



Exploring the relation between Open Education and International Higher Education Cooperation

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Executive Summary (English)

The present publication presents the main results and findings of the eMundus project, an activity conducted during the period 2013-2015 with the support of the Erasmus Mundus programme of the European Commission. The project involved an international consortium coordinated by SOPHIA R&I (Italy) with the Open University of the Netherlands (NL), the Universidad Internacional de la Rioja (Spain), the University of Sao Paulo (Brazil), the Universidad Autonoma Metropolitana (Mexico), the Moscow State University of Economics, Statistics and Informatics (Russia), the OER Foundation (New Zealand), Athabasca University (Canada) and the Universitas Siswa Bangsa Internasional (Indonesia).

The aim of eMundus was to strengthen cooperation among European Higher Education Institutions and their strategic counterparts in Brazil, Mexico, Russia, Indonesia, Canada and New Zealand, by exploring and mainstreaming the potential of Open Education (OE) approaches to support long term, balanced, inter-cultural academic partnerships.

This report presents a brief overview of the main results and messages of eMundus:

- First, some considerations are presented from the **fact-finding reports** drawn to identify patterns of collaboration enhanced by open education approaches, MOOCs and Virtual Mobility in the eMundus countries, specifically Brazil, Canada, Europe, Indonesia, Mexico, New Zealand and Russia.
- Second, the **eMundus online Atlas** is described, as a way to identify successful patterns of OE-enhanced international collaboration by gathering and analysing interesting and inspiring international OE practices.
- Third, the **eMundus Exploratorium** is introduced, a platform to foster sharing of Open Education approaches and tools through an online repository based on scenarios of use designed on the needs of Higher Education stakeholders.
- Fourth, the report presents the six **new forms of international collaboration fostered by Open Education** approaches that have emerged from the eMundus work.
- Last but not least, the **recommendations** resulting from the eMundus experience are presented, targeting university leaders, executives, international relation officers, academic networks and policy makers in charge of Higher Education.

eMundus has been working – in a rather pioneering way - to explore and promote the potential contribution of Open Education to XXI century academic cooperation, encouraging and supporting the transfer to universities of the best practices of world leaders in the field, especially to those which are starting to adopt strategies such as OER, MOOCs and Virtual Mobility for their internationalisation. During the project, the eMundus team, has presented the project messages in more than 120 events worldwide, and more than 500 institutions have been engaged in one way or another with the project activities. Still, the way to go to promote Open Education as a catalyst towards inclusive, intercultural and effective international cooperation among universities is long and much work remains to be done. The present publication aims at providing a “snapshot legacy” of the work done, so that others can further explore the relation between Open Education and internationalisation, for the benefit of universities around the globe.

Executive Summary (Portuguese)

A presente publicação apresenta os principais resultados e descobertas do projeto eMundus, uma atividade realizada durante o período de 2013 a 2015 com o apoio do programa Erasmus Mundus da Comissão Europeia. O projeto envolveu um consórcio internacional coordenado por SOPHIA R&I (Itália) com a Universidade Aberta dos Países Baixos (PB), a Universidade Internacional de La Rioja (Espanha), a Universidade de São Paulo (Brasil), a Universidade Autônoma Metropolitana (México), a Universidade Estadual de Moscou de Economia, Estatísticas e Informática (Rússia), a Fundação REA (Nova Zelândia), a Universidade Athabasca (Canadá) e a Universidade Internacional Siswa Bangsa (Indonésia).

O objetivo do eMundus foi de estreitar a cooperação entre as instituições de Educação Superior Europeias e seus parceiros estratégicos no Brasil, México, Rússia, Indonésia, Canadá e Nova Zelândia, explorando o potencial das abordagens da Educação Aberta (EA), a fim de apoiar as parcerias acadêmicas internacionais, balanceadas e de longo prazo.

Este relatório apresenta uma breve visão dos principais resultados e mensagens do eMundus:

- Primeiro, algumas considerações são apresentadas a partir dos **relatórios de fatos descobertos** trazidos para identificar padrões de colaboração realçados por abordagens de educação aberta, MOOCs e Mobilidade Virtual nos países do eMundus, especificamente Brasil, Canadá, Europa, Indonésia, México, Nova Zelândia e Rússia.
- Segundo, o **Atlas eMundus online** é descrito como uma forma de identificar padrões exitosos de melhoria da colaboração internacional de EA por meio de coleta e análise de práticas internacionais de EA interessantes e inspiradoras.
- Terceiro, o **Exploratório do eMundus** é apresentado; é uma plataforma para promover o compartilhamento de abordagens e ferramentas de Educação Aberta através de um repositório online baseado em cenários de uso desenhados para as necessidades dos interessados em Educação Superior.
- Quarto, o relatório apresenta as seis **novas formas de colaboração internacional promovidas por abordagens de Educação Aberta** oriundas do trabalho do eMundus.
- Finalmente, mas não menos importante, são apresentadas as **recomendações** resultantes da experiência do eMundus, visando líderes universitários, executivos, gestores de relações internacionais, redes acadêmicas e agentes políticos responsáveis pela Educação Superior.

O eMundus vem trabalhando – de uma certa forma pioneira – para explorar e promover a contribuição potencial da Educação Aberta para a cooperação acadêmica do século XXI, encorajando e apoiando a transferência das melhores práticas dos líderes mundiais da área para as universidades, especialmente para aquelas que estão começando a adotar estratégias, tais como REA, MOOCs e Mobilidade Virtual para sua internalização. Durante o projeto, o time do eMundus, apresentou as mensagens do projeto em mais de 120 eventos mundiais, e mais de 500 instituições se engajaram, de uma forma ou de outra, com as atividades do projeto. Promover a Educação Aberta como catalizadora de efetiva cooperação internacional, intercultural e inclusiva entre universidades é um trabalho longo e ainda há muito a ser feito. A presente publicação visa fornecer um “pequeno legado” do trabalho realizado para que outros possam explorar a relação entre Educação Aberta e internacionalização, para o benefício das universidades do globo.

Executive Summary (Spanish)

Esta publicación presenta los principales resultados y hallazgos del proyecto eMundus, desarrollado en el período 2013-2015 con el apoyo del Programa Erasmus Mundus de la Comisión Europea. El proyecto fue llevado a cabo por un consorcio internacional de instituciones, coordinado por SOPHIA R&I (Italia). Dicho consorcio estuvo integrado por: Open University of the Netherlands (Holanda); la Universidad Internacional de La Rioja (España); La Universidad de San Pablo (Brasil); la Universidad Autónoma Metropolitana (México); Moscow State University of Economics, Statistics and Informatics (Rusia); OER Foundation (Nueva Zelanda); Athabasca University (Canadá) y la Universitas Siswa Bangsa (Indonesia).

El objetivo de eMundus fue fortalecer la cooperación entre Instituciones de Educación Superior Europeas y sus contrapartes estratégicas en Brasil, México, Rusia, Indonesia, Canadá y Nueva Zelanda, explorando e integrando el potencial de los enfoques de Educación Abierta (EA) para apoyar la cooperación académica de largo plazo, balanceada y de carácter intercultural.

Este reporte brinda un breve panorama de los principales resultado y mensajes de eMundus:

- Primero, se presentan algunas consideraciones sobre los **Reportes de Hechos** elaborados para identificar patrones de colaboración, mejorados por el enfoque de educación abierta, MOOCs y la Movilidad Virtual en los países de eMundus; específicamente Brasil, Canadá, los países europeos, Indonesia, México, Nueva Zelanda y Rusia.
- Segundo, se describe al **Atlas eMundus en línea** como un medio para identificar patrones exitosos de mejora en la colaboración internacional con base en EA, reuniendo y analizando experiencias internacionales de EA interesantes e inspiradoras.
- Tercero, se presenta al **Exploratorium eMundus** como una plataforma para promover la colaboración de enfoques y herramientas de Educación Abierta, mediante un repositorio en línea basado en escenarios de uso diseñado para las necesidades la Educación Superior de los participantes.
- Cuarto, el reporte presenta **seis nuevas formas de colaboración internacional impulsadas por el enfoque de Educación Abierta**, surgidas del trabajo de eMundus.
- Último pero no menos importante, se presentan las **recomendaciones** resultantes de la experiencia de eMundus, dirigidas a líderes de universidades, ejecutivos, oficinas de relaciones internacionales, redes de académicos y elaboradores de políticas responsables de la Educación Superior.

eMundus ha estado trabajando – de una manera pionera- para explorar y promover la contribución potencial de la Educación Abierta para la cooperación académica en el Siglo XXI, alentando y apoyando la transferencia a las universidades de las mejores prácticas de los líderes mundiales en este campo. Especialmente hacia aquellos que están comenzando a adoptar estrategias tales como los OER, MOOCs y la Movilidad Virtual para su internacionalización. Durante el proyecto el equipo de eMundus ha presentado el mensaje del proyecto en más de 120 eventos a nivel mundial, y más de 500 instituciones han sido vinculadas de una u otra manera en las actividades del proyecto. Sin embargo, el camino para promover la Educación Abierta como un catalizador hacia la cooperación internacional incluyente, intercultural y efectiva es todavía largo y queda mucho trabajo por hacer. La presente publicación desea proveer un “legado fotográfico” del trabajo realizado, de modo que otros puedan realizar nuevas exploraciones sobre la relación entre la Educación Abierta y la internacionalización, para el beneficio de las universidades en el mundo.

1. Introduction

The present publication presents the main results and findings of the eMundus project, an activity conducted during the period 2013-2015 with the support of the Erasmus Mundus programme of the European Commission. The project involved an international consortium coordinated by SOPHIA R&I (Italy) with the Open University of the Netherlands (NL), the Universidad Internacional de la Rioja (Spain), the University of Sao Paulo (Brazil), the Universidad Autonoma Metropolitana (Mexico), the Moscow State University of Economics, Statistics and Informatics (Russia), the OER Foundation (New Zealand), Athabasca University (Canada) and the Universitas Siswa Bangsa Internasional (Indonesia).

The starting point of eMundus was that the Open Education movement, with its emphasis on Open Educational Resources (OER), MOOCs (Massive Open Online Courses) and Virtual Mobility, is challenging the existing Higher Education internationalisation paradigms, having the potential to radically change the approaches to educational mobility, transparency, quality assurance and effectiveness.

Against this background, the aim of the project was to strengthen cooperation among European Higher Education Institutions and their strategic counterparts in Brazil, Mexico, Russia, Indonesia, Canada and New Zealand, by **exploring and mainstreaming the potential of Open Education approaches to support long term, balanced, inter-cultural academic partnerships.**

To reach this aim, the project has been working along three main lines:

- **Mapping the state of the art of Open Education** in higher education in the partners' countries, facilitating the identification of successful patterns of ICT-enhanced international collaboration, through a number of reports and an online Atlas presenting interesting and inspiring international OE practices.
- **Fostering sharing of Open Education approaches and tools** through an online repository and through a number of face-to-face and online knowledge-exchange events involving both Open Education and internationalisation specialists.
- **Promoting the contribution of Open Education to XXI century academic cooperation**, encouraging and supporting the transfer to universities of the best practices of world leaders in the field, especially to those which are starting to adopt strategies such as OER, MOOCs and Virtual Mobility for their internationalisation.

During the project, eMundus and its messages have been presented in more than 120 events worldwide, and more than 500 institutions have been engaged in one way or another with the project activities. Still, the way to go to promote Open Education as a catalyst towards inclusive, intercultural and effective international cooperation among universities is long and much work remains to be done. The present publication aims at providing a "snapshot legacy" of the work done, so that others can further explore the relation between Open Education and internationalisation, for the benefit of universities around the globe.

2. A snapshot of Open Education from the eMundus countries

The eMundus initiative commenced with a fact-finding exercise during 2014 to identify patterns of collaboration enhanced by open education approaches, MOOCs and Virtual Mobility in the eMundus countries, specifically Brazil, Canada, Europe, Indonesia, Mexico, New Zealand and Russia. The project team agreed to a generic framework to facilitate comparisons and identification of key themes and trends. The country reports were developed openly and published on the Wikieducator.org site (WikiEducator 2014a). As of November 2015, these reports have recorded over 11,000 page views since publication and will remain openly accessible.

2.1 Summary of Country demographics

The eMundus participants included a wide and diverse set of countries when considering the extensive list of European countries and non-European partners including Brazil, Canada, Indonesia, Mexico, New Zealand and Russia. Consequently, it is challenging to do justice to the rich data and reports assembled for the project in this summary. This section is limited to the identification of important trends which have informed the subsequent phases of eMundus. With reference to size, participating countries ranged from New Zealand with a small population of just over 4 million people to some of the most populated countries in the world including Indonesia, Brazil and Russia ranked the fourth, fifth and ninth most populated countries, with populations ranging from 144 million to 255 million people (One World Nations Online: 2015). Gross enrolment ratios for tertiary education participation varied considerably across the eMundus countries ranging from 30% to 80% (UNESCO 2014) with the average gross enrolment ratio for the European Union reported by the World Bank to be 66.5% (Knoema 2015). In countries with lower participation rates, the growth in tertiary education participation has in part been taken up, by the increased provision of private education, as in the case of Brazil (WikiEducator 2014b) and Mexico (WikiEducator 2014c). Clearly, there are still large numbers of learners who are unable to participate in tertiary education through traditional models of provision and the majority of countries have reported decreased funding for higher education thus underscoring the need to find more cost-effective ways of reaching more students. Internet access also varies considerably across the eMundus countries. So for example, the report on Mexico indicates that the country is one of the worst in the region for home internet access (WikiEducator 2014c). Notwithstanding the disparities of affordable and reliable Internet connectivity in countries like Brazil, Mexico and Indonesia, two significant trends are evident. First the country reports confirm rapid growth in Internet connectivity. For instance, in Indonesia, the number of Internet users increased from 55 million in 2011 to an estimated 74.6 million in 2012 representing an increase of 36% in one year although the Internet penetration rate for the population is relatively low at 29.9% (WikiEducator: 2014d) when compared with a rate of 78.5% in the European Union in 2014 (Internet World Stats: 2015). The second significant trend noted in a number of the country reports is the growth in access to the internet using mobile devices. In Brazil, for example, 23.3% of Brazilians are using their phones to access the Internet and Routers has forecast that Brazil will become the largest mobile phone market in Latin America (WikiEducator 2014b). The European Union is ranked as having the 3rd highest number of mobile subscribers in the world (Central Intelligence Agency: 2014). In Indonesia, it is predicted that there will be 119 million mobile device users by 2017 that is double the total number of Internet users in 2011 (WikiEducator: 2014d). Access to the Internet from mobile devices is surpassing connectivity from personal computers and this generates significant opportunities for widening access to educational opportunities.

In summary, the demographic snapshot revealed that there is unsatisfied demand for tertiary education within the eMundus countries within the context of growing fiscal constraints. There is variable access to the Internet. However, access is growing rapidly with a clear trend towards significant growth in accessing the Internet using mobile devices and smartphones.

2.2 Open education initiatives

Open Education in the context of this report is used as an umbrella concept which incorporates emerging international practices in the formal education sector associated with Open Educational Resources (OER), Open Educational Practices (OEP), Open Access (OA) and Open Licensing.

The policy imperative for more sustainable education futures is best highlighted through the open policy principle: education resources funded from public money should be released under an open license for the benefit of citizens. The open licensing principle was endorsed by the 2012 Paris OER Declaration at the the World OER conference convened by UNESCO and encourages United Nations member states to release educational materials using open licenses (UNESCO 2012). While the open access movement has made impressive progress in reaching the “tipping point” where half of the scientific papers published are now available for free (European Commission 2013), international research data suggests that awareness of Open Educational Resources is still lagging. Consider for example that only 28% of chief academic officers in the United States reported being “Aware” or “Very Aware” of OER (Allen & Seaman 2012: 4).

Creative Commons which was established in 2001 has established the de facto licensing standard used for OER worldwide. The eMundus country reports have noted that there is a national Creative Commons affiliate in the majority of partner countries thus providing an international and interoperable legal framework for reuse and remix of OER. Historically, the Creative Commons affiliates took on responsibility of “porting” the licenses for the national copyright jurisdictions. However, with the recent Version 4 of the Creative Commons licensing suite which is more internationally robust, national affiliates are taking on a stronger role in advocacy and copyright reform for the digital age thus furthering the aims of the open policy principle in their jurisdictions.

The eMundus country reports confirm that there is a rapidly growing groundswell of OER related initiatives at government and institutional levels. Consider the following:

- *Examples of Government funded open education initiatives:* In Canada, the Government of British Columbia has invested a cumulative total of more than \$10 million through the Online Programme Development Fund towards shared open resources. This investment in sharing education resources has continued through funding of the Open Textbook Project that is developing open textbooks for the highest enrolled academic subject areas coordinated by BCCampus. This initiative was followed by a Memorandum of Understanding on Open Educational Resources between the western provinces of Alberta, British Columbia and Saskatchewan committing significant resources to cooperation on the development of OER (WikiEducator 2014e). In 2010 Cabinet approved the New Zealand Government Open Access and Licensing Framework (NZGOAL) which encourages Crown entities to license copyright works under a Creative Commons Attribution (CC-BY) license. Under NZGOAL, school boards are strongly encouraged to adopt Creative Commons license policies and Government provides financial support to Creative Commons Aotearoa New Zealand, the national affiliate of Creative Commons. Previously, in the United Kingdom between 2009 and 2012, the Higher Education Funding Council for England funded more than 80 projects under the UKOER Programme (WikiEducator 2014f). European agencies have also funded a number of leading OER initiatives. For instance, the POERUP (Policies for OER Uptake) and the Open Educational Quality Initiative (OPAL), funded by the European Commission, to mention a few (see reference links in WikiEducator 2014f). The European Commission has also launched the Open Education Europa portal which provides a gateway to OER in Europe.
- *A wide range of institutional OER activities gaining momentum in all eMundus partner countries.* The eMundus country reports (WikiEducator 2014a) list a wide range of OER related activities in all partner countries incorporating: Open Access, use, reuse and creation of OER and capability development initiatives focused on building knowledge and skills in OEP. The POERUP (2014) study has also generated

detailed country reports documenting OER development in many European countries (see also WikiEducator 2014f). The study has observed progress in the university sector with the adoption of OA friendly policies for sharing research in a number of countries. However, at the institutional level, adoption of OER and open intellectual property policies is lagging in eMundus countries. The study was only able to identify Otago Polytechnic in New Zealand who has adopted an institution-wide open intellectual property policy where a default Creative Commons Attribution has been implemented (Otago Polytechnic 2008).

2.3 Massive Open Online Courses (MOOCs)

The scale of uptake of Massive Open Online Courses (MOOCs) within eMundus countries is considerable with all partners reporting activity in this area. In addition to wide engagement with the for-profit MOOC platforms within eMundus we have also observed a number of OER inspired alternatives. MOOCs have a Canadian origin. The name dates to an experimental course led by George Siemens at the University of Manitoba and Stephen Downes at the National Research Council in 2008. They opened up a regular university course, *Connectivism and connective knowledge*, with 25 students and more than 2200 additional learners joined the course online. As Siemens reports, this course, delivered in 2008, was the first MOOC, combining open content with open teaching (WikiEducator 2014e).

Since the origins of the first MOOC, more teacher-centric MOOCs have evolved when compared to the original connectivist MOOC. Stephen Downes coined the term cMOOC to describe their connectivist course and referred to the teacher versions as xMOOCs (WikiEducator 2014e). Many MOOC delivers are aligned with for-profit companies like Coursera in the United States and the FutureLearn initiative of the Open University in the United Kingdom. Others are aligned with the not-for-profit EdX group led by the Massachusetts Institute of Technology. The majority of eMundus partner countries have reported institutions who are engaged with one or more of the xMOOC providers. Other than providing access to online learning materials for free, xMOOCs typically are using copyright restricted content. The majority of the xMOOC course materials use all rights reserved copyright and are not “open” for reuse and remix. Learners are also typically required to register before gaining access to these so-called “open” courses. Moreover, the majority of xMOOCs do not typically provide learners with pathways to formal academic credit.

There are, however, a number MOOC initiatives within eMundus partner countries which have stronger associations with open education. For instance, In Russia, there are a growing number of platforms (for example Universarium.org and UniWeb.ru) that offer MOOCs from Russian universities and registered full-fee students are able to earn academic credit from these open courses (WikiEducator 2014). The Russian MOOC platforms have a strong cultural and national identity by promoting the Russian language. In Europe, the nascent OpenupEd initiative with support from the European Commission has launched a non-profit partnership offering MOOCs. A distinctive feature of the OpenupEd initiative is the development and implementation of a “quality label” as a condition of joining the collaboration which requires the endorsement that courses will be openly licensed (Rosewell 2014). Finally, while not branded as a MOOC collaboration, the OER universitas (OERu) international consortium of more than thirty universities, colleges and polytechnics offer open online courses assembled from OER with pathways to achieve formal academic credit towards credible credentials.

2.4 Virtual mobility

Virtual mobility as concept can be used in multiple contexts. In Europe, the concept of virtual mobility has previously been defined to refer to the use of “Information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility but without the need to travel” (Bijnenes, Boussemaere, Rajagopal, Op de Beeck & Van Petegem 2006: 5). So for example, virtual mobility could refer to

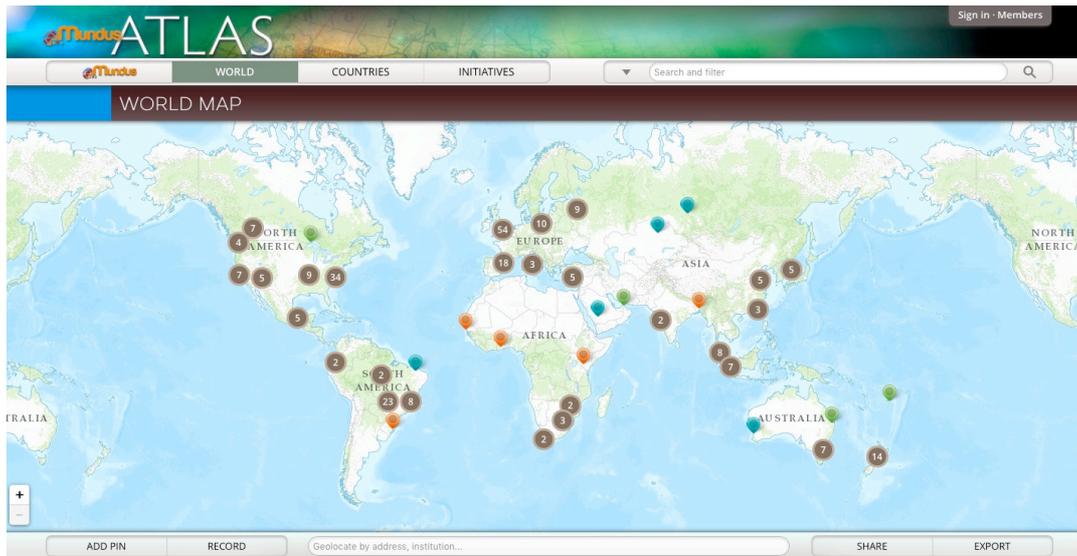
international student exchange interventions using “ICT supported activities that release or facilitate international, collaborative experiences in a context of teaching and/or learning” (Move-IT: Undated).

The eMundus project was designed to focus on the nexus of higher education, OER and virtual mobility on a global level. Consequently, the eMundus country reports opted to filter their research using a narrowly defined focus for virtual mobility specifically referring to higher education learners using institutions outside of their own countries for academic study without the need of leaving their home countries to gain formal academic credit towards credentials. This definition does not preclude the advantages of international exchange, the benefits of intercultural learning experiences or the flexibility of online study but it intended to provide a clear focus for filtering initiatives in the overlapping domains of the formal higher education sector, OER and MOOCs. With the uptake of OERs and MOOCs, virtual mobility is a growing phenomenon because students are no longer limited to local institutions but do want their learning accepted and accredited (WikiEducator 2014e). Notwithstanding the need for progressing virtual mobility using OER and MOOCs, there is little international standardisation and implementation solutions for wide stream adoption evident from the eMundus country reports.

There are two primary mechanisms to progress virtual mobility and corresponding recognition of academic credit across national and regional boundaries: recognition of prior learning (RPL) and academic credit transfer (McGreal, Conrad, Murphy, Witthaus & Mackintosh: 2014). RPL is frequently used to accredit learning which takes place outside the classroom and relies on portfolio models to provide evidence of learning. However RPL is expensive and difficult to scale for a large numbers of learners. Challenge for credit examinations are used by a small number of institutions within the eMundus countries and could potentially provide an affordable pathway for OER and MOOC learners to sit examinations for achieving formal credit (see for example WikiEducator 2014e) at the conferring institution, however this does not resolve the virtual mobility challenge. However, the OERu collaboration discussed later in this report provides an example of potential solutions for virtual mobility.

3. Mapping Open Education developments: the eMundus Atlas

The eMundus Atlas is an online world map to locate initiatives involving MOOCs, virtual mobility, and Open Educational Resources (OER). The Atlas was opened to the research community and general public in September 2014, and currently contains the locations, metadata, and profiles of 277 initiatives. The site can be viewed at emundusatlas.org.



3.1 eMundus Atlas Features

The eMundus Atlas includes two primary views: a world map locating individual initiatives and a choropleth (“heat map”) illustrating countries’ relative levels of activity in initiative development. The world map provides an intuitive, graphic interface (panning and zooming) to explore the initiatives, as well as filtering, searching, and geolocating tools to locate initiatives or regions of interest. It also includes “quick” and “full” methods for adding new initiatives to the database, the “quick” method taking place entirely within the frame of the map itself. As the map is explored, the current map state can be shared through a custom URL, through social media, or through an embed code recreating the map on a smaller scale for use in blogs and other websites; initiatives in the current map view can also be exported as data. The choropleth (“heat map”) provides a comparative overview of initiative development by country, selectable between initiatives located (or developed) within the country and initiatives located outside the country’s borders. Individual countries can be explored further through country profile pages, which feature a map locating the country’s initiatives, demographic statistics, and a diagram illustrating its position within a global collaborative network. Additional screens include infographics breaking down the initiatives by category, education level, subject area, and language, as well as overall charts of initiative development by continent and levels of openness and collaboration.

A search-and-filter window on every screen returns weighted sets of initiatives as a list, on the world map, or as exportable data. Detailed information about each initiative is presented on an initiative profile page, with a map illustrating its location, a summary description, additional metadata including contact and funding details, and a list of related or nearby initiatives for further exploration.

3.2 The Atlas community and contributions

The eMundus Atlas has an open membership with onsite sign-up. A current member list and an infographic of their distribution by country is available on the site. Through web forms, members can add new initiatives to the database and alter those they have previously added; a Post button is included on the home page and the world map to encourage contributions. While there is some ongoing curation, including an initial injection of initiatives, it is expected that new entries will come from the Atlas community. “Spambots” are excluded through a number of relatively non-intrusive security checks, and to date, there has been no abuse of this open membership system.

Data in the Atlas (other than member data and email addresses) is openly available for export or use by other applications. The data is licensed under the Open Data Commons - Public Domain and Dedication License, while additional site content is licensed under the Creative Commons Attribution 4.0 International License. Initiatives data can be downloaded in full, filtered by user-selected criteria, or selected through the map-based interface, allowing for a high level of control over the data output to support a wide range of potential uses. Through cross-origin resource sharing (CORS) and representational state transfer (REST), external sites can query the Atlas initiative database directly, enabling the Atlas’s data store potentially to act as the backbone to applications beyond the Atlas itself. The initial data structure was developed in consultation with other OER mapping initiatives active at the time, including the POERUP map. As other OER mapping initiatives such as the Hewlett-funded OER World Map finalize their own data import and export tools, it is expected that the Atlas will adjust its outputs accordingly to allow for the greatest possible interchange of data between projects. In addition, the Atlas developer is currently researching extensions to standardize further the exported data according to the resource description framework (RDF), making the data available to the broader and growing linked data community.

3.3 Responses to the eMundus Atlas

The Atlas was presented at the ICDE Conference of September 2014 in Paris by the Atlas project manager, Rory McGreal of Athabasca University. Participants at the presentation described the Atlas as “very impressive”, with EU officials emphasizing the Atlas as a “most important” component of the eMundus project. The Atlas was again presented to the international open education community at the OE Global Conference of April 2015 in Banff, Canada, through a panel session including the Atlas developer, Dan Wilton from Athabasca University. During the session, the various features and protocols of the Atlas were described alongside those of other OER-mapping initiatives, including the Hewlett-funded OER World Map, followed by a discussion of strategies for improving the generation and sharing of data between these initiatives. Following the panel session, the Atlas was described by the project manager of Policies for OER Uptake (POERUP) as being at the most advanced stage of all the mapping initiatives presented. Subsequently, the developer has been approached by the manager of POERUP, by a researcher at the University of Campinas, and by a collaborator with the OCT Association (Overseas Countries and Territories of the EU) to explore the potential of the Atlas software to support further OER-related initiatives. The Atlas’s developer remains directly involved with the project, providing ongoing monitoring, maintenance, data curation, and modifications to the site and underlying code as required. As new OER mapping projects come online, and as standards develop in this area, it will become increasingly important to add and refine import and export options and participate in a growing community of open and linked OER data. It is also expected that, with new data, there will be opportunities for new and valuable analytics and visualizations of open education resources and collaborations around the globe.

4. Building capacity for Open Education: the eMundus Exploratorium

The eMundus Exploratorium is a collective platform gathering and offering tools & practices focused on Open Education which aim to facilitate international collaboration in Higher Education through Open Education initiatives such as MOOCs or Virtual Mobility. It is focused on identifying, analysing and making available to a large public the most successful ICT tools and practices that can help international collaboration among universities to flourish and develop, and on discussing the impact of these tools and practices on issues such as employability, quality assurance, credit recognition, joint degrees.

4.1 eMundus Exploratorium Functionalities

In order to allow meaningful browsing and capacity building, the Exploratorium is structured through a set of scenarios, based on cases where Open Education can have a significant impact on internationalisation. In addition, all the resources and tools are listed in the Resources section. Each item comes with a small description; users are free to add their own items, as long as they fit with the objectives of the Exploratorium. Fora are also an important part of the Exploratorium, as they give the opportunity for users to share their experience, opinion, doubts and suggestions, and exchange with other educators and professionals on specific subjects related to Open Education Approaches and international collaboration. The Exploratorium uses Sakai, a free, community source, educational software platform using an open source license, which allows an open and global access to everyone through the following link: <http://tel.unir.net/eMundus-portal>.

4.2 eMundus Exploratorium Scenarios

The eMundus scenarios define different cases in which users can recognize themselves, depending on their situation and objectives. Scenarios are usually fictional but can be real cases, in English or other languages. eMundus scenarios deal with the main objective of the project: enhancing international collaboration through Open Education Approaches. They are grouped under three categories. First, teachers who want to create a MOOC or an Open Course can find existing open materials and tools to help assemble the course, and have the opportunity to share their own tools and experience. Second, teachers who want to add a virtual component to the existing teaching cooperation with colleagues can browse Virtual Mobility success stories to share with managers and policymakers, and explore eMundus tools to make it happen. Third, HE managers who want to enhance the quality of the institution's educational offer by increasing international cooperation can discover how other universities have implemented MOOCs and Virtual Mobility and raise their institutional profile through these innovative practices.

Some example scenarios are hereby described:

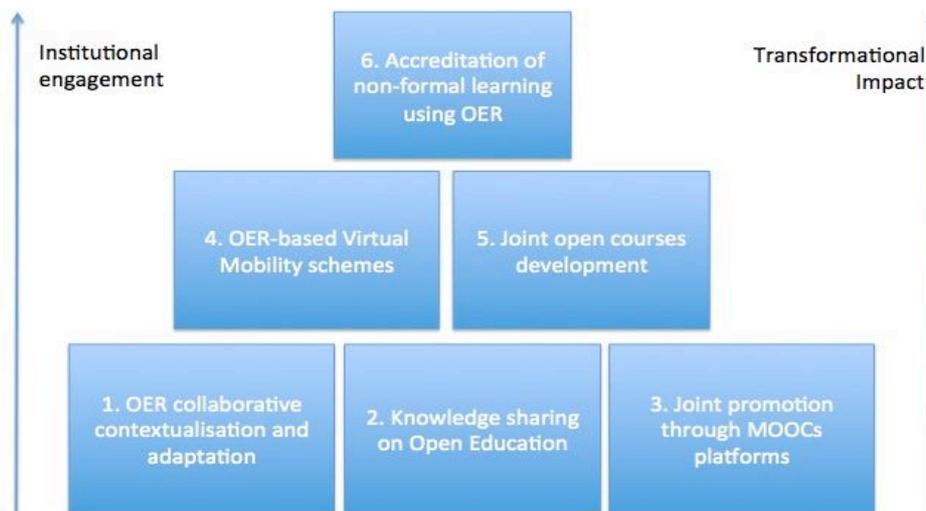
- You teach at a Higher Education Institution and you want to create a MOOC? Professor Tim Robinson (fictional) has been teaching the same class on Basic Arithmetic for over 10 years at a medium-size university in United Kingdom, based on traditional, face-to-face learning. He is thinking about creating his own MOOC, so to reach a wider community of students, develop professionally and foster international cooperation with other professionals. However, he is not much experienced on eLearning technologies and he does not have the resources to create his MOOC by himself.
- “Digital Psychology”: how content curation can be used for educational purposes. There are a lot of resources disseminated on the Internet, from psychological experiments conducted and recorded in the early 20th century, to letters and manuscripts written by some of the most prominent psychologists; not to mention ongoing psychology research projects, archives and labs which contents could be curated for learning and teaching purposes. An associate lecturer in psychology has seen how positively students react when presented with curated content. Most teachers and tutors use digital resources that are extremely

popular among students; however, some of them don't know all the possibilities and tools that content curation offers for educational purposes. How teachers as well as students can learn more about content curation and how it could be applied to psychology within educational contexts?

- CLIL teachers sharing video postcats: evaluating and learning teaching practices. Multilingualism is a hot issue in Europe, and one of the educational goals of many countries nowadays. One of the common approaches that many educational institutions have adopted to develop bilingualism and multilingualism is CLIL (Content and Language Integrates Learning). A lecturer in an online university in Spain, who teaches didactics of the English language in pre-school and primary education grades, has observed that the complexity of CLIL, and particularly how the teacher is expected to perform in class, is one of her students' major worries. A teacher's discourse is not just words. As any other oral communicative event, visual cues, such as gestures or facial expressions help to meet educational objectives, and these are even more relevant when communication is through a foreign language. This scenario aims at creating a network of current and prospective CLIL teachers, where the former can share examples of their daily practices and video recordings. An online platform for foreign language teachers to share video podcasts has been created. This helps them to evaluate their teaching, and can provide prospective teachers with examples of good teaching practices.

5. Emerging forms of international collaboration enabled by Open Education

eMundus has been analysing the state of the art of Open Education in a number of countries, and has collected practices that are having an impact on the way universities collaborate internationally. This knowledge base has been the basis for a number of discussions with stakeholders in workshops organised in the partners' countries, where the impact of Open Education on international Higher Education cooperation has been debated. During this process, six new forms of international collaboration which are fostered by Open Education approaches have emerged.



1. OER collaborative contextualisation and adaptation. Probably because the Open Education movement started its work by focussing on licenses and content, this is the most advanced typology of international collaboration supported by Open Education, both in terms of existing cases and research literature. Ultimately, the main added value of OER stands in their reusability, typically following a contextualisation process: when this adaptation process is run in collaboration among the institutions that have produced the OER and the ones that are reusing them, the impact on the participating universities can be very high, especially in terms of cultural difference appreciation and language learning.

2. Knowledge Sharing on Open Education. In line with the underlying open philosophy of the Open Education movement, a number of national and international platforms and communities exist where universities share knowledge and learn from each other on topics related to Open Education. Examples are the *REA Brasil* community or *Jorum*, the UK's largest repository and search facility for OER targeting higher education, further education, and skills educators.

3. Joint promotion through MOOCs platforms. A number of national and cross-national web platforms gathering MOOCs from different universities have been launched in the last years, such as Futurelearn in the UK or OpenUpEdu at the EU level. The most interesting cooperation aspect of such platforms is not the joint production of MOOCs - none of the MOOCs offered thus far has been produced by more than one university – but the fact that by participating in the platform, universities exchange knowledge and collaborate on fundamental aspects of international collaboration, on aspects such as (in the OpenUpEdu case): 1. Openness to learners, 2. Digital openness, 3. Learner-centred approach, 4. Independent learning, 5. Media-supported interaction, 6. Recognition options, 7. Quality focus, and 8. Spectrum of diversity.

4. OER-based Virtual Mobility schemes. Since Virtual Mobility schemes are often using collaborative approaches, especially to facilitate knowledge sharing between resident students and “virtually visiting” ones, open approaches have the potential to improve the transparency, the efficiency and ultimately the impact of these experiences. In the case of virtual mobility experiences that aim to prepare for a physical mobility period, being able to access what previous students have produced, discussed and ultimately learnt can be extremely useful: by adopting open licenses and by fostering access to content previously developed by fellow students this knowledge accumulation process can be made easier and less costly.

5. Collaborative open courses development. Co-developing open courses across national boundaries is an extremely complex process which deals with curriculum, cultural and linguistic differences, among others. On the other hand, such collaborative ventures can represent a rich space for experimentation with online teaching and learning. As an example, EMMA – European Multiple MOOCs Aggregator – is a project funded by the European Commission[1] which has put in place a platform to support ICT-based innovation in HE approaches where participating universities can build together courses that can be then delivered across the board. Differently from the platforms that aim at aggregating courses produced by different universities such as Coursera or FutureLearn, within EMMA the courses are built in cooperation by more than one university: this is facilitating hands-on discussions and developments in innovative teaching methodologies and learning approaches through the large-scale piloting of MOOCs, providing a system for the delivery of free, open, online courses from diverse universities, promoting cross-cultural and multilingual learning.

6. Collaborative accreditation of non-formal learning using OER. The most advanced example in this area is the [OER universitas](#) (OERu), a “global consortium of post secondary institutions whose collaboration around assessment and accreditation of learners studying online and using OER” (McGreal, Conrad, Murphy, Whithaus and Mackintosh 2014: 125) The OERu is developing a “parallel learning universe” by assembling university-level courses from OER, offering these at no-cost to learners and providing pathways to formal academic credit towards credible credentials (Mackintosh, Taylor and McGreal 2011). While further research on the establishment of cross-border systems of articulation and transfer have been recommended (McGreal, Conrad, Murphy, Whithaus and Mackintosh 2014: 125) the OERu partnership has made impressive progress with the consultative development of credit transfer and course articulation guidelines for the network (OERu 2015). The OERu first graduate participated in a first-year prototype OER course developed by the University of Southern Queensland in Australia and applied her credits assessed in Australia towards a credential at Thompson Rivers University in Canada, providing evidence that the model works in practice (OERu 2014). Apart from building courses from OER using open licenses and implementing open educational practices through collaborative and open design approaches, all planning and meetings are conducted openly and transparently, enabling the OERu network to develop accreditation protocols for non-formal learning towards credible degrees.

6. Recommendations

eMundus has found that open approaches can have a positive impact on international collaboration practices, increasing not only trust and mutual understanding but also the efficiency and innovation of international cooperation. At the same time, the relation between open education and International cooperation is rather unexplored, mainly because collaboration practices fostered by open education are rather new and evolving. To address this, eMundus is proposing a set of recommendations targeted to three stakeholder categories: first institutional leaders, executives, and international relation officers within universities, second academic networks and third policy makers (possible change agents) in Higher Education.

Recommendations for university leaders, executives, international relation officers

- ✓ Include Open Licenses and OER as a fundamental default component of your cooperation agreements (good example: the open intellectual policy of the [Otago Polytechnic](#)).
- ✓ Empower your learning design centres to foster the assembly, use and reuse of OER, since this will foster collaboration by definition (good example: the OER strategy of the [University of South Africa](#)).
- ✓ Include open licences and OER in your strategic planning “in a reasonable way” (good examples: the strategies of the [Otago Polytechnic](#) and of the [Open University of the Netherlands](#)).
- ✓ Build digital skills and capability in the collaborative assembly, use and reuse of OER (Good example: the open online UNESCO course on "[Digital Skills for Collaborative OER development](#)").
- ✓ Accept accreditation of learners based on assessments of their knowledge and skills, whether learnt using OER pathways or by other means, thus fostering (virtual) mobility (good example: [OER Universitas](#)).

Recommendations for academic networks

- ✓ Identify and engage the OER champions among your members and partners (starting from the [UNESCO/ICDE Chairs on OER](#)).
- ✓ Foster awareness of Open Education and the benefits and challenges of OER among your members and partners (using for example the [UNESCO OER site](#) or the [OER Knowledge Cloud](#)).
- ✓ Ensure that educational content quality considerations and requirements are the same for commercial/copyrighted content and OER, since quality is best judged by the effectiveness of the material in transferring knowledge, not by its appearance, nor by the type of licence.
- ✓ Facilitate community building for sharing and discussing good practices, experiences and open resources enabled and moderated by community members themselves.
- ✓ Connect to existing open education networks (such as [OER Universitas](#) and [ICORE](#)).

Recommendations for policy makers in charge of Higher Education

- ✓ Include open licences as the default in your content policies (good examples: the [European Commission' Opening Up Education policy](#), the [Philippines' Open Distance Learning Act](#) and the [Canadian Tri-Agency Open Access Policy on Publications](#)).
- ✓ Accept accreditation based on the assessment of learners knowledge and skills acquired using OER through challenge examinations and Recognition of Prior Learning (good examples: [Athabasca University](#); [Excelsior College](#)).
- ✓ Reward Open Education innovators and practitioners through competitions and incentives (good example: the [BCcampus](#) in Canada and [Universidade Federal do Parana](#) in Brazil).
- ✓ Connect with other policy makers leading in open education developments (good example: the [Opening Up Slovenia](#) policy).
- ✓ Develop, promote and assess your Open Education policies and openly share their evaluation results.

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