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OER: A European policy perspective

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Abstract: The potential benefits of OER have led many European governments to implement policies supporting their creation and use. This chapter aims to put these OER policies in context, discussing their focus and scope and highlighting challenges and bottlenecks. On the basis of the analysis of the current state of the art, it is argued that one of main barriers to reaping the benefits of OER is fragmentation combined with a lack of clear and uniform legal frameworks. The recent European "Opening up Education" initiative is presented as a way to overcome these barriers by creating synergies and joining efforts across Europe.

Keywords: Open Education, OER, Policy, Europe

Introduction

Education and training are changing radically all over the world. The increasing demand for education in emerging economies, however, contrasts with the financial cuts being implemented in Europe. At the same time, global competition between education providers for funding and talent is intensifying. Probably, the most disruptive pressure comes from Information and Communication Technologies (ICT) which could be potential catalysts in the (near) future of education and training (Redecker et al., 2011). The question is whether the European players (institutions, governments and citizens) in education and training systems are ready to seize the opportunities offered by the digital revolution and overcome the challenges of the 21st century.

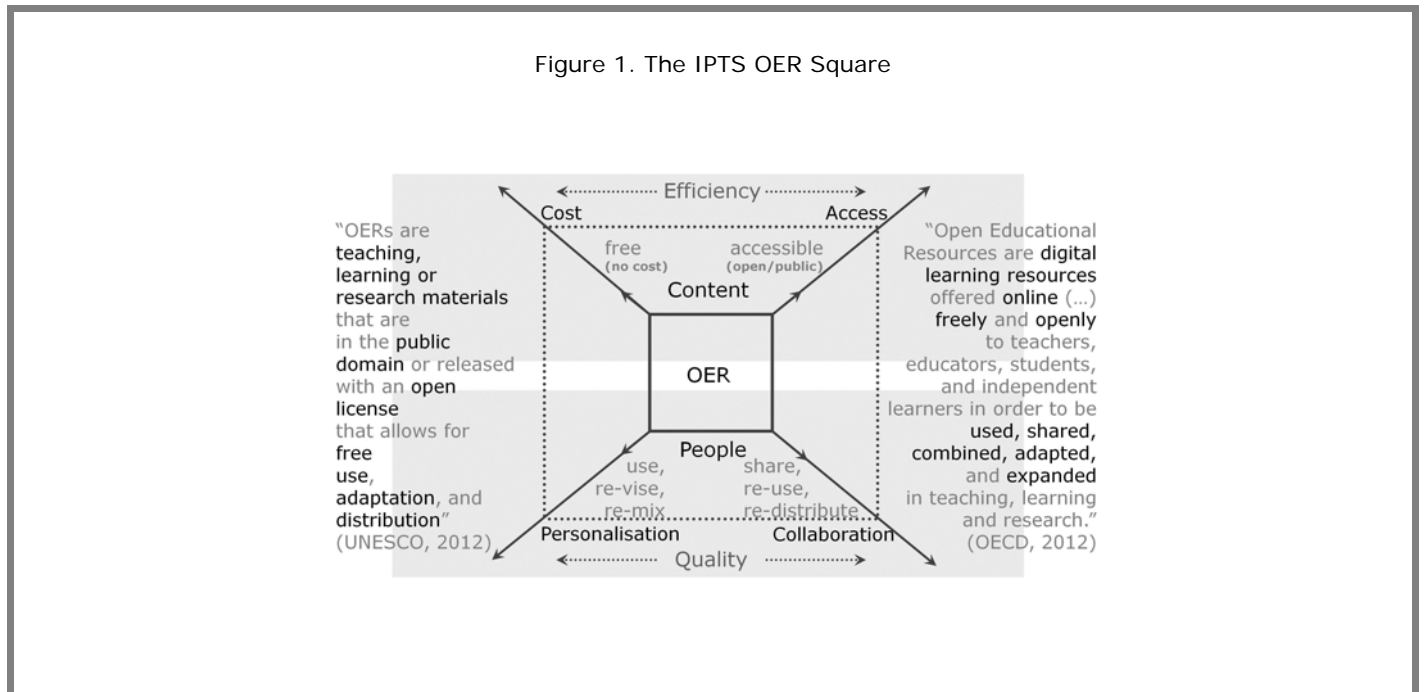
The Europe 2020 strategy [1] acknowledges that a fundamental transformation of education and training is needed to address the skills and competences required for Europe to remain competitive, overcome the current economic crisis and grasp new opportunities. The Europe 2020 strategy flagship initiatives underline the need for innovation in education and training. The European Commission has also established key educational targets for promoting creativity and innovation, reducing early school leaving, increasing participation in higher education and adult learning, fostering re-skilling and up-skilling, and modernising education and training.

Educational stakeholders recognise the contribution ICT could make to achieve these targets. All European countries have implemented policies and activities which aim to promote the use of ICT in education and training. The Thematic Working Group on ICT and Education is reporting on these initiatives and sharing good practices. This group is made up of representatives of the Member States under the Open Method of Coordination on Education and Training 2010 (Van den Brande, Carlberg, & Good, 2010).

Responding to these policy trends, the "Rethinking Education" Communication (European Commission, 2012) launched by the European Commission in November 2012, emphasizes the need to stimulate open and flexible learning in order to provide the skills needed in the 21st century economy and labour market. It points out that the quality of education relies on a mix of different educational approaches and materials. Therefore, the Communication calls for wider access to and use of Open Educational Resources (OER), accompanied by clear quality standards and mechanisms to assess and validate the skills and competences acquired.

OER, as defined by UNESCO in 2002 are "teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution". According to this definition, OER do not exclusively refer to digital resources, although the concept is usually restricted to ICT materials, as illustrated by the OECD definition (Hylén, Van Damme, Mulder, & D'Antoni, 2012).

Reflecting on these two commonly-used definitions of OER, at least four different characteristic dimensions can be distinguished, as illustrated in Figure 1. OER are (digital) learning and teaching (and research) resources that are (1) free (as in "gratis"); (2) open (i.e. freely accessible, publicly licensed, in the public domain); (3) they can be shared and re-distributed; and (4) they can be freely (or liberally) re-used, adapted and mixed for individual learners' and teachers' purposes. The first two dimensions concern the content sphere of OER. The latter two dimensions, also referred to as the 4Rs of Open Content[2] (i.e. the right to reuse, revise, remix and redistribute content), point to the use of content through personalisation and collaboration. This is what we call the "people" side of OER. It is important to bear in mind, however, that not all educational materials commonly considered as OER actually satisfy all four conditions.



The importance of OER for innovating learning and teaching lies in the interconnectedness of these four dimensions and the fruitful interplay of free use and collaborative revision as a mechanism to improve quality and usability. As a consequence, the 2012 Paris OER Declaration by UNESCO encourages public institutions to: "Promote and use OER to widen access to education at all levels, both formal and non-formal, in a perspective of lifelong learning, thus contributing to social inclusion, gender equity and special needs education" (UNESCO, 2012a). Disaggregating the UNESCO recommendation, we can state that OER provide a strategic opportunity for the governments to:

- Foster inclusion and democratization of knowledge by extending access to education (Atkins, Brown, & Hammond, 2007; Lane, 2008);
- Increase the efficacy (quality) and efficiency (cost-quality) of educational systems, by promoting innovations that OER allow, and using their potential to reduce educational costs.

Furthermore the promotion of OER can facilitate policy dialogue, knowledge sharing and collaboration between states and institutions at the pan-European level. This is one of the reasons why the European Commission decided to take action and launch a dedicated initiative for "Opening up Education" in Europe.

This chapter aims to describe the landscape and the trends in OER policies and initiatives in Europe. It highlights the main challenges that OER policies have to overcome and, finally, presents and discusses the European "Opening up Education" initiative.

Current trends

There are distinctive differences in the use and promotion of OER between school education and higher education. There is also a notable lack of awareness of how to seize the opportunities offered by OER to promote lifelong learning. Higher education is currently the most advanced sector in the deployment of OER as shown by the boom of Massive Open online Courses (MOOCs). However, Europe (with some exceptions, such as the UK) is not embracing OER with as much enthusiasm as other regions of the world, like USA or Brazil.

In both these countries, public authorities are strongly committed and there is collaboration between stakeholders. In the US, OER and digital technologies are key elements of the Obama administration's National Education Technology Plan [3] and its goal to ensure the United States has "the best-educated, best-prepared workforce in the world by 2020". A number of systemic initiatives, designed with a view to scale from the outset, have been implemented. They are based on a model of

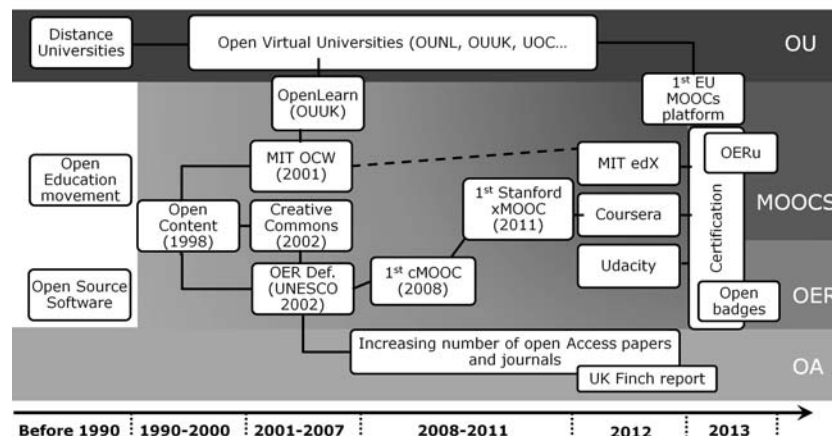
bottom-up/top-down innovation, in which all relevant stakeholders constitute an eco-system at the local/state level. All initiatives are accompanied by rigorous evaluation and controlled experiments so that an evidence base about what works can be built up (Shapiro, 2013). In Brazil, OER are seen as an opportunity to democratise access to education and their development goes hand in hand with the political objective to reduce the digital divide by extending the availability and use of the Internet. One of the success factors in Brazil's national initiatives is the close cooperation between universities, the Ministry of Education, local authorities and schools.

In Europe, the expected benefits of OER have led most European governments to implement policies to encourage their creation and use (Hylén et al., 2012), especially in (upper) secondary education. Fewer policies of this kind have been directed at higher education due to the institutional autonomy of universities (Hoosen, 2012), and even fewer at the supposedly strongest impact area of OER, lifelong learning. In the past, the policy focus has been on expanding the development of and access to OER. However, there has been a growing awareness that this must be accompanied by a shift in pedagogical practices towards "Open Educational Practices" (OEP). Only thus can their potential to promote quality and innovation in teaching and learning and to address individual learners' needs be realised. [4] The European Commission (2013) Communication on "Opening up Education" therefore follows a more comprehensive approach in which dedicated OER incentives are embedded in a broader strategy fostering the use of ICT for learning.

Higher Education

Higher education institutions, particularly in the USA, have been at the forefront of OER development and deployment since 2001, when the Massachusetts Institute of Technology (MIT) announced that nearly all its courses would be freely accessible to anyone on the Internet. In 2002, as the number of institutions offering free or open courseware (OCW) increased, UNESCO organized the 1st Global OER Forum and the term "OER" was adopted. Subsequently many universities worldwide started to offer open access to their courseware (Vlădoiu, 2011).

Figure 2. The Brief History of OER in Higher Education



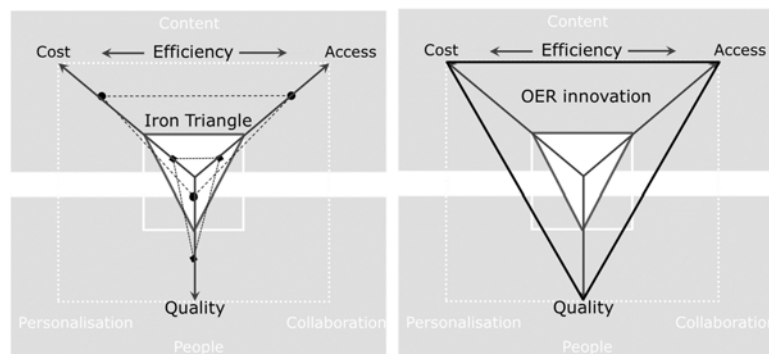
UNESCO and the Commonwealth of Learning have developed guidelines for integrating OER into higher education to encourage a systematic production, adaptation and use of OER (COL & UNESCO, 2011). In Europe, initiatives such as SCORE[5] or OPAL, [6] amongst others, have provided support and advice to individuals, projects, institutions and programmes, helping them to create, publish, re-mix, re-use and redistribute OER. These are examples of what we may consider the "top-down" approach to developing OER: initiatives funded by international organisations, educational funding bodies, public institutions or foundations.

The emergence and spread of massive open online courses (MOOCs) has brought the OER movement to a new high. MOOCs are, according to the definition provided by Wikipedia in January 2012, "a type of online course aimed at large-scale participation via the web". In 2013 the biggest MOOC platform was Coursera, initiated at Stanford University as a venture capital start-up in April 2012. It was followed by edX, a Harvard/MIT non-profit initiative launched in autumn 2012 with a start capital of \$30m (see Vale and Littlejohn, this volume). Coursera is growing exponentially: by August 2013, it already had 85 partner universities worldwide; 431 courses and 4.5 million users. EdX currently has 28 partner universities - several of them from Asia and five from Europe (TU Delft, EPF Lausanne, TU München, Karolinska Institutet and The Université Catholique de Louvain) - offering 63 courses to more than one million students on its platform. In April 2013, the European Association of Distance Teaching Universities (EADTU) joined this global movement and launched the first pan-European

MOOC platform [7] that offers 40 courses in 12 different languages.[8]

While MOOCs are not strictly OER (the resources provided rarely encourage adaptation or re-mix and are not always published under an open license), they epitomize an unprecedented move towards greater accessibility of Higher Education at no (or low) additional cost based on high quality theoretical content. Sir John Daniel and others therefore argue that OER in general and MOOCs in particular can break the "Iron Triangle" that has dominated past debates on higher education. The Iron Triangle refers to "the assumption that that quality, exclusivity, and expense necessarily go together".[9] Hence, it is impossible to widen access, lower cost and increase quality at the same time: any improvement along one of these axes will always be detrimental to at least one of the other axes. It is now believed that OER will not only make high quality higher education available at low cost to a large number of users, but it will also lead to innovation within universities.[10]

Figure 3. The Iron Triangle and OER Innovation



Developed on the basis of the Iron Triangle by Sir John Daniel (http://www.col.org/SiteCollectionDocuments/Daniel_110308AustraliaHE.pdf) and Fred Mulders argument for OER innovation in Higher Education (<http://ministerialconference2012.linkevent.no/F%20Mulder%20parallel.pdf>)

However, it is still unclear how this leap can be accomplished in practical terms. Universities and enterprises involved in MOOCs have not yet consolidated their business models. Coursera, for example, is currently experimenting with different funding lines, including the revenues paid by an Amazon.com affiliates program if users buy books suggested by professors; an opt-in recruiting program that matches students with employers, and verified course certificates offered for a fee. Thus, it remains to be seen how "open" and "free" MOOCs will be in the future.

It is, however, clear that the MOOC movement is starting to undermine the traditional bricks-and-mortar university model (cf. Barber et al., 2013). Higher education institutions will have to seriously consider what kind of services they can offer their students and whether these will be better or complementary to an online Ivy-League MOOC. Most European universities and academics have not yet realised the extent to which their conventional approach to teaching and research is being challenged by open learning. According to a survey carried out by the European University Association (EUA) in 2013, the concept of MOOC is unknown in one third of the 200 European universities consulted and only another third has discussed the topic internally.[11]

School Education

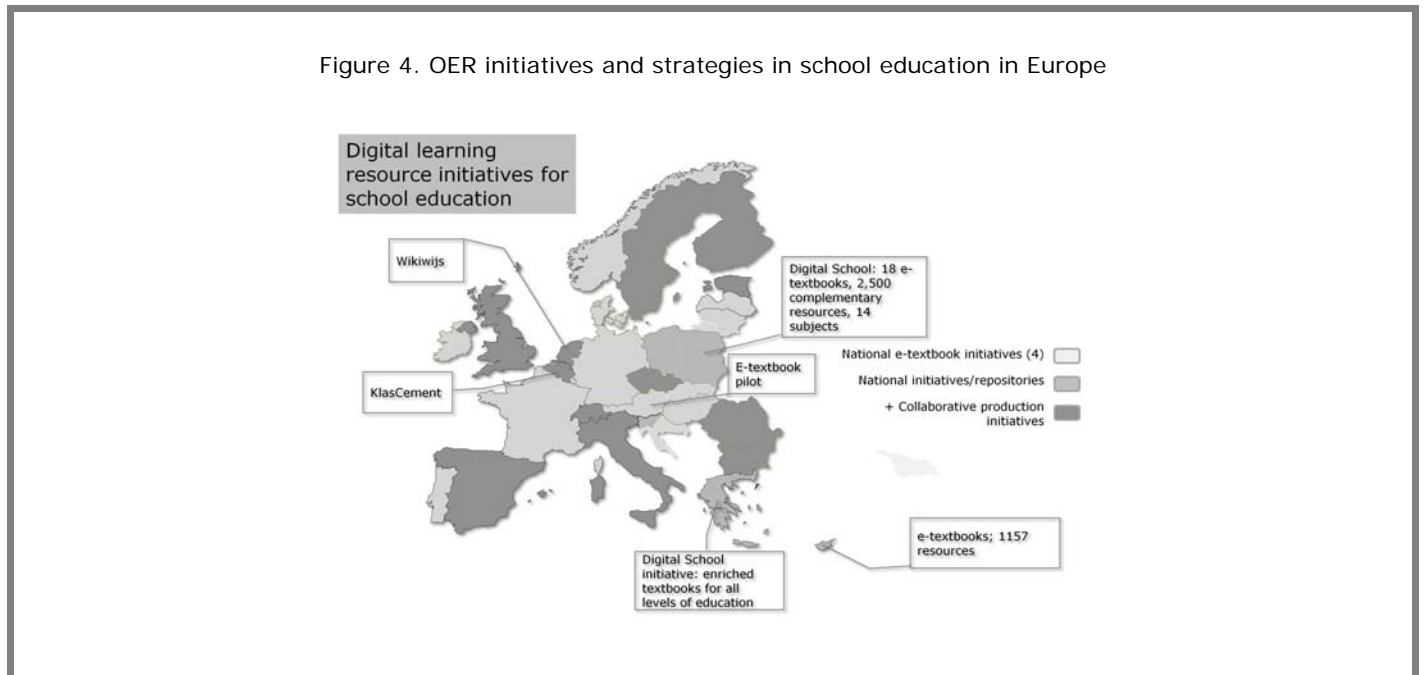
OER also have much to offer primary, secondary and vocational education and training institutions in creating, sharing and adapting learning material. Open learning object repositories, digital libraries and collaborative authoring platforms where learning resources can be exchanged and reused have been around since 1990s. Nowadays, all EU Member States have national gateways to digital learning resources for school education, and some also promote access to OER. In many European countries, these include public broadcasting corporations, cultural heritage funds and other national or public institutions. Most textbook publishers also make additional teaching and learning materials available for free online. Thus, there is a range of educational materials of different scope, focus and quality available to learners and teachers, sometimes scattered across the Internet, sometimes, as in Denmark[12], accessible via one central platform.

In some countries, a collaborative approach to producing and sharing OER is being followed. The Wikiwijs project in the Netherlands, for example, is inspired by the idea of wikis and focuses on the collaborative development of content. It offers

teachers from primary to university education an open platform where they can find, download, (further) develop and share educational resources. The whole project is based on open source software, open content and open standards. An important characteristic of Wikiwijs, perhaps the key to its success, is the collaboration with educational publishers, leading to a combination of OER with more traditional materials. According to some national surveys, teachers prefer to combine traditional textbooks with resources from the Internet. [13]

KlasCement in Flanders (Belgium) [14], on the other hand, is run by the non-profit organisation EduCentrum, mainly financed by the Ministry of Education of Flanders. KlasCement is a repository of teacher-generated learning materials (more than 26,000 resources), some of which are made available under open licences (variations of Creative Commons). In March 2011, it had 67,000 members, two thirds of whom are teachers. The portal has a very active community of contributors with around 8% of users sharing resources. Content and metadata submitted to KlasCement are moderated by a team of up to 10 teachers. Furthermore, all resources are put into moderation every two years to ensure relevance and quality.

Figure 4. OER initiatives and strategies in school education in Europe



Some European countries, for example Slovenia, Greece, Cyprus and Poland, are exploring free digitally-enriched e-textbooks as a means of saving money in times of crisis. In Poland in 2012, the Ministry of Education launched the "Digital School" initiative, in which at least 18 free textbook resources (including multimedia packages) will be published under a Creative Commons Attribution - Share Alike license. In Slovenia, the government is currently running an e-textbook pilot with four e-textbooks and is planning a further 25 new e-textbooks by the end of 2013. In total, 2 million Euros are being invested in this project. In Greece, the "Digital School" initiative by the Ministry of Education is part of the "New School" reform and is the main vehicle for exploiting the potential of ICT and OER. The scheme has been piloted in 800 primary and 1,250 lower secondary schools, with a view to providing a platform for digital content and tools and teacher training. One of the things offered by this initiative is an official repository of all available textbooks in the form of enriched e-books for all levels of education (primary, secondary, upper secondary and professional education). However, the initiative may not be fully implemented as it is currently being undermined by major budgetary cuts in Greece.

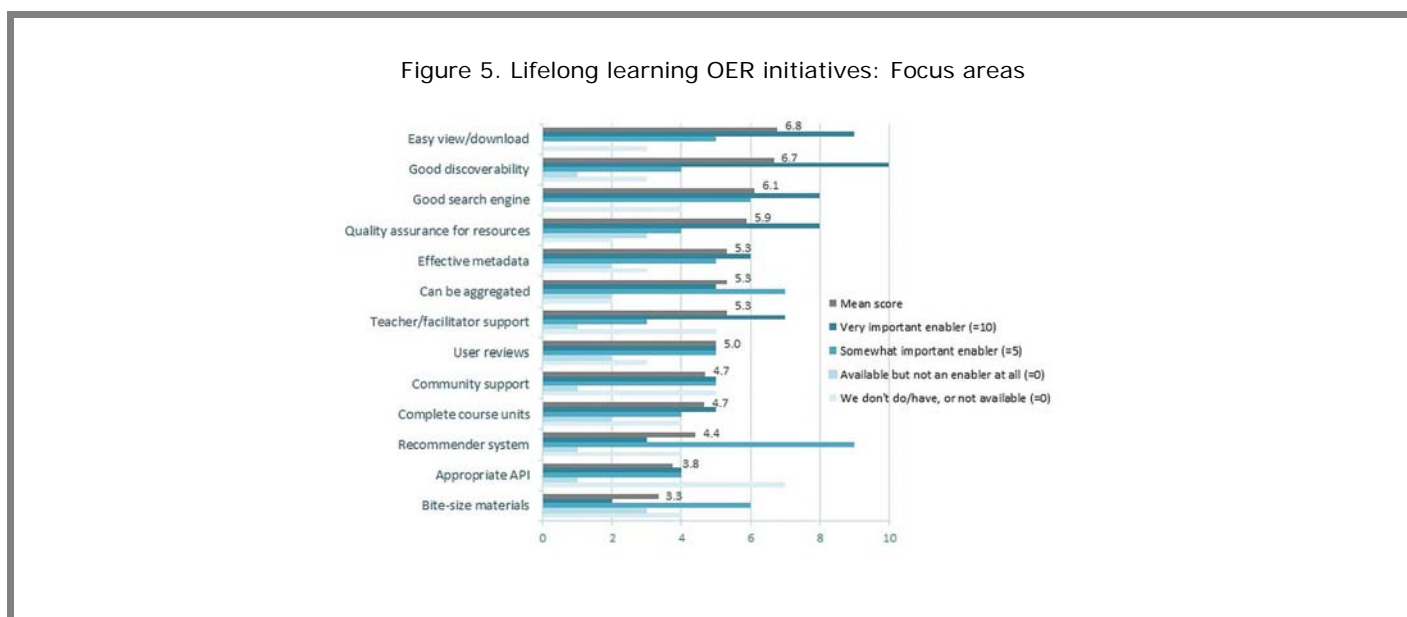
At the pan-European level, a number of European-funded initiatives have tried to encourage the reuse of OER, both at national and cross-border levels. LeMill [15], for instance, already had over 7,500 members and over 8,500 reusable learning resources by 2009 (Leinonen et al., 2010). Another example is the Learning Resource Exchange (LRE) by European Schoolnet which provides a service that enables schools to find educational content from many different countries. The Scientix [16] platform contains teaching material on science education and also aims to enable teachers' communities to share knowledge and experiences. Open Discovery Space [17] provides a socially-powered and multilingual open learning infrastructure to boost the adoption of eLearning resources in Europe. The SLOOP2Desc (2009-2011) initiative [18] promoted the use of OER among teachers in Vocational Education and Training (VET).

However, despite the large number of OER available for schools and the high number of national and pan-European initiatives, OER are not yet widely used in school education and less so across national borders. The overall picture of OER use in school education in Europe is mixed: there are different levels of deployment and different approaches towards making use of OER that usually depend on the national and local educational policy context. Two poles emerge when comparing different national approaches: on the one hand, there is a focus on the collaborative dimension of OER, and on the other, there is the use of centrally-commissioned interactive digital textbooks as a means of reducing public and private spending on textbooks.

Adult Education and Lifelong Learning

Surprisingly, OER have not (yet) been exploited to support lifelong learning or adult education by making learning opportunities available openly and freely to a general audience (Minguillón, Rodríguez, & Conesa, 2010). Case studies with good examples and successful initiatives suggest that the development of innovative forms of teaching and learning is crucial for the success of OER (Dinevski, 2008). Furthermore, heterogeneous interfaces, search-engines and varying criteria hamper access to and retrieval of relevant resources that could assist enterprises in addressing the training needs of their employees (Niemann et al., 2010).

In a study conducted by the Glasgow Caledonian University on behalf of IPTS, over 100 relevant lifelong learning and adult education initiatives were analysed to better understand the current use of OER (Falconer et al, 2013a). A detailed survey conducted with initiative organisers reveals that those offering OER know very little about who is actually using these resources. Even for lifelong learning, pedagogic approaches envisaged by OER initiatives are rather traditional, institutional and teacher-directed, which contrasts with current trends towards informal and self-directed learning. Furthermore, the concept of OER is novel and still somewhat confusing to lifelong learning stakeholders. For example, the distinction between free (meaning "no cost") and openly licensed is not well understood. It is therefore difficult for them to understand the potential of OER and reap their benefits.



The ability of employers, and the wider public, to recognise the value of learning through OER also requires, at least in the longer term, trusted forms of assessment, certification and accreditation. At present, the degree is still the gold standard of post-compulsory education, although it is not an appropriate format for most lifelong learning activities. Thus, the [European Council \(2012\)](#) Recommendation on the validation of non-formal and informal learning and the UNESCO (2012) Paris Declaration both call for the recognition and accreditation of competences acquired through OER, for example by means of small units of credit, competency-based credits, peer reviews, and wide availability of competency-based testing. Recognition is important for getting a better match between workers' skills and available job positions and it also has positive implications for equity, e.g. providing second chances for drop-outs, improving access to formal education and training; increasing self-confidence (Werquin, 2010)[19]. Official recognition and quality schemes could increase the credibility of OER at little cost, raising awareness and increasing uptake. Innovative tests and assessment formats can further increase the usefulness of OER for lifelong learners.

Policy challenges

Although OER are high on the policy agenda and supported by many education and training stakeholders, their use at schools, universities and adult education institutions has not reached a critical threshold. Some of the bottlenecks and barriers to mainstreaming the use of OER in education and training are elaborated below.

Content aspect: Foster adequate, easy to find and high quality resources

Traditionally, national and regional policies have focused on the production of educational contents and the creation of repositories to facilitate access. Thanks to these supply policies, there are a number of educational resources and OER platforms on the Internet. The demand, however, is still lacking due to the following factors:

- **Discoverability** : It is not easy for users to find quality resources that are appropriate to their teaching and learning needs (e.g. match of curriculum subjects across European countries remains a challenge).

- **Lack of quality assurance mechanisms** : the sheer number and nature of OER make it difficult to employ quality assurance mechanisms across various repositories. Some European initiatives have addressed this issue by defining specific quality mechanisms for OER (e.g. OPAL or OERtest[20]), highlighting the needs of a specific context of use and communities of users (i.e. an independent learner in a lifelong learning context may have different quality assurance needs from learners in an institutional context). In practice, quality assurance is the responsibility of each institution, teacher or learner who uses OER (Kanwar & Uvalic-Trumbi, 2011).
- **Language** : nearly half the OER initiatives surveyed in the international Poerup project supplied their resources in English. As a consequence, learners who do not speak English have less choice, and there is the danger that the content developed will not reflect local contexts and lose cultural richness.
- **Lack of adoption of open standards** : Despite the efforts to develop open technical specifications for learning applications, the lack of adoption of agreed standards can hinder access to OER. For example, the case of e-books shows that the business models of some major IT companies also represent a major obstacle to interoperability of contents. For e-books, fully interoperable and compatible technical standards exist (e.g. EPUB-3), but enterprises like Apple or Amazon prefer to maintain closed ecosystems to defend their market shares (Bläsi & Rothlauf, 2013).

Legal aspect: Clarify the legal framework

An important challenge to extending the use of OER in European education is to implement a legal framework that clarifies the use, sharing and re-use of educational materials available on the Internet. In the past, national copyright laws provided different types of exceptions for educational use of copyrighted material. In addition, there is the issue of cross-border use of publicly-funded educational material which is free to use in one country but cannot be made publicly available to users in another country. Understandably, teachers and learners perceive copyright rules as too complex and not transparent, and thus choose not to use or re-use Internet resources (Clements & Pawlowski, 2012).

On the other hand, moves for example in the UK, to make all research, learning, and teaching materials produced with public funds publicly and freely available (Finch, 2012), have been greeted with harsh criticism by publishers, who perceive these changes as a threat to their traditional business models. In this context, the key question is how OER, commercial learning material and other types of learning materials will co-exist.

Societal aspect: Foster learners' and teachers' skills for using OER

The use of OER is also hindered by access constraints and lack of skills. Five main issues arise:

- **Uneven availability of ICT infrastructure** : In June 2012, Internet penetration in Europe was 73% overall, but this figure includes variations between countries, for example 44% in Romania and 93% in the Netherlands.[21]
- **Different levels of digital skills** : According to Eurostat[22] in 2011, the proportion of the population with a high level of ICT skills varied between 43% (Finland and Luxembourg) and 10% (Romania). While 53% of the European labour force as a whole felt confident in their computer and/or ICT skills to look for or change jobs, this figure drops to below 30% in several countries such as Cyprus, Romania, Greece and Italy. Furthermore, the level of digital competence varies substantially according to age, education level and gender.
- **Teachers' digital pedagogic skills** : Teachers need to be trained to exploit the potential of ICT and OER for improving teaching and learning experiences. Currently, according to a joint EC-OECD study in 2010, 58% of teachers surveyed said they had not received any training on how to use ICT in the classroom. Around 70% of teachers in the EU, however, would like to have professional development in ICT skills (Scheerens, 2010).
- **Developing innovative teaching practices and innovation-friendly teaching environments**: Teachers usually perceive OER as resources that do not fit with teaching approaches (Carneiro, Nozes, Policarpo, & Correia, 2011; Harley, 2008). OER are often adapted to traditional practices and therefore their potential to improve the quality of the learning process is not exploited. Furthermore, European education and training institutions often lack the vision or capacity to promote innovative teaching methods and an integrated use of technologies. Additionally, curricula and assessment schemes are often too restrictive to allow teachers to employ and experiment with innovative and creative pedagogies, especially in primary and secondary education (Petrides, Nguyen, Jimes, & Karaglani, 2008; Sahlberg, 2006; UNESCO, 2012b). The fact that many teachers feel alone in their efforts is reflected by 74% of respondents to an IPTS survey saying they needed more institutional support (Cachia, Ferrari, Ala-Mutka, & Punie 2010).
- **Insufficient individual learning-to-learn skills**: OER have an enormous potential for lifelong learning, but this requires learners to be able to identify and monitor their own learning needs and to know how to fulfil these (Falconer, Littlejohn, & McGill, 2013b).

Economic aspect: Foster sustainability and increase returns on public investment on OER

In the next few decades, the level of worldwide demand for university studies will largely exceed the capacity of existing systems. It is predicted that the demand for higher education will rise from 97 million students in 2000 to over 262 million students by 2025. The magnitude of unsatisfied demand indicates that alternative learning and teaching concepts need to be developed. OER can contribute by complementing existing post-secondary education provision, creating flexible pathways for learners (Athabasca University et al., 2011). As in other economic sectors, it is expected that digital technologies combined with new didactics will enhance resource-productivity and economies of scale, expanding access to more people at lower

costs (Butler Battaglini et al., 2012; SRI 2012).

In Europe, against the background of the economic crisis starting in 2008, one of the main arguments for OER is their potential to reduce costs of education and training. One study indicates that correct use of open textbooks could save over 50% of textbook costs without affecting educational outcomes (Wiley, Levi Hilton, Ellington, & Hall 2012). This could represent a partial solution[23] though it should not be forgotten that the cost of educational materials (both paper-based and digital) amounts to less than 10% of the overall costs of education.

Despite the potential of OER for reducing the costs of education, there are important debates on the sustainability of OER initiatives (cf. Downes, 2007; Meiszner, 2012). The current reliance on government and institutional funding, in particular, is a cause for concern, as it discourages the development of alternative revenue streams such as paid-for services, cross-sector partnerships, advertising or membership. Governments and institutions appear to lack confidence in OER as a viable long-term investment, e.g. as a cheaper alternative to commercial text books. From a public policy perspective, it is important to understand how to integrate public and non-public funding models in order to reduce education cost and maximize public investment returns.

The European "Opening up Education" initiative

The European Commission has a long tradition of support to the integration of ICT into education and training. Since the main responsibility for designing, developing and implementing policies in education and training systems is a prerogative of its Member States, European policy has focused on:

- **Financing national initiatives and projects**, e.g. through the eLearning (2004-2006) and Life Long Learning (2007-2013) programmes, the Framework Programmes 5 (1998-2002), 6 (2002 - 2006) and 7 (2006-2013), and eContentPlus (2005-2008);
- Encouraging the **exchange of experiences and benchmarking between Member States**, through the Open Method of Coordination (OMC) and, more concretely, in the Thematic Working Group on ICT and Education.

In September 2013, the European Commission launched its new initiative "Opening up Education: Innovative teaching and learning for all through new technologies and Open Educational Resources" (European Commission, 2013). This Communication "sets out a European agenda for stimulating high-quality, innovative ways of learning and teaching through new technologies and digital content" (ibid). It is based on the belief that embedding ICT and OER in education will increase both efficiency and fairness of education and training in Europe.

The Communication responds to the fact that developments in the area of OER, such as the rise of the MOOC movement, highlight the need to develop economies of scale and remove barriers to access, use and sharing of knowledge across borders for education, if Europe is to remain competitive globally. The Communication also acknowledges the need to overcome pertinent challenges to ICT access and skills in order to reap the benefits of OER, and focuses more broadly on integrating ICT in education and training systems. Thus, incentives fostering OER development and availability are combined with measures for digital and pedagogical skills development for teachers on the one hand, and, on the other, measures to improve ICT infrastructure and connectivity for schools, including interoperability and portability standards and incentives to stimulate the market for new interactive content and learning tools.

In these three areas, three different types of actions are combined, i) financial support to organisations implementing projects in these fields; ii) tools providing online solutions; and iii) policy guidance for Member States to reform education and training systems. Most actions will be implemented through the new programmes Erasmus+ and Horizon 2020 (2014-2020), which combine more general with rather concrete measures, and exploration with implementation. These include:

- Ensuring that educational materials produced with public funding are made freely accessible to all citizens;
- Launching a European OER Portal called 'Open Education Europa' to increase the visibility of high quality European OER in several languages;
- Enhancing transparency of user rights and obligations regarding educational resources;
- Promoting open licences among communities of both teachers and policy makers, and developing technical tools to integrate metadata in each resource available on the web, to increase transparency.
- Defining interoperability and portability standards for educational resources and ensuring that these are applied across devices, platforms and brands to provide a level playing field for all market players.
- Promoting organisational change across schools, universities and training institutions to support better integration of new technologies and high quality OER.
- Launching large-scale research and policy experiments to test innovative pedagogical approaches, curriculum development and skills assessment;
- Exploring how established and emerging tools for the validation and recognition of skills, such as 'open badges', can be tailored to the needs of learners;

The main objective is to create the political will among the Member States and stakeholders like education and training institutions, publishers and the ICT industry to take coherent and coordinated action. The Commission needs to create common framework conditions to fight the traditional fragmentation and lack of continuity in national and regional policies,

based on projects that are often financially unsustainable. Furthermore, it can serve as a catalyst for increasing the knowledge base on OER in areas where uncertainties persist - like business models, the future role of teachers, the potential of learning analytics, the implications of copyright regulations on the implementation of collaborative and personalised practices, amongst others.

Launching a strong political message is considered particularly important in a period of economic crisis and financial austerity, when some public authorities may be tempted to stop supporting initiatives which aim to exploit the potential of technologies and digital content in education and training. At the same time, the explosion of MOOCs has dominated discussions on the future of higher education, even though few European universities are involved. If, on the other hand, fragmentation of policies and initiatives takes place, this would be a major obstacle to developing economies of scale at European level and to exploiting opportunities from public investments.

The new Communication aims to join forces and create synergies on the European level to make change happen in education and training, to reap the benefits of OER in all countries and for all citizens. More holistically, opening up education is seen as a starting point to creating a more innovation-friendly education and training environment.

Discussion and conclusions

Policies for the promotion of Open Educational Resources have led to passionate debates. The mere existence of OER challenges both traditional teaching and learning practices, and business models of education and training stakeholders, like publishers or universities. The very concept of OER is often under scrutiny. To what extent are OER actually free if they are often funded by public institutions or foundations? How can their financial sustainability and constant update be ensured? Are teachers ready and really interested in creating, re-using and sharing their materials? Is there enough empirical evidence about the added value offered by OER compared to traditional commercial contents? Should public authorities intervene to promote an extensive use of OER in education and training systems?

OER are a disruptive phenomenon, comparable to open source, open access or Internet file-sharing, which also challenged the traditional business models of the software industry, scientific publishers and the audio visual sector. After first considering these new phenomena as threats, these sectors were then able to integrate them, as different models and practices that co-exist and reinforce each other. In the area of OER, commercial and non-commercial actors need some time to establish common spaces in a marketplace that is radically evolving (ELIG, 2011). Similarly, education, training systems and institutions will need time to understand how best to seize to benefits of OER to innovate teaching and learning. Some teachers and learners will be fully committed to OER and Open Educational Practices, while others will combine commercial contents with OER - or even just use traditional textbooks.

OER, like the whole Internet, represent a radical cultural change. Different visions about what the Internet is and should be must be confronted. For some, the Internet is a space of freedom, characterised by social relations that allow sharing, re-using and discussing content without necessarily any commercial interest. There are several examples of this vision, the most obvious of which is probably Wikipedia. Indeed, major companies have implemented fora on their websites where their clients can discuss their problems, with very little intervention from the provider. These enterprises have understood that the Internet can be a dis-intermediated space that works on its own, and allows them to save money in post-sales services. For others, the Internet is the continuation of traditional markets, and requires adapted regulations with a centralised control. In the field of education and training, the position of policy-makers, school leaders and teachers as regards these different divides will probably lead to the support and implementation of completely different pedagogical approaches and use of web-based resources and OER.

The role of a public policy should be to create framework conditions that allow all sorts of practices and business models, without artificial barriers to innovation. A European-wide framework could stimulate the creation of digital technology tailored to education and training purposes and the supply of quality digital content, including OER. This would allow individuals, schools, training institutions and universities to be better equipped to capitalise on (past or present) public investments in upgrading ICT infrastructure. European framework conditions could also boost synergies across countries in the development of innovative teaching and learning practices and thus help to improve the quality of European education.

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[1] http://ec.europa.eu/europe2020/index_en.htm .

[2] <http://www.opencontent.org/definition/> .

[3] <http://www.ed.gov/technology/netp-2010> .

[4] According to the International Council for Open and Distance Education (ICDE), Open Educational Practices (OEP) are "practices which support the production, use and reuse of high quality open educational resources through institutional policies, which promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path". OEP can enrich the quality of the learning experience, with practices based on collaboration, contextualisation and personalisation. See: www.icde.org/en/resources/open_educational_quality_initiative/definition_of_open_educational_practices/

[5] <http://www8.open.ac.uk/score/> .

[6] www.oer-quality.org .

[7] www.OpenupEd.eu .

[8] http://europa.eu/rapid/press-release_IP-13-349_en.htm .

[9] <http://www.changemag.org/Archives/Back%20Issues/March-April%202009/full-iron-triangle.html> .

[10] <http://ministerialconference2012.linkevent.no/F%20Mulder%20parallel.pdf> .

[11] See: http://www.eua.be/news/13-02-25/Massive_Open_Online_Courses_MOOCs_EUA_to_look_at_development_of_MOOCs_and_trends_in_innovative_learning.aspx

[12] www.emu.dk .

[13] In France, for instance, teachers consider ICT instruments as complementary tools to traditional textbooks and very few think they will replace them (*Savoir Livre and Syndicat National de l'Edition, 2010*). This is confirmed by some anecdotal evidence about the use of Wikiwijs resources: it seems that those produced by commercial publishers are more successful. However, the opposite trends are appearing in other European countries. In Denmark, a survey of principals in general and vocational upper secondary education institutions, about the use of OER, showed that 7% of these institutions replaced all their educational materials with OER in 2011. Another 23% expected to do it within the coming year and 47% within 3-5 years. Only 10% said that they expected that the gymnasium would never totally replace printed materials. See: <http://www.emu.dk/gym/tvaers/it/2runde.html>.

[14] <http://www.klascement.be/> , about 69% of materials are under Creative Commons licenses.

[15] <http://lemill.net>.

[16] www.scientix.eu.

[17] <http://www.opendiscoveryspace.eu/>.

[18] <http://www.sloop2desc.eu/>.

[19] Eg. ALISON offers a low-cost, always on, competency-based testing service to employers wishing to verify that an ALISON certificate holder possesses the relevant knowledge; the site freelancer.com offers low cost, always on, competency-based tests to freelancers wishing to raise the credibility of their tenders; LinkedIn allows peer endorsement and recommendation.

[20] See: <http://www.oer-quality.org/> and <http://www.oer-europe.net/>

[21] <http://www.internetworldstats.com/stats9.htm>

[22] <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>

[23] <http://www.bgsu.edu/departments/english/cconline/open/introduction.html> .