important event, in several movements, discourses and approaches that do not always indicate the term open. Peter & Deimman (2013) developed and historical approach in which they bring clarity to the concept of openness in Education and try to reveal some of the tensions around it, as can be seen in Figure 1.

FIGURE 1: The Role of Openness in Education: An historical reconstruction



Source: S. Peter S. & M. Deimann (2013)

Peter & Deimman (2013) go back to earlier time periods such as the open adult education movement on the twelfth century and the changes that occurred in the late middle ages when students themselves started to seek out knowledge that was the base or the future establishment of universities. Another important period is in the 17th century when patrons were allowed to participate in discussions covering science, religion, literature, etc. in the coffee houses. The authors also refer to literacy among artisans and industrial working class that taught one another to read creating self-education societies in the 18th century. From the late 19th century miners also developed self-education initiatives such as libraries and workmen's institutes that contributed to the development of a culture of the proletariat.

However, it was the 20th century that marked the people's right to access society's knowledge through the establishment of universities opened to anyone. In the second half of the 20th century, the developments in Distance Learning enabled by several universities around the world such as the British Open University, the University of

South Africa or the Indira Gandhi University in India provided education to remote areas thanks to the developments in communication technologies and mass media (Peter & Deimman 2013). In this brief historical journey on the main events that contributed, in the opinion of these authors, for the openness in education, not only aspects related to technology are mentioned, but also social, cultural and economic phenomena are emphasised.

As a conclusion, Peter & Deimman shed light on a selection of patterns that have emerged within different notions of openness and how they can inspire current open practices. The authors alert to the fact that "after a period of open movements many times there have been slight but important shifts from 'pure' openness towards 'pretended' openness, i.e. some aspects have been modified to offer more control for producers and other stakeholder" (2013, p. 12). With this idea the authors leave a warning for the risk to the shift from humanistic values of open education initiatives to more efficient and productive characteristics that may undermine the openness of education.

This leads us to the question: so what is the appropriate role of openness in education? Since the European Union's programme "Opening up Education" (European Commission [DG EAC], 2013), the term Open Education has being increasingly used and shaping most discourses, policies and activities that promote education as open as possible breaking down boundaries.

According to Wiley (2010) openness might play several roles in education which can be a core, peripheral, large or a small role. The essence of the openness in education, for this author, is the fact that openness is the sole means by which education is effected and if there is no sharing, then there is no education. In this sense Education is about being open, according to Wiley (2010). The introduction of the Information and Communication Technologies (ICT) has been intensively important in the sharing of knowledge without losing it, but the same thing does not happen with other material forms of knowledge.

The Internet allowed for us to have immediate digital expressions of knowledge that have, according to Wiley, the same "magical, non rivalrous quality as knowledge itself" allowing the ideas to be shared, without being given away. This ability represents a new way of sharing and learning. The argument of Wiley is that even though new media and technology have a critical role to play in education the only legitimate role for them in education is to increase our capacity to share knowledge with one another and be more open, highlighting the values of education: sharing, giving and generosity (Wiley, 2010).

In higher education, phenomena like globalisation, an aging population, institutional competition, technological development, are complemented by trends towards sharing software, learning resources, materials and research outcomes. This

movement towards to opening education to the world as accessible as possible is another of these challenges.

The increasing attraction that open education is gaining is due to online initiatives such as Open Education Resources (OERs) and Massive Open Online Courses (MOOCs), that attempt to widen access to education beyond the walls of traditional educational scenarios. Nevertheless, for Bayne et al. (2015) it is important to acknowledge the oppositional structure that suppose the existence of an education that is closed against the contemporary ideas of equity and accessibility. Even though there is as apparent consensus around the openness ideas in many areas besides education, motivated by the desire to exchange and share knowledge and to make it accessible, Bayne et al. consider that critical perspectives are urgently needed about what we mean when we use the term Open, how it is recognised and understood and how it influences policy and practices.

Introducing Gert Biesta and the idea of 'learnification' Bayne et al. (2015) refer that they believe that autonomous students, with independent activity that require educational opportunities through universally accessible materials and teachers to facilitate the process assuming we are "naturally open is a solution for the imagined autonomous subject. And is only imaginable where education is divorced from the complexities of culture, sociability, and the power of the political" (2015, p. 248). In other words, Bayne et al. try to alert to the various ways in which the 'the exciting landscape of openness' is expanding.

The same authors refer to the work of Edwards (2015), Hall (2015), Stewart (2015), Jones (2015) , Moe (2015) as some of the authors that develop critical approaches to open education around issues like: the exclusions built around all forms of education, even the open education; the political economy for MOOCs and the risk of becoming a neoliberal project and a valorisation of capital; the measurement of the academic influence in open scholarly networks of social media; the relation between openness and technology and the austerity politics which fails to view education as a public good; the boundaries between OER and branded video edutainment; or the perspective to bear on the failure of open education that focuses on the freedom of things, instead of freedom of people.

If we can identify a general consensus around the "openness" of education it is based on the idea that knowledge should be shared and disseminated through the Internet with as few restrictions as possible without any technical, legal or price barriers. These are some of the initiatives regarding sharing and reusing open source contents:

- Open Source Initiative - http://www.opensource.org/
- Open Content Initiative - http://www.opencontent.org/
- Open Access Initiatives - http://www.pubmedcentral.nih.gov/about/openaccess.html
- Creative Commons - http://creativecommons.org/

According to the report “Giving Knowledge for Free” (OECD, 2007) the potential implications of the OER movement accelerates the blurring of formal and informal learning, and of educational and broader cultural activities. It also raises basic philosophical issues to do with the nature of ownership, validation of knowledge and it reaches into issues of property and its distribution across the globe. This approach of sharing knowledge, is seen more and more as the key to economic success, for both individuals, institutions and nations.

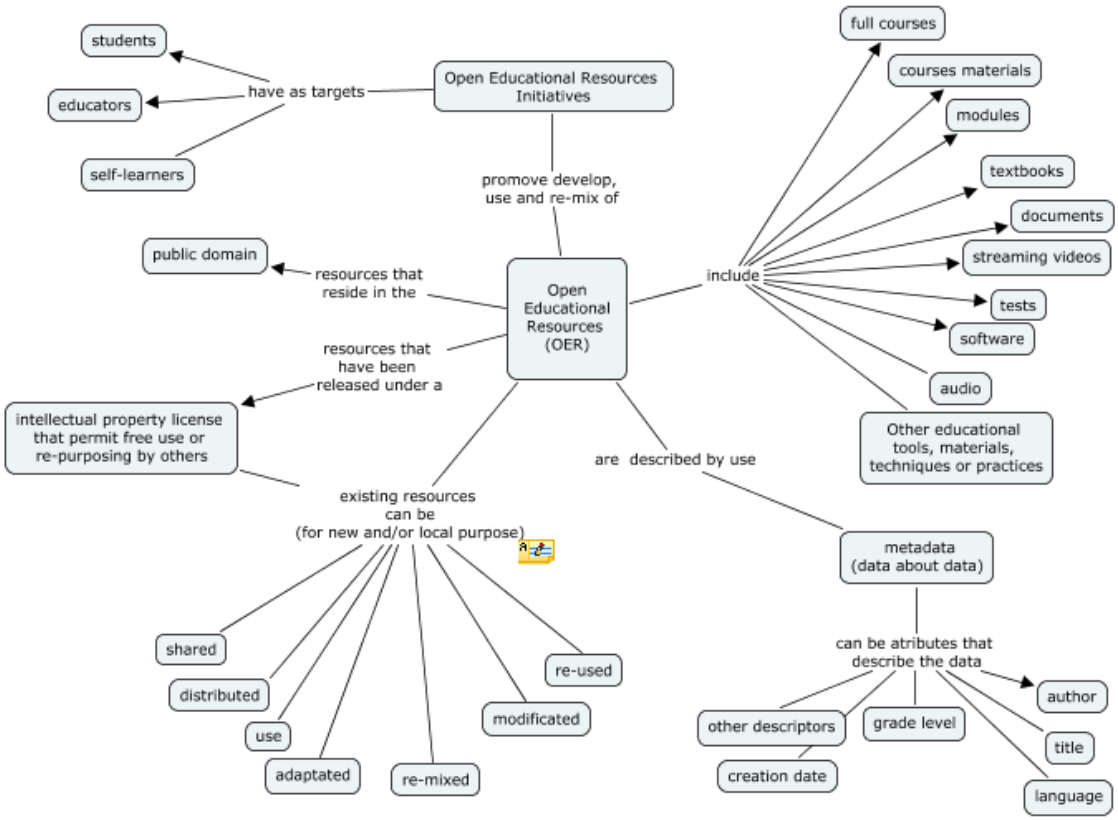
The Paris OER Declaration, adopted during the World Open Educational Resources (OER) Congress held in June 2012 at UNESCO Headquarters, was the first step for the development of policies supporting OER. The Declaration aimed at encouraging governments to contribute to the awareness and the use of OER and to develop strategies and policies to integrate OER in education.

UNESCO, in collaboration with the Commonwealth of Learning (COL), now wants to apply these guidelines and proposes to implement a series of global activities based on the 10 points of the Paris Declaration. UNESCO will organize, with the relevant stakeholders, advocacy and capacity building events, and will provide recommendations for developing educational policies supporting OER in 5 countries, representing 4 world regions.

1.2. Definitions of OER

The OER concept was first defined by UNESCO in the 1st Global OER Forum in 2002 where the term Open Educational Resources (OER) was adopted. According to the United Nations “Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation” (UNESCO, 2002). As shown in Figure 2, the diversity of materials which fall under the category of OER is quite vast.

FIGURE 2: Mind map of the OER/OCW Ontology



Source: N. Piedra *et al*. (2010).

In fact, when defining Open Educational Resources (OERs) The OLCOS Roadmap presents OER as a means of leveraging educational practices and outcomes and defines OER based on the following core attributes:

- that access to open content (including metadata) is provided free of charge for educational institutions, content services, and the end-users such as teachers, students and lifelong learners;
- that the content is liberally licensed for reuse in educational activities, favourably free from restrictions to modify, combine and repurpose the content; consequently, that the content should ideally be designed for easy re-use in that open content standards and formats are being employed;
- that for educational systems/tools software is used for which the source code is available (i.e. Open Source software) and that there are open Application Programming Interfaces (open APIs) and authorisations to re-use Web-based services as well as resources (e.g. for educational content RSS feeds).

The Open e-Learning Content Observatory Services (OLCOS) project was a Transversal Action under the European eLearning Programme which produced a roadmap to provide educational decision makers orientations and recommendations on how to

foster the further development and use of OER. Following the principles referred above, OERs can include:

- Open courseware and open contents;
- Open software tools like learning management systems, or any other tool;
- Training modules and courses materials;
- Text books, videos, tests;
- Learning objects repositories;
- Complete and free educational courses;
- Materials and techniques used to potentiate the access to knowledge;
- Games, simulations and other applications for learning;
- Evaluation tools and virtual material used with educational purposes.

These principles, according to the OLCOS Roadmap 2012 can bring about tremendous benefits for education and lifelong learning in a knowledge society and eliminate many inefficiencies in the current provision of e-learning opportunities.

The same document also defines a number of expected benefits of OERs from the viewpoints of educational networks, teachers and students. For educational networks (European, national, regional) and institutions, OER can (OLCOS, 2012, p. 20):

- Provide a long-term conceptual framework for alliances in the creation, sharing and provision of educational resources based on a strong emphasis of reusability;
- Allow for a higher return on investment of taxpayers' money (public funds) through better cost-effectiveness when reusing resources (e.g. sharing development costs among institutions or professional communities);
- Promote digital competence for the knowledge society beyond basic ICT skills through making available tools and content that allow learners to develop their critical thinking and creativity;
- Enrich the pool of resources (content and tools) for innovating curricula and teaching & learning practices, including resources from public sector information agencies, libraries, museums and other cultural organisations;
- Lead to a leverage in the educational quality of content through quality control, feedback and improvements within content alliances, communities and networks who share content (quality control through networks of developers and users has often been shown to bring good results);
- Foster lifelong learning and social inclusion through easy access to resources that may otherwise not be accessible by potential user groups.

From the viewpoint of teachers and students, OLCOS Roadmap (2012, p. 21) defines that OER can:

- Offer a broader range of subjects and topics to choose from and allow for more flexibility in choosing material for teaching and learning (i.e. content that can be easily modified and integrated in course material);
- Save time and effort through reusing resources for which IPR/copyright issues have already been resolved;
- Allow for engaging teachers in leveraging the educational value of resources through providing their own personal assessments, lessons learned and suggestions for improvements;
- Provide learning communities such as groups of teachers and learners with easy-to-use tools to set up collaborative learning environments (e.g. group Wikis or Weblogs, social networking, content feeds, etc.);
- Promote user-centred approaches in education and lifelong learning; users not only consume educational content but develop their own ePortfolios, and share study results and experiences with peers.

However, there are other definitions as well. The global non-profit organization that enables sharing and reuse of creativity and knowledge through the provision of free legal tools, known as Creative Commons, gathers some of the most interesting definitions of OER in its website.

> "OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge." **The William and Flora Hewlett Foundation**
>
> "Digitised materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning, and research. OER includes learning content, software tools to develop, use, and distribute content, and implementation resources such as open licences." **OECD (Organization for Economic Co-operation and Development)**
>
> "[O]pen educational resources should be freely shared through open licences which facilitate use, revision, translation, improvement and sharing by anyone. Resources should be published in formats that facilitate both use and editing, and that accommodate a diversity of technical platforms. Whenever possible, they should also be available in formats that are accessible to people with disabilities and people who do not yet have access to the Internet." **The Cape Town Open Education Declaration**
>
> "The term "Open Educational Resource(s)" (OER) refers to educational resources (lesson plans, quizzes, syllabi, instructional modules, simulations,

etc.) that are freely available for use, reuse, adaptation, and sharing." **The Wikieducator OER Handbook**

"Open Educational Resources are teaching and learning materials that you may freely use and reuse, without charge. OER often have a Creative Commons or GNU license that state specifically how the material may be used, reused, adapted, and shared." **OER Commons**

All these definitions have common characteristics linked to the OERs such as the right of access, adaptation, and republishing. Most of them highlight the need to OERs to be non-discriminatory (rights given to everyone, everywhere). Some of the definitions mention the fact that OERs do not limit use or form and that open copyright license is required.

This gives rise to some ambiguity with regard to the definition of OER, or even the concept of openness and what makes a resource, educational. Even among the main institutions that study and analyse these phenomena, consensus is not widespread. For instance, OLCOS has gathered expert opinions and suggestions on open digital educational content but does not provide its own definition of Open Educational Resources. OLCOS' approach does not primarily emphasise open educational resources but open educational practices. In the UNESCO forum and OECD there is an emphasis on the sharing among educational institutions of "courses" or "course content" (OLCOS, 2012).

According to these perspectives, we can consider OERs as digital materials (including multimedia) that have a potential educational value and are shared and published freely and openly through the Internet using open licenses or residing in the public domain to be used by educators, students and self-taught learners. (White, D. & Manton, M., 2011).

In a simpler way, Martinez (2014) highlights the idea behind OERs the following way: educational materials that can be used freely with almost without any conditions, accessible, reusable and available at no-cost. In accordance, even though there is not an official definition of the term OER the most often definition used is "digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research" (OECD, 2007).

If we take a close look at the term resources, according to OECD they are not limited to content but also comprise three more areas: Learning content (Full courses, courseware, content modules, learning objects, collections and journals); tools: Software to 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 referred by Yuan, MacNeill

& Kraan, 2008). These three areas have been present in several initiatives undertaken by higher education institutions. OERs can include therefore a number of quite different formats.

But there are other approaches to OERs definition. Wiley, Bliss & McEwen (2014) state that rather than try to define the entire term open educational resources, some researchers define its components separately. In this sense they refer to Hylén (2006) who problematizes each of the three concepts in the name, questioning what is meant by “open”, “educational,” and “resources,” as do Mulder (2007) and OECD (2007).

Wiley (2010) assumes a common understanding of the term educational resources, and argues that open is a matter of cost and copyright licensing and related permissions. He also refers that the actions that operationalize the concept of openness in education although are present in different nouns such as content, resource courseware or textbook, they all share an act of generosity, sharing and giving (Wiley, 2010). In essence these OER actions are provided for free under a copyright license that grants permission to the user to *reuse*, *revise*, *remix* and *redistribute* teaching and learning resources. These are known as the four R’s framework that are specified in Open Content Web and that express the permissions and rights to OER users (Wiley, 2010). More recently, Wiley has added a 5th "R", which stands for *retain*. Accordingly, an education resource is considered to be open if the users have the right to:

- ***Retain*** – the right to make, own, and control copies of the content
- ***Reuse*** the content in its original unaltered form (for example, making a backup copy of the content);
- ***Revise*** or adapt, adjust, modify or alter the content itself (for example, translating the content into another language);
- ***Remix*** or combine the original content with other content to create something new (for example, incorporate the content into a *mashup*)
- ***Redistribute*** or share copies of the original content, the revisions, or the remixes with others (for example, give a copy of the content to a friend).

OERs can thus be more or less open depending on the constraints and conditions applied to each of the 5R activities. Finally, we synthesize all these definitions, based on the contribution of the Educause Learning Initiative that published a basic guide (2010) containing 7 things you should know about OER, namely:

1. Open educational resources (OER) are any resources available at little or no cost that can be used for teaching, learning, or research.
2. The term OER generally refers only to digital resources and, as such, tends to focus on usage in online or hybrid learning environments, though electronic content can certainly be used in face-to-face environments as well.

3. Following MIT OpenCourseWare all around the World universities followed the same model and other OER efforts include Connexions, which was begun at Rice University, and the Open Learning Initiative from Carnegie Mellon, as well as the University of the people and even iTunes U. Although OER projects use different models for how they function, all endorse the notion that teaching, learning, and research are improved when educational resources are more open and more accessible.
4. Educational resources developed in an open environment can be vetted and improved by a broad community of educators, resulting in materials that represent what the educational community sees as most valuable.
5. The quality of OER is variable and depends largely on their sources. Some OER are simply ineffective at presenting content in a valuable manner, and not all OER collections have a feedback mechanism by which users can share their evaluations about the quality of a resource.
6. The abundance of OER can leave users spending a long time searching for a resource that fits their needs, and the volume of OER will only increase. OER repositories and the tools to search for and filter resources will need to build out their capacities and capabilities to help navigate the growing sea of open content.
7. Few disagree that the infusion of OER into higher education is likely to have far-reaching effects on the character of teaching and learning, though the nature of that change is the subject of some debate.

1.3. Status of dissemination in Europe and Latin America

According to Costa & Leite (2016) in Latin America, discussions and systems have taken place around the issue long before the Budapest Open Access Initiative (2002), and the strongest initiative in favour of open access was the Brazilian Manifesto to Support Open Access to Scientific Information in 2005. Also in 2005, the "*Salvador* Declaration on Open Access: the perspective of developing countries" was published, prepared by the participants of the International Seminar on Open Access. It emphasized the expectation of increase in open access in developing countries and, as a result of this, the possibility of researchers to access literature and science.

Later in 2005, in Brazil, a manifestation of support for Open Access was published, known as "*São Paulo* Letter". The Declaration of *Florianópolis* was drafted in 2006 by Brazilian researchers in the field of psychology to express their support for open access to peer-reviewed literature. Following these initiatives many other documents were released in Latin America with the same purpose.

Costa & Leite (2016) highlight the *Declaración de Cuba en favor del acceso abierto*, in 2007. The bill nº. 1120 was submitted to the Brazilian Congress in 2007 proposing the creation of a national law for mandatory development of IR by the higher education institutions and public research centres and later a similar Bill was submitted. Both are

still in progress in various agendas of the committees. A similar initiative was identified in Argentina, in 2011, when the National System of Digital Repository was created through a ministerial resolution. The Red Mexicana de Repositorios Institucionales (ReMeRI) was created in 2011.

In 2012, the *Red Federada Latinoamericana de Repositorios Institucionales de Documentación Científica en América Latina* (LA Referencia) was launched to promote the creation of a regional strategy for institutional repositories. Later that year, Latin America, through the LA Referencia, joined the Confederation of Open Access Repositories (COAR) which is an association of academic institutions and research of European, Asian, North American and Latin American countries that aims to strengthen the global networks of open access repositories (Costa & Leite, 2016).

In 2013, the bill nº 30035 for open access was approved in Peru to regulate the *Repositorio Nacional Digital de Ciencia, Tecnología y Innovación de Acceso Abierto*.

According to Costa & Leite "the performance of Latin America in regional networks can be explained due to the specific characteristics of the region, which differs from countries in North America and Europe" (2016, p. 42). One of these characteristics, following the contributions of Costa & Leite, is the lack of growth to ensure a good infrastructure for information systems, as the Internet was available to only 22.1% of the population until 2008. The context of the Latin American countries is also important to understand the resources available and the historical and cultural aspects.

SECTION 2. OBJECTIVES

The main goal of this report is to develop an exploration about the relation between OERs and MOOCs, including aspects related to the reuse of OERs and its ownership. This information will allow to characterize present scenarios that may serve as background for the actions undertaken in the MOOC-Maker Project.

The project is intended to carry out a qualitative research based on bibliographical analysis covering scientific peer-reviewed journal articles and relevant reports of official sources that focused not only on OERs' roles and definitions but also the analysis of OER main activities and manifestations, and quality and pedagogical issues related to the use of OERs and MOOCs. This report intends to serve as background for future open education practices, improving scenarios and predicting challenges and potentialities.

The main objective is to study is to explore the actual role of OERs and its relationship to MOOCs. In particular, it aims at:

- Identifying the role of openness in education and the definitions of OER;

- Characterizing the status dissemination of OERs in Europe and Latin America;
- Identifying and characterizing the main initiatives of OER in the world;
- Exploring and analysing the core elements related to the use and reuse of OERs;
- Characterizing and analysing the relationship between OERs and MOOCs.

SECTION 3. METHODOLOGY

For the purposes of this report a qualitative approach has been applied, incorporating an analysis of peer-reviewed journal articles and official reports on OERs initiatives. The main steps undertaken in the research were:

- Exploration and identification of relevant authors, peer-reviewed articles and official reports of scientific relevance on OERs research;
- Document analysis of the selected documents;
- Critical analysis of documents;
- Conclusions and final remarks.

The research questions that orientated this analysis were the following:

- What is the role of OERs in education nowadays?
- Which critical issues are addressed in theoretical debates and reflections on OERs?
- How OERs are used and reused in MOOCs?

The work was developed in three phases. The first phase aimed at gathering the theoretical evidence from the OER community and published research. A significant number of documents was selected, especially scientific journal articles and reports from official sources, that addresses themes such as: OERs definition and role, OERs initiatives, OERs usefulness and the relationship between the use of OERs in MOOCs.

After this selection a second phase was developed concerning the analysis of the documents based on the themes outlined above.

The third phase of the work was based on the exploration of some critical issues, also based on the themes previously mentioned, emphasising the use of OERs in MOOCs.

SECTION 4. THE THREE GENERATIONS OF OER

Over the past decade several investments have been in OER initiatives all over the world. Atkins, Brown & Hammond (2007) give some highlights and examples of successful investments in OER, such as:

- The MIT OpenCourseWare Project - project emerged from MIT faculty and administrators who wanted to use the Internet to provide free access to the primary materials for virtually courses.
- The Connexions Project - Connexions is an environment for collaboratively developing, freely sharing, and rapidly publishing scholarly content on the Web.
- Utah State University - Utah State University has been a major grantee in the OER program as a provider of open content and as a free source of open learning support through the Centre for Open and Sustainable Learning (COSL).
- Carnegie Mellon Open Learning Initiative - The Carnegie Mellon Open Learning Initiative (OLI) adds a focus to the OER portfolio on instructional design grounded in cognitive theory, formative evaluation for students and faculty, and iterative course improvement based on empirical evidence.
- Creative Commons and Internet Archives - with a watermark of share, reuse, and remix, legally, Creative Commons is a critical infrastructure service for the OER movement providing free tools for authors, scientists, artists, and educators easily mark their creative work with the freedoms they want it to carry.

As such, a variety of different approaches on how OER are designed and used have emerged. Teixeira (2012) identifies three different generations of OER, each with its specific focus on quality, as presented in Tables 1 and 2.

TABLE 1: Types of Open Content Resources Available.

1st Generation	Open Courseware	Free access to materials produced by high-profile education institutions in order to support face-to-face teaching
2nd Generation	Open Content Resources	Free access to materials produced by single or network education institutions or editors in order to support autonomous independent learning in the context of open learning, distance learning or *e-learning*
3rd Generation	User Generated Content	Free access by expert individuals or organizations to materials produced for independent learning for use and redesign

Source: A. M. Teixeira (2012)

TABLE 2: Quality Criteria Focus in OER.

1st Generation/Level	Content reputability and technological access	Focus in early days was on the scientific value of the materials and the their technological accessibility
2nd Generation/Level	Learning design and student support	Focus shifts to the pedagogical value of the materials and how they are prepared to allow for significant learning experiences
3rd Generation/Level	Assessment and collaboration	Focus is now on assuring validation of learning experiences and how they generate massive interaction

Source: A. M. Teixeira (2012)

In the following sections we explore more in depth the specific features of each of this different types of OER.

4.1. Open Courseware

The learning content known as open courseware, refers to educational material organised as courses and typically distributed as PDF files, as well as smaller chunks of learning, often referred to as learning objects. The content may involve websites, simulations, text files, images, sound or videos in digital format, some only for use and others open also for adaptation and reuse (OECD, 2007).

As Martinez (2014) mentions the development of OpenCourseWare (OCW) was based in the idea that educational materials can be used free of charge and almost without any restrictions and all its materials were available with Creative Commons Licenses. In the beginning of OCWs in 2002 in MIT the aim was not to develop a commercial product but to stimulate knowledge transference from university to society making professors use Open Educational Resources (OER).

According to Lerman, Miyagawa and Margulies (2008) OCW is a free and open Web publication of course materials created by faculty to support teaching and learning. The same authors believe that the OCW concept will promote and widely accepted culture of open sharing and will become a more customary practice in Education at all levels.

Caswell, Henson, Jensen & Wiley (2008) present an overview of OpenCourseWare development. OpenCourseWare (OCW), an initiative within the Open Educational Resources movement, finds its origins in the free software movement. According to this overview in 1983, Richard Stallman announced the foundation of the GNU project housed within the MIT Artificial Intelligence Lab to build Unix-compatible software and share it freely with anyone. After Stallman's plan community approach became increasingly prevalent with software developers. In 1991, Linus Torvalds used GNU

tools to develop Linux, a popular open source operating system built on the same open principles (Caswell, Henson, Jensen & Wiley, 2008).

The same authors continue referring that in 1998, David Wiley announced the first open content license. This license was based on the premise that educational content should be freely developed and shared "in a spirit similar to that of free and open software" (Wiley, 2003). The idea became popular quickly and Stallman announced the GNU Free Documentation License (GNU FDL) in 2000. In 2002, Creative Commons released their first set of copyright licenses so that content producers license their content for reuse.

Wikipedia, was launched on 15 January 2001 and in 2002 the Massachusetts Institute of Technology (MIT) launched a phase one pilot OCW that in 2007 became a website offering 1800 courses at MIT.

Projects as the Internet Archive (see http://internetarchive.org), Project Gutenberg (see http://gutenberg.org), Wikipedia (see http://wikipedia.com), Creative Commons (see http://creativecommons.org), Sun Microsystems Global Education Learning Community (see https://edu-gelc.dev.java.net/nonav/index.html) and the OpenCourseWare Consortium (see http://ocwconsortium.org) became core to the Open Educational Resources movement.

For any course the published materials should convey parameters of the course's subject matter and include most of the materials used in the course (Lerman, Miyagawa and Margulies, 2008). According to the authors the content may include:

- Planning materials such as syllabus, calendars, pedagogical statements;
- Subject matter content, such as lecture notes, reading lists, full-text readings, video/audio lecturers;
- Learning activities like problem sets, essay assignments, quizzes, exams, labs, projects.

One important remark is that OCW is not a distance education program nor an online, mediated learning system. It is a publication targeted at educators, students and self-learners. Educators may adopt or adapt materials for teaching purposes. Students may use the materials for reference, practical exercises or to map programs of study. Self-learners may use to materials to enhance their personal knowledge.

To achieve this, one key-feature of OCW is that the materials are IP-cleared (Lerman, Miyagawa and Margulies, 2008) which means that the ownership is licensed by the institution that assures the rights to make the materials available under open terms and guarantees that the copyrights of others are not infringed.

Nowadays, the OpenCourseWare project from MIT is still the most expanded OER initiative and today OCW features all of the course materials from almost 2,000 MIT

courses. The OpenCourseWare model has been adopted by several universities around the world, which are putting full course materials online for anyone to use. This is not intended to be equivalent to taking a course at that institution, but users can take advantage of that access in their own learning.

4.2. Open Content Resources

Atkin, Brown & Hammond (2007) refer to open code and content as a part of a larger openness movement that may be relevant to the future of OER and beyond. The authors consider that Openness includes development and adoption of open standards and open innovation which involves limited open sharing between firms for some collective good but not necessarily for the public good.

Open Content and OER are less open because of the requirements and restrictions in open licenses. There is not a general consensus about the inclusion of these restrictions and requirements. While some consider them to be important for instance in cases where to non-commercial restrictions is desirable, for others these restrictions go against the essence of the Open Content definition. Creative Commons is the most important provider of open licenses for content and offers licenses that prohibit commercial use.

Wikipedia, one of the most important collections of open content, requires all derivative works to adopt a specific license and MIT OpenCourseWare, another of the most important collections of open content, requires all derivative works to adopt another specific license. Both sites clearly promote the open content but the requirements and restrictions tend to narrow the goals of the open content community. In other words, these open content publishers make technical choices that unable the user's ability to engage in those open content activities.

4.3. User generated Content

User-generated Content (UGC) is the term used to describe any form of content that was created by consumers or end-users of an online system or service and is publically available to others consumers. This UGC can assume various forms such as videos, blogs, audio files, digital images, etc.

“User-generated content comes from regular people who voluntarily contribute data, information, or media that then appears before others in a useful or entertaining way, usually on the Web - for example, restaurant ratings, wikis, and videos” (Krumm, Davies & Narayanaswami, 2008, p. 10).

Dijck (2008) states that with the emergence of Web 2.0 applications, most prominently UGC platforms users are generally referred to as active internet contributors, who creatively produce and consume in an online platform or system. According to Dijck various academics denote how users ‘agency hovers between the bipolar categories of

producer versus consumer, and of professional versus consumer. But the author defends that new hybrid terms such as 'produser' and 'co-creator' have meanwhile entered academic discussions and the user agency is a lot more complex than these bipolar terms suggest. For Dijck we need to account for the multifarious roles of users in a media environment where the boundaries between commerce, content and information are currently being redrawn. To illustrate the complexity of user agency, the authors analyses the recent development of YouTube (Dijck, 2008).

SECTION 5. OER USE AND REUSE

The open in OER is referred to the mean the resource is available for other people to use in several contexts, but the reuse describes several types of use, and its definition is not consensual (Downes, 2007). As referred by Beaven (2013) the twin concepts that underpin OER are sharing and reuse, but how are these elements characterized?

5.1. Findability, accessibility and usability of OERs

Findability determines how the users find what they need. It is one of the aspects considered by Information Architecture (IA) in web design along with how the users accomplish tasks and how they understand the content distribution on the website. Users with disabilities can use OER but under accessibility condition but the website must meet accessibility principles, and the resources must be accessible on depending their formats.

McCracken (2006) states that, by having access to publishing and production tools, and by licensing access to a digital product rather than a physical object, consumers now interrelate with licensing as never before. Nevertheless, they are unprepared or unwilling to engage licensing procedures. For this author the logic that underlines the users that access open content via technologies is: "if something is technically possible, then why is it not also legally possible? "(McCracken, 2006, p.1).

The Web Accessibility Initiative (WAI) develops strategies, guidelines, and resources to help make the Web accessible to people with disabilities. According to the principles of this initiative it is essential that the Web be accessible in order to provide equal access and equal opportunity to people with diverse abilities as a basic human right. Accessibility supports social inclusion for people with disabilities as well as others, such as older people, people in rural areas, and people in developing countries.

The Web Content Accessibility Guidelines (WCAG 2.0) is the result of the recommendation from the Web Content Accessibility Guidelines Working Group. Within these guidelines a set of four principles are established in order to make the Web accessible to everyone including people with disabilities. These principles are as follows:

- **Perceivable** - Information and user interface components must be presentable to users in ways they can perceive: Text alternatives for non-text content; Captions and other alternatives for multimedia; Content can be presented in different ways; Content is easier to see and hear;
- **Operable** - User interface components and navigation must be operable:
    - Functionality is available from a keyboard; Users have enough time to read and use the content; Content does not cause seizures;
    - Users can easily navigate, find content, and determine where they are;
- **Understandable** - Information and the operation of user interface must be understandable: Text is readable and understandable; Content appears and operates in predictable ways; Users are helped to avoid and correct mistakes;
- **Robust** - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive Technologies: Content is compatible with current and future user tools.

Concerning usability, Whitfield & Robinson (2012) refer optimising the usability of the teaching and learning materials produced is one of the most important challenges involved in developing OERs. The authors state that the audience/users of the resources are inevitably unknown and there may be multiple potential end-users, ranging from students, to self-learners, to educators. In this sense, for Whitfield & Robinson (2012) it is important to make the distinction between a teaching resource of use to a teacher in disseminating information, e.g. lecture outlines) and a learning resource (used directly by students and acting as a surrogate for a classroom teacher) with different instructional design and content requirements. But instructional design and content are not the only factors determining resource usability. According to these authors, presentation and user interface are also important and software requirements are an important consideration with regard to the availability of resources to end users (Whitfield & Robinson, 2012).

5.2. The importance of open licensing

One of the most important elements of OER is the permission to use resources in different ways and scenarios. The way an OER is licensed affects its openness, which means that authors take explicit legal steps to open their creative works. This issue is obviously surrounded by controversy regarding the benefits and disadvantages of licensing resources to be open for use and reuse.

McCracken (2006) defines benefits and disadvantages for the licensing system. Regarding the benefits, the author identifies the following:

- it introduces certainty and clarity into the process of obtaining permission to use the work of others;

- it reduces the administrative burden of having to clear, which is particularly useful in the educational context where users have little or no inside knowledge of the mechanisms used by the media industries;
- It establishes a body of works licensed as “open content” that may be freely shared.

In what regards the disadvantages McCracken (2006) states that:

- Rights holders must be prepared to grant and to live with exercising only a fictional control over their works, replacing other forms of control with which they are familiar;
- Moral rights are waived under licences offering the right to make derivative works;
- Different and often blurred and overlapping boundaries emerge between not-for-profit, educational and commercial exploitation or distribution.

The opportunities offered by open content are driven by a number of socio-cultural factors reflecting how the individual or institution balances the advantages and disadvantages of open licensing (McCracken, 2006).

The most commonly used open licenses are the Creative Commons licenses. It was professor Lawrence Lessig and a group of colleagues from Stanford University in the USA that came up with the idea of Creative Commons, because the technology offered at the time was all about negotiability of copyright material under law (Fitzgerald, 2007).

“Lessig’s vision was for a space in the Internet world where people could share and reuse copyright material without fear of being used – creative commons. In order to achieve these creative commons a simple yet very effective licensing model, drawing inspiration from the free software movement, was born. The idea was to ask copyright owners, where they were willing, to agree or give permission for their material to be shared through a generic license that acted as permission in advance”. (Fitzgerald, 2007, p. 1).

An open educational resource is any educational material that uses a Creative Commons license or resides in the public domain (i.e., outside of copyright regulation). For Wiley, Bliss & McEwen (2014) the Creative Commons licenses are comprised of several components which can be mixed in a number of ways. There is the “Attribution” component (BY) that requires individuals and organizations that use the openly licensed material to give credit to the original creator of the material. The “ShareAlike” component (SA) requires any revised or adapted versions of the material to be licensed under exactly the same Creative Commons license as the original material. The “Noncommercial” (NC) component prohibits individuals and organizations from using the material for commercial purposes. According to the

authors these components can be mixed in a number of ways to make different licenses. Creative Commons also provides a "No Derivatives" component (ND) which prohibits individuals or organizations from making any changes to materials, (Wiley, Bliss & McEwen, 2014).

5.3. Assuring quality in OERs

Quality in OER is also an important issue for educational institutions because the materials exposed reveal their teaching and learning capacities and competences in certain disciplines and scientific areas. The quality aspects are related to technical and pedagogical contours of OERs that must be guaranteed by educational institutions through the definition of quality measures and instruments.

The term quality is very difficult to define, but in OERs it is usually related to accuracy, reputation of the author or institutions that publishes it, the technical standards, the accessibility and the purpose for the resource to be open.

Camilleri, Ehlens & Pawlawski (2014) produced a report for the European Commission in 2014, presenting a state of the art review of quality issues related to OER. Assuming that quality is an amorphous concept, and not an objective entity, the authors present a conceptual map of issues affecting OER Quality, and a conceptual map for the notion of quality itself.

They consider quality to be a confluence of the following concepts: Efficacy, Impact, Availability, Accuracy and Excellence. *Efficacy* in regard to the fitness for purpose of the object / concept being assessed. *Impact* is a measure of the extent to which an object or concept proves effective; the concept of *availability* is a pre-condition for efficacy and impact to be achieved, and thus also forms part of the element of quality. *Accuracy* is a measure of (a) precision and (b) absence of errors, of a particular processes or object; *Excellence* compares the quality of an object or concept to (a) its peers, and (b) to its quality-potential, i.e. the maximum theoretical quality potential it can reach (Camilileri, Ehlens & Pawlowski , 2014).

In this report report Camilleri, Ehlens & Pawlowski (2014) focus on specific quality instruments, applicable to OER. Based on Pawlowski et al (2013) the authors discuss different levels and aspects of quality which they consider to be relevant to managing quality in OER:

- **Quality of Organizations** - quality management approaches are equivalent to accreditation, meaning that certified organizations have processes in place to develop high-quality programmes, courses and modules and thus OER.
- **Quality of Courses** - according to this report there are many quality approaches to course and programme certifications which take into account quality notions. Key features in content are assessed automatically such as

metadata quality, language and grammar, tag quality as well as essential elements (learning activities, media usage, and technical correctness). The authors highlight the fact that when content changes rapidly and dynamically, it is essential to plan incremental quality checks.

- **Quality of Metadata** - through simple automated feasibility checks metadata are assessed for spam and inappropriate content and validated against given taxonomies (contents, curricula, didactics, and context).
- **Individual Quality** - as quality is not a generic concept, users only receive OER fitting their context. Based on user behaviour and comments, users receive high-quality objects for their context**.**
- **Transferability and Adaptability** - this is a key quality attribute regarding adaptation of language, culture, design, didactics etc.

The author added some quality aspects that must also be incorporated in the quality of the instruments themselves: Transparency of procedures used to assess quality; Independence of bodies assessing quality from the producers of quality; Reproducibility of quality assurance procedures; Auditability of quality assurance processes; Comprehensiveness of quality audits.

Based on these assumptions Camillieri, Ehlens & Pawlowski (2014) propose a conceptual framework with three 'sets' of quality approaches, and two sets of quality instruments for OER.

The quality approaches outlined are:

- **Quality Assurance of Resources** – the authors present a lifecycle model to understanding the quality factors affecting individual resources, including their creation, use and evaluation.
- **Quality Assurance of Strategies / Policies** – using a maturity model, the authors consider the institutional development of policies which govern and promote the creation of OER.
- **Quality Assurance of Learning** – this focuses on course-specific quality assurance, including processes of teaching, assessment and recognition.

Regarding the quality instruments Camillieri, Ehlens & Pawlowski (2014) propose:

- ***Tools and Tool Practices*** are the methodological and technical tools which allow for quality assurance to be performed.
- ***Collaborative and Partnership Models*** describe the human element, in the form of trust networks that underpin the quality assurance models.

In this report, Camillieri, Ehlens & Pawlowski (2014) argue that quality assurance of OER requires a complex mix of quality tools that enable many more users to be

involved in the quality processes, and for a greater variety of learning scenarios to be taken into account.

SECTION 6. OERs AND MOOCs

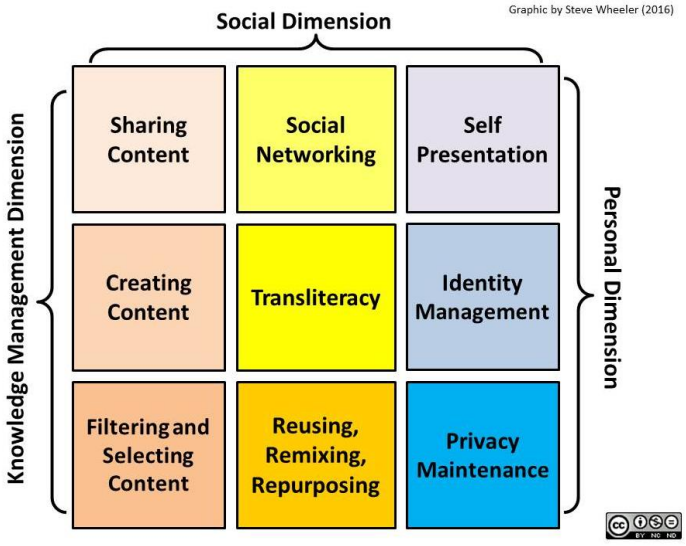
6.1. The emergence of Open Educational Practices

Learners today are different. New educational needs have emerged as society transforms. Vrasidas (2015) suggests nine central life skills in contemporary society, as shown on Figure 3. Wheeler (2016) has proposed the focus of digital literacies should be on transliteracy, as can be seen on Figure 4. Basically, the focus as well as the format of learning has changed as a consequence of the societal structural transformation.

FIGURE 3: Life Skills.

Source: Charalambos Vrasidas (2015)

FIGURE 4: Digital Literacies.



As shown in Table 3 below, the focus as well as the format of learning has changed as a consequence of the societal structural transformation.

TABLE 3: Learning in a Networked Society

21st century learning	Traditional learning
• Learner-centred • Personalized • Flexible • Social/collaborative nature • Challenging • Contextual • Lifelike, authentic • "Gamified" • Questioning/creating knowledge • Experimenting; mistakes as learning opportunities • Problem solving • Artefacts/complex objects/ePortfolios	• Content-centred • Uniform • Rigid • Highly structured • Centralized • Competitive nature • Academic, curricular • Memorizing/reproducing information • Mistakes as failure; fear of experimenting outside the given parameters • Tests / Exams

Source: A. Teixeira & J. Mota (2015)

Technological innovation has in fact brought us closer to new educational practices that restructure, adapt and develop the learning systems in a very different way from tradition. Informal learning is becoming ever more pivotal in how we acquire and share knowledge. Moreover, new forms of social usage (not just digital, but also net-based) have been emerging and developing in an astonishing way (Herrera, 2011).

As a consequence, Siemens (2004), one of the founders of Connectivism, proposes a new vision of learning whose basic principle is the decentralization of information due to the diversity of the emerging technologies. To a certain extent, this author argues that in a technological context the learning process is different. It is based on discovering and experimenting connections with sets of specialized information rather than to acquire structured content.

Based on the main ideas of connectivism, Dave Cormier (2008), with his approach to "rhizomatic education", develops a more flexible understanding of knowledge in the era of networked society. Rhizomatic learning is thus negotiation of knowledge, open learning, directed by each and all at the same time. Its ramifications are unpredictable and continue to grow throughout life.

As a way to respond to learners today, many institutions have considered alternative ways of educational delivery, including distance learning and eLearning. Distance and open learning with a philosophy flexible and open turns education accessible to people who are not covered by conventional universities (Alfonso & Garcia, 2015).

The OERs are part of a wider trend towards opening up higher education based on the philosophy that knowledge should be freely available on the internet and without costs to the user (Murphy, 2013). However, the potential of these resources to transform the practice has not yet been achieved. In a first stage, it was invested in the dissemination and development of resources with a focus on access and availability (Ehlers, 2011). Despite this, their use has continued to not follow the supply available and their reuse scarce (Teixeira, 2012).

Despite the different definitions that exist and the absence of agreement on policies, the open practices has been scattered on a global level. As an example of this dissemination we have MIT OpenCourseWare and the OpenStax CNX (formerly Connexions) in the USA and the OpenLearn in UK, among others. In fact, the potential of open content and their practices to transform the educational landscape on a global level has been described as immense (Olcott, 2012 cit in Armellini & Nie, 2013). However, it appears that only a fraction of the higher education institutions at a global level are involved in the publication of OERs (Armellini & Nie, 2013). According to Murphy (2013), this potential is not realized is due in large part to the lack of focus on policies and practices required for a promotion of openness in higher education institutions.

Thus, there was a second phase which focused on the use of OERs as a way of improving the learning experience and innovate the educational scenarios, including the formal environments. The emergence of open educational practices (OEPs) resulted precisely from the combination of using OERs and architectures of open learning with the potential to create learning environments in which is given to learners the opportunity to develop independently and self directed their own learning path. The OEPs can be defined as practices that sustain the (re)use and production of OERs through institutional policies while promoting the development of innovative pedagogical models and at the same time respect and empower learners as co-producers of their own learning path (Ehlers, 2011; Teixeira, 2012).

Geser (2007) agrees with the emphasises on the importance of open education practices based on a competency-focused, constructivist paradigm of learning in order to promote a creative and collaborative engagement of learners with digital content, tools and services in the learning process. The question, for Geser, is how to promote those practices through targeted and sustained efforts.

6.2. A cultural shift in Education – From closed to open learning architectures

Traditionally, Internet-based education has been dominated by standardized and commercial tools that integrate different utilities for managing content and people. These tools, known as Learning Management Systems or LMS are based on closed systems, with many functionalities but whose architecture makes it very difficult to adapt them to specific needs outside those predefined by the system itself. These systems were initially designed to make it easier for administrators and teachers to

manage and organize virtual courses, but LMS have basically became virtual extensions of classroom training spaces (Weller, 2005).

With the emergence of Web 2.0 and social tools, the concept of a learning platform or LMS as a monolithic element and unique hosting center for online training has been abandoned. As Freire (2009) suggests, all the functionalities typical of conventional LMS can also be developed with Web 2.0 tools which also allow creation, management, collaboration and publication without the users needing great technical knowledge.

This technological transformation accompanies and, to a certain extent, causes other processes of cultural change much more relevant. For example, the adoption of decentralized web 2.0 tools creates a conflict between institutions and users as the control structures over people's contents and activities change. In any case, the transition from closed to open systems and from centralized to distributed architectures facilitates the strengthening of forms of learning that emphasize student initiative and its creative and innovative capabilities.

Thus, in these new models students as a learning strategy must act more and more as partners and peers of the teacher in the construction of knowledge. Students must actively participate in the learning process, and collaborate with each other as well as with teachers working individually and as a team. Teachers radically change their traditional role while they diversify the ways in which they participate in the learning process by taking the roles of consultants and information facilitators, learning facilitators, media designers, virtual and/or face-to-face moderators and mentors, counsellors, and continuous evaluators.

The philosophy of the Open Learning Movement is materialized in the MOOCs (Massive Open Online Courses) which gather three basic principles of our network society: freely, scalability and ubiquity. As proposed by Waard et al. (2011), these courses are by definition open and online in order to allow as many participants as possible with the option of free and open enrolment, have a publicly shared curriculum and accessible resources, and are facilitated by leading professionals in the field of study.

An alternative definition, by the OpenupEd initiative, describes a MOOC as "an online course designed for large number of participants that can be accessed by anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free" (Brouns et al., 2014). This definition has been validated amongst European institutions (Jansen et al., 2015). Recently, the ECO sMOOC pedagogical model defines MOOCs as full/complete courses which should not only include educational content but also facilitate interaction among peers (including some but limited interaction with academic staff), provide authentic activities and tests, including feedback (with well-designed rubrics for peer-assessment and AI engines for the integration of massive

qualitative assessment), have some kind of (non-formal) recognition options and provide a study guide or syllabus (Brouns et al., 2014).

MOOCs started as a demonstration of the new connectivist educational theory principles. The connectivist-inspired approach highlighted the disruptive and networked nature of the learning experience (Bates, 2015). These courses are known as cMOOCs for connectivist oriented (Roscorla, 2012; Siemens, 2012a). According to the connectivist principles of learning (Downes, 2012; Siemens, 2012; Cormier, 2010), which are based on a participatory pedagogy and on networked learning, there is not a fixed body of content to be learned, "professors" teaching "students" or a single location where the course took place. Content results from the production of artefacts by participants, following their interaction with and their reflection upon a given set of resources (and other resources shared by them or by others), as well as the dialogue among participants around these artefacts; the organizers acted more as facilitators and providers of some necessary structure, with the "teaching" role being assigned to the learning community itself; and, while there was a course site, with the relevant information (weekly topics, list of suggested resources, synchronous session schedule, etc.) and Moodle forums where people could interact, the conversation was distributed by the participants' own spaces (mostly individual blogs) and several social network spaces (Teixeira & Mota, 2014).

However, the international wide impact of the MOOC phenomena is mostly linked with the initiatives led by the most prestigious universities in the United States (US) which focused on the potential of open online courses for massive scale distribution of high quality scientific content and for popularizing star professors and top institutions. This traditional learning approach is known as xMOOC. However, the phenomena of MOOCs is a rather complex one as it results from different kind of approaches. This fact has important consequences in the diversity of formats used and also features as well as the true nature and purpose of the educational experience they provide.

In fact, although the above mentioned cMOOC and xMOOC approaches seem to be dominant, other alternative formats have been emerging. Clark (2013) identified eight types of MOOC. On the other hand, Conole (2013) highlighted a dozen dimensions on which a course could vary. These include the degree of openness, the scale of participation (massification), the amount of use of multimedia, the amount of communication, the extent to which collaboration is included, the type of learner pathway (from learner-centred to teacher-centred and highly structured), the level of quality assurance, the extent to which reflection is encouraged, the level of assessment, how informal or formal it is, autonomy, and diversity.

Recently in Europe many collaborative, social pedagogic models have been developed (Jansen et al., 2015). The first one of these was the iMOOC model (Teixeira and Mota, 2013), which later inspired the sMOOC model developed in the framework of the EU-funded project *Elearning, Communication and Open-data: Massive Mobile, Ubiquitous and Open Learning* (ECO). In addition to variations in the pedagogical design, other are

based on the adaptation of the MOOC concept to special contexts in which some of its typical elements do not verify, as for instance scalability and openness. This is notably the case of SPOCs (small private online courses). But, several other variations have been identified.

These courses have the potential to educate a number of learners who have not had the opportunity to get a degree in the conventional university system (Ishansa, 2014). The emergence of innovation in MOOCs reflects therefore the convergence of interests of developing social, economic and technological progress in education in a global context. The potential exists for open education to play an important role in access education and to address issues and challenges of an ever changing environment that needs new forms of access and offer. The path to a open education opens up opportunities for sharing ideas, collaboration between institutions, teachers and learners, both locally and internationally at the same time that turns more significant the involvement in the teaching learning process (Yuan & Powell, 2013).

But are MOOCs really open? In a certain way, yes. In reality, and if comparing with the type of opening of OERs and OCWs, the degree of openness of MOOCs is limited (Havemann & Athens, 2014). Usually, the platforms that deliver the MOOCs refer to themselves as repositories, leaving the question of open licenses for universities. However, it is difficult to add this type of licenses when the platform is not designed for this (Martinez, 2014).

The use of the term open in MOOCs brings us to the discussion about the different meanings of the term that has marked the educational field (Peter & Deinmann, 2013). Anderson (2013) explains the meaning of open in MOOCs: allow external access of learners; a sense of ideological and political nature which refers to the academic freedom and free speech; without restrictions in the review, re-use, sale and improvement of learning content; no pre-requisites of knowledge or demographic for enrolment; freedom to initiate and determine their own rhythm and an economic sense, no charge. From the perspective of this author most MOOCs are open in the sense that they allow the participation from anywhere, at anyone and are free.

In relation to other aspects, the MOOCs can or cannot be opened. Schuwer, Janssen and van Valkenburg (2013), use a model to evaluate how open is education in MOOC. In this model the education consists of three elements: learning resources, learning services (tutoring, communities, evaluation, certification) and teaching (presentation, explanation, communication).

For the resources, the degree of openness is determined by the findability, the accessibility, the interoperability, the re-usability. In the case of services and education, the degree of openness is determined by the free availability (online), accessibility and the cost to the learner. If at least one of these elements have a certain level of openness, we can talk about open education. In this perspective, MOOCs are actually a type of open education since the resources and the learning services are

freely available. In a cMOOC, resources are also available for modification and in a xMOOC, education is not available online for free, with few exceptions.

The cMOOCs are deeply immersed in a speech of open education and participation is a locus in the construction of knowledge (Rodriguez, 2013). In cMOOCs, students play a more active role in their learning through the construction, sharing, distribution and review of artifacts resulting from the learning experience. In order to achieve the scability, the interaction student/teacher is replaced by the interaction student/student (Anderson, 2013). The resources are available free of charge on the web and they can be supplemented with materials and presentations provided by instructors/tutors/experts, as well as by the learners themselves. They are open and invitational. All who wish to participate can do so and in accordance with their interests they may negotiate the extent and nature of their participation. Thus, it is permissible to be immersed in a community of practice at the pace that is most comfortable. It is also characterized by the opening of membership criteria. In xMOOCs the concept of open is more restricted. The teaching methods are based on a behaviourist pedagogy, based on the transmission of information, tasks corrected automatically and evaluation among peers (Rodriguez, 2013). In order to achieve the scalibility it favors the interaction student/content (Anderson, 2013).

The advent of MOOCs forced an overview journey of the OER movement in what concerns their guidelines in the scenario of modern education. In fact, OERs are an important part of MOOCs but do not define them (Ishansa, 2014). According to Havemann and Athens (2014), the process of opening up MOOC's resources do not only add value to the resources in achieving a wider community, but also, it would be a promotion of the authors and institutions that offer the MOOC. But perhaps the aspect more important for institutions of higher education would be the possibility to demonstrate its commitment to openness and a better access to education for all.

6.3. Innovating pedagogy - The new pedagogical focus on collaboration and sharing

The adoption of an approach based on open educational practices (OEPs) unlocks a range of opportunities for the incorporation of social learning in the learning environment. The learners can create, use or modify the open educational resources (OERs) which can then be shared with peers or with instructors/tutors. The social interaction in a MOOC also shifts the focus of the transfer of knowledge to the social practices that involve discussion and reflection of their own experiences among pairs, creating content together and validation through the interaction between peers and between learners and teachers/trainers/tutors (Ehlers & Conole, 2010).

One could say that MOOCs are an evolution of the educational ideals promoted by the Open Learning Movement. However, we find critical voices such as Athens (2015) who point out that from the perspective of the OERs philosophy, the vast majority of MOOC courses available present a major problem which is their resources are not accessible, modifiable and translatable. This impedes democratization and free access to

knowledge. In fact, MOOCs can provide a great opportunity to develop new pedagogical models, since these types of courses can be a point of creation and use of OERs by offering contents and quality resources (Sangrà & Wheeler, 2013). However, openness in MOOCs is mainly restrained to openness in registration for participation rather than content, since access to resources is restricted to participants who have registered in the course. In addition, -mostly that content doesn't allow adaptation and translation, so their materials cannot really be reused (Athens, 2015). In order to democratize access to the resources of the MOOCs, they must be accessible, modifiable, adaptable and translatable. This is why Athens (2015, p. 10) proposes three ways to open the contents of the MOOC courses:

1. ***To open up MOOC contents as OERs***. This involves releasing the materials as individual objects in OER repositories, so that the course materials (photographs, videos, exercises and evaluations) can be deposited in these repositories under Creative Commons licences. As such, the attribution of copyright is syndicated both to the individual authors of the resources and to the university in which the MOOC originated, thus allowing for the re-use of resources individually by not only those who have participated in the course, but also by teachers, researchers and learners who are interested in the subject.

2. ***To open contents by packing data by content units***. Text, images, videos, exercises and evaluations that make up each unit or week within a course can be converted into downloadable data packets hosted in OER repositories under Creative Commons licenses. Thus, those who are interested in accessing the materials can download the resources in contextualized packages or learning units that have a structure, a program and a final evaluation. As for copyright, in this case as in the previous one, each package should be attributed to the authors of the unit and materials and to the university that hosted the course.

3. ***To transform the MOOC into Open CourseWare courses***. Once the MOOCs are completed, these can become untutored open courses available on OCW platforms with Creative Commons licenses, which anyone could access and download the materials and evaluation exercises. This type of course would not require access registration and materials could be reused by its users. One of the advantages of this model is that the data of use and download of the contents can be analyzed and that it is not necessary to transfer the resources to repositories. This way the effort on the part of the team of authors would be minimum, and would only consist In cleaning the personal data of the registered participants in the course.

On the other hand, Valverde (2014) suggests that for learning in a MOOC to be effective, it is necessary for students to have the capacity to self-regulate their own learning process. Moreover, they should also have a set of digital competences which

give them enough confidence to properly manage their participation in these open learning environments as well as positive expectations regarding the accomplishment of the tasks. As stated by this author (2014, p. 107):

> "The demands of participation in this type of training are very high which means a "natural" selection of students who oppose certain messages presented by MOOCs as a "democratization" of higher education. High dropout rates partially corroborate this perception"

Beyond the discussion about how open MOOCs really are and about the democratization of knowledge, it must be acknowledged that the use of OERs in this type of courses promotes the mobilization of digital competences liked with the whole human development of the students. As they additionally require the mobilisation of instrumental and research skills. In order to achieve effective learning it is necessary for the students to develop the capacities needed in open learning: the ability to diagnose one's own needs, to plan plans to achieve one's own goals, and to evaluate the effectiveness of learning activities (Salinas, 1997).

6.4. Some institutional best practices

OpenupEd (http://www.openuped.eu/) is an initiative of the European Commission (2013) to innovate the teaching-learning process through ICT and to modernise education covering the full spectrum of learners in all sectors of education through the OERs and MOOCs. This is the first and only MOOC initiative pan-European. It was launched in 2013 by the European Association of Distance Teaching Universities (EADTU) with eleven initial partners from eight European countries and three countries outside the European Union. It is an open partnership and a non profit organization that provides MOOCs which contribute to the open up of education. Contains a decentralised model where the institutions are leaders and make their own decisions. Despite the diversity of institutional approaches, there are eight aspects in common with these MOOCs: openness to learners, digital opening, an approach centered on the learner, independent learning, interaction, supported by the media, options for recognition, focus on quality and spectrum of diversity.

Initially OpenupEd offered 40 courses in different areas. Currently it offers 200 MOOCs in 13 different languages, including Arabic. Since the beginning the courses are offered on the platforms of each institution as well as in the mother tongue. The courses can be attended in a given time period or at any time and at the pace of the learner. All courses should lead to the recognition by: a certificate of completion, badges or a certificate with credits after formal examination (paid). For open up education there are two conditions that must be met: remove all barriers and offer appropriate incentives for students to make progress and succeed. Mulder and Jansen (2015) identify and describe briefly a series of barriers that MOOCs may remove as well as a set of incentives that MOOCs can offer at the same time that indicates how the

OpenupEd is performing. In spite of showing that it is on the right track there is still a lot of work ahead.

In 2013 Universidade Aberta (UAb), taking in account its large experience in the field of distance learning and eLearning developed a specific pedagogical model for MOOCs, the iMOOC model (Teixeira & Mota, 2013). This fully virtual model was the first institutional pedagogical model for MOOCs worldwide and applies the main pedagogical principles of the institutional virtual eLearning pedagogical model, built upon four main pillars: learner-centredness, flexibility, interaction and digital inclusion (Pereira *et al*, 2008). The iMOOC pedagogical approach incorporates also relevant aspects of UAb practice in the field of online learning, such as individual responsibility, interpersonal relationships and innovation. The MOOCs offered according this model are open to all who wish to participate. The contents are open access and the resources available are all OERs or free available on the Internet without legal constraints.

The iMOOC model supported the design of the pilot course *Climate change: the context of life experiences* offered by UAb in the summer of 2013 in which they signed up more than one thousand participants (Coelho *et al*, 2015). According to the model, the resources provided are just a starting point for the realization of the activities. Typically, they are licensed as OERs or freely available on the Internet. Content produced by participants is licensed according to the individual preference of the authors.

Following the same pedagogical model UAb developed two other courses: *Digital Skills/Competences for Teachers* and *Lisbon and the Sea.* The first one had five interactions (March 2015/December 2016) and more than one thousand five hundred participants and took place under the ECO project. *Lisbon and the Sea* was offered three times (April 2015/July 2016) and was one of the MOOCs that EMMA project provided on its platform. Within this project took place also four interactions of the *Climate change: the context of life experiences.*

In the case of Universidad Carlos III de Madrid **(**UC3M), the fundamental guidelines of open education are part of its philosophy: share, reduce barriers and promote access to education. The university joined the movement OCW in 2006. In 2007, launched the initiative E-Archivo created with the following objectives: collect, store and preserve intellectual output resulting from activities academic and research of the academic community in digital format and provide open access to these documents. Also in 2007, a group of law professors initiated a series of courses OCW with characteristics that are very specific due to its orientation, design and theme. These courses were fully opened offering online access and open to all resources. In 2012, were formed two working groups (MaREA and UTEID - Unit for Educational Technology and Innovative Teaching) with the objective of establishing and coordinating the bases for the creation, use, dissemination and preservation of future OERs and support instructors in this process (Malo de Molina, 2013 cit in Fernández & Webster, 2014).

During the academic year 2012-2013, the same group of teachers decided to convert one of the OCW courses in a MOOC format. This MOOC was available on the platform Miriada X, a model xMOOC, with the title *Public Procurement, Public Personnel Administration and Public Property Law*. More than 2000 students enrolled in the course, the majority of Spain but also from countries of Latin America and 200 students have successfully completed the course.

The OCW course had some specific characteristics. In addition to the audiovisual material, it was based on a significant quantity of texts (originally from the OCW course) that contributed to a more thorough and solid approach to theme. On the other hand, contained a volume of considerable work in which the student followed an intense program with complex assignments and assessment tasks. As a result, a large number of students dropped out during the first week but those who continued reached the end with a solid education similar to the students enrolled in the "Bachelor's Law degree". In 2014, joined the EdX to launch four MOOCs (Fernández & Webster, 2014). Currently it offers fourteen MOOCs (https://miriadax.net/web/universidad-carlos-iii-de-madrid).

SECTION 7. CONCLUSIONS

Independently of the learning design approach used, resources provided in MOOCs play a major role in the learning experience. Typically, learning resources used in these courses are of diverse nature and format. They can be videos, texts, games, etc. Nevertheless, although MOOCs can be defined as an ultimate evolution of the open education movement, most of these type of courses on offer today do not use or generate open educational resources.

This results from three main reasons. Firstly, the majority of MOOCs only provide openness to registration for participation but not to creation or use of content. Secondly, content doesn't allow in most cases adaptation and translation, making it quite difficult to reuse them. This phenomena relates to the policies being implemented by providers, being them institutions or the major platforms. In fact, the degree of openness of a resource is determined by its findability, accessibility, interoperability and re-usability and cost involved for the user.

In the case of an xMOOC approach, the resources account for most of the learning experience altogether. As such, the scientific quality of the resources is critical. Mostly they consist of video recordings of lectures combined with additional references. However, given the marketing value of these courses, institutions invest in producing high quality materials. As such, many tend not to release them as OERs, but instead as copyright materials.

In an cMOOC environment the main resource is the network of learners itself and is common that most of the resources available are submitted and shared by the

learners themselves. As for the mixed approaches (iMOOC, sMOOC and others), resources are usually produced and validated by the providing institution, but the learners are also invited to contribute and share their own. They are used as a starting point for the realization of the learning activities. In these approaches is more common to find providers release their materials as OERs, protected with a Creative Commons licence, reuse already available OERs or even use freely available materials on the Internet. Yet, the degree of openness of these resources might vary substantially.

Research suggests that the full potential of MOOCs in what regards its social impact is only assured if they allow for the development of new disruptive pedagogical models. This relates to the possibility of these types of courses operating as a basis for the disseminated creation and use of quality OERs. As such, MOOCs should also apply the «5Rs» principles, allowing users to retain, reuse, revise, remix and redistribute.

Naturally, this goal can be achieved either by promoting the exclusive use of OERs in the MOOC design process as by implementing processes of open reuse of MOOCs after initial iteration. Three possible alternative procedures can be followed: to open up MOOC contents as OERs; to open contents by packing data by content units and to transform the MOOC itself into Open CourseWare courses.

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