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Cross-border Content

Investigation into Sharing Curricula across Borders and its Opportunities for Open Education Resources

Giles Pepler, Sara Frank Bristow, Paul Bacsich
Nick Jeans, Riina Vuorikari

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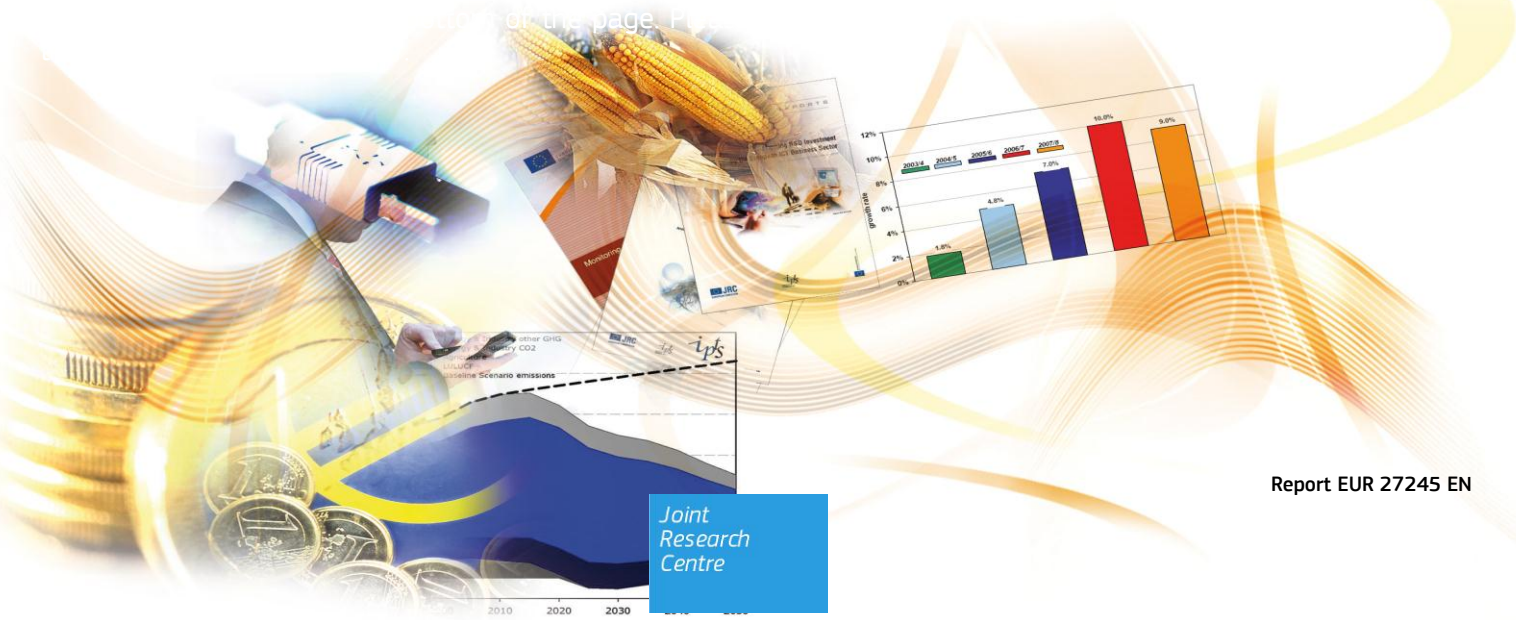

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Contact information
Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

https://ec.europa.eu/jrc
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Abstract

The aim of this study was to make an inventory of the existing cases in formal education (school sector, vocational education and higher education) where a curriculum or syllabus is shared across borders (e.g. state, national, linguistic and cultural). Based on the analysis of the desk research and a case study, further considerations was given to the potential cross border sharing of curricula/syllabi could have for Open Educational Resources, either existing or prospective.

The study was conducted in three parts. The first involved scoping and classifying cross-border syllabi/curricula initiatives and their drivers. This was followed by a detailed case study of the US Common Core State Standards Initiative and its impact on OER. These two parts are brought together in this final report and the research findings and they issues they raise are discussed. Finally, the report identifies potential areas for investigation to leverage synergies between cross-border syllabi/curricula and OER in the context of formal education in the EU.

The report calls for visionary multi-stakeholder initiatives in the area of cross-border curricula and education that could offer viable collaboration on Open Educational Resources. This could benefit not only single Member States, but also create an outlook that, in the longer term, might form a pillar of the development of a European connected digital single market, for example for boosting digital skills and learning.

Foreword

On 25 September 2013, the Commission presented a new Communication on “Opening up Education: Innovative teaching and learning for all through new technologies and Open Educational Resources”, COM(2013) 654 final. The aim of the initiative is to bring the digital revolution to education with a range of actions in three areas: open learning environments, open educational resources, and connectivity and innovation. The initiative contributes to the Europe 2020 strategy, acknowledging that a fundamental transformation of education and training is needed to address the new skills and competences that will be required if Europe is to remain competitive, overcome the current economic crisis and grasp new opportunities.

The aim of this study was to make an inventory of existing cases within the context of formal education (school sector, vocational education and higher education) where a curriculum or syllabus is shared across borders (e.g. state, national, linguistic and cultural). Based on the analysis of the desk research and a case study of the US Common Core State Standards Initiative and its impact on OER, further considerations are made for the potential of Open Educational Resources, either existing or prospective.

This report is a contribution to the construction of a knowledge base on Opening up Education and is part of a wider scientific agenda on "ICT for Learning and Skills" being developed at IPTS. More than 20 different studies and more than 50 different publications have been undertaken on Open Education and OER, Innovating Learning and Teaching, Key Competences and 21st century skills with. All studies are aimed at supporting European policies on the modernisation and innovation of E&T (DG EAC) and development of key competences and qualifications (DG EMPL) as well as addressing the Digital Agenda for Europe (DG CNECT) and more recently, the Digital Single Market (DSM) initiative under the Juncker Commission.

This study calls for visionary multi-stakeholder initiatives in the area of cross-border curricula and education that could offer viable collaboration on Open Educational Resources benefiting not only single Member States in Europe, but also potentially contributing to the European Digital Single Market initiative.

Yves Punie, Team Leader "ICT for Learning and Skills"
Riina Vuorikari, Research Fellow

Executive summary

This is the final report on the JRC-IPTS study called *A Scoping Study on the Potential of Shared, Cross-Border OER and Syllabi in Europe*. The study, conducted in the second half of 2014, aimed to investigate *cross-border content* in education and the resulting opportunities for the production and reuse of Open Educational Resources (OER).

Previous literature has identified the following cases of cross-border (re)use:

- the OER originates in a country (e.g. Spain) different from the user's country (e.g. France) and is in a different language (Spanish) from the user's mother tongue (French);
- the OER is in the user's mother tongue (e.g. German), but the user and OER come from different countries, e.g. Austria and Germany; and
- the user and the OER come from the same country (e.g. France), but the content is in a different language (e.g. English).

In terms of OER, the situation is sometimes paradoxical: even though many curricula and/or syllabi descriptions are similar in Member States, many produce their own OER in the same topic areas, e.g. Biology (e.g. human body, DNA), Calculus (e.g. differentiation, integration), Physics (e.g. motion, sound and waves). Very little cross-border reuse of OER takes place among Member States (Vuorikari & Koper, 2009).

In this study, the term *cross-border use* is extended to any curricula, or syllabi, used in the situations described above, including between states in federal countries such as the US or Germany. By curriculum, we broadly refer to a specifically-planned sequence of instruction incorporating (or not) specific content and resources. The focus was on existing cases in the context of formal education (school sector, vocational education and higher education). The research methods were based on desk research and case study methods. The study was conducted in three parts.

The goal of the study was to find further evidence of cross-border content and its use for educational purposes. The idea was to look for valuable experiences in order to identify innovative approaches and opportunities, undiscovered up until now. These would enable us to better understand how to take advantage of the potential of cross-border content for educational goals in the European Union's policy context.

The study first conducted an inventory of cases where an educational curriculum or syllabus is shared across a border. Evidence was gathered in the following three categories:

- Firstly, the evidence from the inventory of initiatives shows that **some syllabi and their content are used cross-border intentionally**, e.g. cross-country curricula for schools (International Baccalaureate; IGCSE), language tests (e.g. TOEFL) and computer skills (ECDL).
- Secondly, **some content is used cross-border even though it has not been intentionally created for that purpose**. Good examples of these are IT vendor qualifications – e.g. Java, Microsoft and Cisco. In addition, many MOOCs attract learners from all over the world, so that traditional national boundaries are being affected.
- Thirdly, **there is evidence of some collaboration and leadership that has stimulated cross-border OER usage** thanks to common goals. In North America, the Common Core State Standards was chosen as a detailed case study for its usefulness as an international example.

Based on the inventory of cross-border initiatives and related literature, the second part of the study discussed the issues that arose. Some of these issues are generic for any cross-border

educational initiatives, whereas others are specific to the issue of OER. They can be grouped in the following 6 areas: financial issues and sustainability; portability; language; accreditation; sectoral traditions and governance; and finally a bundle of general issues that impact all e-learning innovation and development, including teacher training and CPD.

The third part of the report identified the following potential areas for investigation to leverage synergies between cross-border syllabi/curricula and OER in the context of formal education in the EU.

- How might the current key collaborative initiatives be further developed?
- What is the potential for extended collaborative initiatives in particular subjects and content areas, specifically STEM and languages?
- Could there be collaboration between commercial and non-profit actors?
- What are the potential economic benefits of shared OER and cross-border curricula?
- How far could 'seed corn' and bottom-up initiatives be upscaled?
- What potential for transferability do current government-level initiatives have?
- How could informal learning be validated?

In conclusion, the study calls for visionary multi-stakeholder initiatives in the area of cross-border curricula and education that could offer viable collaboration in Open Educational Resources. This would not only benefit individual Member States, but also create an outlook that, in the longer term, might form a pillar of the development of a European connected Digital Single Market, by for example boosting digital skills and learning.

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1. Introduction and brief

The aim of this study was to make an inventory of the existing cases within the context of formal education (school sector, vocational education and higher education) where a curriculum or syllabus is shared across borders (e.g. state, national, linguistic and cultural) and consider in particular the OER aspects, existing or prospective. The study was done for IPTS by Sero Consulting Ltd of Sheffield, England, over the period June-December 2014. It took full advantage of the outputs of the POERUP project *Policies for OER Uptake* (2011-14, part-funded by the EU Lifelong Learning Programme) which reported in October 2014.

1.1 The context for this study

In 2001, the Massachusetts Institute of Technology (MIT), in an unprecedented move, announced its intention to release nearly all the online resources for its courses on the internet for free access.[1] As the number of institutions offering free or open courseware increased, UNESCO organized the 1st Global OER Forum in 2002 where the term Open Educational Resources (OER) was adopted. The term Open Courseware (OCW) also emerged, referring to a free and open digital publication of high quality university-level educational materials that are organized as courses, and include course planning materials, evaluation tools, and thematic content, under an open license, in particular and increasingly a Creative Commons license.

A number of challenges must be overcome to seize the full potential of OER for all educational sectors. From a technological perspective, accessibility, interoperability, reusability, quality and applicability need to be further improved. While standards exist that are meant to facilitate storage, search and retrieval of OER, further technological and legal solutions need to be developed: to improve access; identify and retrieve relevant resources; and increase opportunities for sharing, reuse, adaptation and knowledge exchange.

To improve quality and sustainability of resources, it is crucial to establish social mechanisms and learning communities around OER which contribute to increasing the motivation amongst stakeholders to create, share and evaluate useful content. A number of issues hindering the uptake and reuse of Open Educational Resources in Europe have been identified. One such issue is related to the reuse of existing OER in a new *educational, lingual and national context*, henceforth called *cross-border use of OER* (Vuorikari & Koper, 2009). In previous literature, the following cross-border cases have been identified:

(1) the OER originates in a different country (e.g. Spain) from the user's country (e.g. France) and is in a different language (Spanish) from the user's mother tongue (French);

(2) the OER is in the user's mother tongue (e.g. German), but the user and OER come from different countries, e.g. Austria and Germany; and

(3) the user and the OER come from the same country (e.g. France), but the content is in a different language (e.g. English).

In this study, the term *cross-border use* is extended to any curricula, or syllabi, when it is used in above described situations, including between states in federal countries such as the US or Germany. By *curriculum* we broadly refer to a specifically planned sequence of instruction incorporating (or not) the specific content and resources.

In terms of OER, the situation is sometimes paradoxical: even if many curricula and/or syllabi descriptions are similar in Member States, many produce their own OER in the same topic areas,

[1] http://ocw.mit.edu/index.htm

e.g. Biology (e.g. human body, DNA), Calculus (e.g. differentiation, integration), Physics (e.g. motion, sound and waves). Very little cross-border reuse exists among Member States.

Similarly, in the course of the OEREU study[2] (Open Educational Resources and Practices in Europe) and its scenario-building exercises, the issue of *cross-border reuse of OER* emerged.

To further investigate the issue, this scoping study was undertaken on the potential of shared, cross-border OER and syllabi within the context of formal education in Europe, taking insight also from the US in particular and the non-European world in general.

1.2 The study brief

The study was in three parts. The first (Deliverable 1) involved scoping and classifying cross-border syllabi/curricula initiatives and their drivers (Jeans, Pepler & Bacsich, 2014). It was followed by a detailed case study (Deliverable 2) of the US Common Core State Standards Initiative and its impact on OER (Bristow, 2014). With both these elements brought together in this final report, it discusses the research findings and the issues they raise and identifies potential areas for further investigation on synergies between cross-border syllabi/curricula and OER in the context of formal education in the EU.

The Study Team consisted of:

- Paul Bacsich (Sero), Project Manager, quality assurance, contributions to initiatives and policy recommendations, co-author of Deliverable 3 (this report) and researcher/editor on Deliverable 1.
- Giles Pepler (Sero), lead author of Deliverable 3 and second author on Deliverable 1.
- Nick Jeans (Sero), lead author of Deliverable 1 on the *World Tour of SharedOER*, and co-author of Deliverable 3.
- Sara Frank Bristow (Salient Research and Sero), author of Deliverable 2 on the *Common Core and its impact on OER*, and co-author of Deliverable 3.
- Riina Vuorikari (IPTS), contributor of initiatives and policy issues and co-author of Deliverable 3.

The Team would like to acknowledge the ongoing support from Yves Punie, leader of the IPTS research and policy activities on *ICT for Learning and Skilling*.

[2] http://is.jrc.ec.europa.eu/pages/EAP/OEREU.html

2. Cross-border syllabi/curricula initiatives and the impact of Common Core State Standards on OER

This section reviews the main findings from the first two parts of the study, which were conducted during late summer and autumn 2014. The inventory of initiatives does not claim to be comprehensive but we hope that it is representative of the field.

2.1 Cross-border syllabi/curricula initiatives

According to the inventory, cross-border initiatives can be categorised under three main headings: cross-border curricula and examinations; OER aimed at cross-border use; and information initiatives.

2.1.1 Cross-border curricula and examinations

Based in Europe, there are two major sets of examinations offering cross-border curricula for schools: the **International Baccalaureate**,[3] offering a continuum of education, consisting of four programmes for students aged 3 to 19, and the Cambridge **IGCSE**,[4] now with an additional primary level curriculum framework for each subject. Both the International Baccalaureate and the IGCSE are supported by a number of repositories, offering some free resources on an OER basis; both curricula are in English.

There are a number of internationally recognised language tests: in English the **British Council** offers **IELTS** and **APTIS**,[5] and from the USA comes **TOEFL**.[6] Parallel tests for French language proficiency are provided by **CIEP**[7] and the Europe-based test materials are linked with **CEFR (Common European Framework for Languages)**.[8]

In the ICT field the **European Computer Driving Licence** is offered by the eponymous Foundation.[9] The programmes are vendor-neutral, although there are few supporting OER resources at present. There are three major international suites of programmes offered by vendors: **Java Developer Tutorials and Training**,[10] **Microsoft Learning**,[11] and **Cisco Academy.**[12]

The VET field (Vocational Education and Training, ISCED level 4) is much less well served. **ALISON**[13] is the only large organisation based in Europe offering a broad range of vocational qualifications. In January 2014, they claimed 350,000 ALISON Graduates Worldwide.[14] Outside Europe, a major new initiative **Skills Commons**[15] has recently been launched in the USA and there have been informal moves to interest EU countries in this. In higher education (ISCED 5 and up), the rapid growth of the MOOC movement has greatly increased the range of courses available on a cross-border basis.

[3] http://www.ibo.org
[4] http://www.cie.org.uk/programmes-and-qualifications/cambridge-secondary-2/cambridge-igcse/
[5] http://www.britishcouncil.org/exam
[6] http://www.ets.org/toefl
[7] http://www.ciep.fr
[8] http://www.coe.int/t/dg4/linguistic/cadre1_en.asp
[9] http://www.ecdl.org/programmes/ecdl_icdl
[10] http://www.oracle.com/technetwork/java/index-jsp-135888.html
[11] https://www.microsoft.com/learning/en-gb/default.aspx
[12] http://www.cisco.com/web/learning/netacad/
[13] http://alison.com
[14] http://www.excited.ie/another-string-excited-bow-revealed/
[15] http://www.skillscommons.org

Within Europe, key players include **Iversity**,[16] currently the only MOOC platform to have courses that offer credits through the European Credit Transfer System (ECTS),[17] **European Multiple MOOC Aggregator (EMMA)**,[18] **FutureLearn**,[19] **OpenUpEd**,[20] **Formasup**[21] and **FIED**.[22]

2.1.2 Open Educational Resources aimed at cross-border use

The **Learning Resource Exchange**[23] (LRE) offers almost 130,000 learning resources/assets. Within the LRE, between 2009-2012, nine Ministries of Education or National educational agencies that were nominated to act on their behalf[24], participated in a project to developed criteria for resources that 'travel well'. The term 'travel well' has the same meaning as cross-border use, meaning crossing national, language and curriculum boundaries. The project defined seven criteria for assessing OER's portability across frontiers and curricula[25]. A previous project eCOLOURS[26] (2005-2006) involving Ministries of Education, and also leading educational content developers, addressed the needs to develop cross-border approaches to co-production and localisation.

Some of the government-supported OER portals have now crossed borders – a good example is **KlasCement** which is supported by the Flemish Ministry of Education and Training. The portal is also used in the Netherlands.[27] In the case of KlasCement, after having a number of registrations by Dutch teachers, collaboration was started between KlasCement, Kennisnet[28] and Wikiwijs[29] with the aim of sharing experiences and best practices, but also technical collaboration took place so that all resources in Klascement were accessible in Wikiwijs and vice versa.

Across Europe a number of initiatives provide OER in single subjects, e.g. **EUROCLIO**[30] in History. **Europeana**[31] is an important cultural repository providing OER which can enrich and support a range of curricula.

2.1.3 Cross-border information

Although not providing cross-border curricula or shared OER themselves, there are several initiatives providing information on cross-border accreditation and study opportunities, including **ENIC/NARIC**,[32] **Ploteus**[33] **and Open Education Europa**.[34]

[16] https://iversity.org
[17] http://ec.europa.eu/education/tools/ects_en.htm
[18] http://www.openeducationeuropa.eu/en/project/emma-0
[19] https://www.futurelearn.com
[20] http://www.openuped.eu
[21] http://www.formasup.education.fr
[22] http://www.fied.fr
[23] http://lreforschools.eun.org/
[24] http://eqnet.eun.org/web/guest/about
[25] http://lreforschools.eun.org/web/guest/travel-well
[26] http://ecolours.eun.org/eun.org2/eun/en/about/entry_page.cfm?id_area=1015
[27] http://www.klascement.be; http://www.klascement.eu; http://www.klascement.nl
[28] http://www.kennisnet.nl/
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[30] http://euroclio.eu/new
[31] http://www.europeana.eu/portal/
[32] http://www.enic-naric.net
[33] http://ec.europa.eu/ploteus/
[34] http://www.openeducationeuropa.eu/en/about_this_portal

2.2 The impact of Common Core

2.2.1 Context of the investigation

This case study examined the recent development of Open Educational Resources (OER) and syllabi within the context of the **Common Core State Standards** (CCSS) in the United States. It analysed the impact that these newly introduced (2010) standards have had on the production, reuse and dissemination of OER in a number of states, as well as across state borders. A review of current state-based OER policies and practices was provided, along with an inventory of relevant implementation guides and content repositories. This offered a snapshot of developments as seen in autumn 2014 and thus might exclude initiatives established around or after this date. In constructing it the team examined an array of open and proprietary academic journals, organisational reports, blogs, webinars and other media. Due to the rapidly changing landscape of CCSS planning and implementation, little data that extended beyond the 2012-13 school year had been published at the time of writing; interviews with key contacts at state departments of education and other organisations played a key role in obtaining an accurate portrait of the state of CCSS at the start of School Year 2014-15.

2.2.2 The policy context

It should be noted that the US federal government does not play a direct role in regulating most components of education in its primary and secondary schools, nor in ensuring a uniform set of national standards or curriculum. US law prohibits the federal education department from having any control over state or local districts' academic achievement standards or curriculum. Each of the 50 states bears full responsibility for the education of its children. Most states then devolve further curricular decision-making to the local level, a state of governance described as 'local control'. Depending on the state, responsibility for ensuring a high-quality education may be shifted to regional school boards, city (municipal) school boards, school unions, or in some cases schools themselves (e.g. charter schools).[35] As a result, the nature and quality of education provided across the United States can vary dramatically, not just from state to state, but from district to district (and even school to school).

2.2.3 Drivers for the Common Core State Standards

The Common Core State Standards (CCSS) are designed to ensure that students graduating from high school are prepared to begin two- or four-year postsecondary programmes or enter the workforce. Specifically, the standards identify specific goals for language and literacy, as well as for Mathematics, that students should acquire at each grade level. Importantly for the US context, the initiative was a states-led effort, not a federal one. The CCSS Initiative was first formed in 2009, and the standards for kindergarten through grade 12 (K-12) were made available in 2010. The standards identify specific goals for language and literacy, as well as for Mathematics, that students should acquire at each grade level. As noted on the CCSS web site, the standards focus on core concepts and procedures starting in the early grades, which "gives teachers the time needed to teach them and gives students the time needed to master them".[36]

For kindergarten through grade 8 (K-8), these are grade-by-grade; at high school level, the standards are grouped into bands for grades 9-10 and grades 11-12. Bands are intended to allow schools, districts, and states flexibility in course design.

For English Language Arts (ELA), the K-5 standards include expectations for reading, writing, speaking, listening, and language across a range of subjects. Standards for grades 6-12 are divided

[35] http://www.publiccharters.org/get-the-facts/public-charter-schools/
[36] http://www.corestandards.org/read-the-standards/

into two sections, one for ELA, the other for History/Social Studies, Science, and technical subjects. In Mathematics, the Common Core concentrates on a clear set of mathematical skills and concepts to encourage students to solve real-world problems. High school (grades 9-12) standards are organised by conceptual category, showing the body of knowledge students should acquire in each category to be college- and career- ready, or to pursue advanced study in Mathematics. Accompanying model course descriptions, or *pathways*, are not intended as prescriptive for curriculum or pedagogy.

2.2.4 State of play in 2014 with OER

As of October 2014, 43 US states had voluntarily adopted and were working to implement the Common Core State Standards. Open Educational Resources, which reside primarily (or by some definitions, entirely) online, have emerged as a viable and potentially cost-saving implementation option (CCSSO, 2014), alongside a wide range of proprietary digital textbooks from traditional and newly-formed publishers.[37]

There have been a number of barriers to implementation. Upon embracing the Common Core State Standards, many states have found them difficult to integrate into existing school ecosystems. Using recently procured resources, teachers must learn to teach according to more complex, more prescriptive standards, and schools must adapt their schedules to cross-curricular requirements, as well as grade banding at the higher levels. Federal accountability measures that tie funding to CCSS assessment have also proved thorny. Additionally, school leaders are encountering technological barriers on the route to deployment. Broadband internet capability simply may not be up to the challenges demanded by a fully online curriculum; students educated in face-to-face or blended settings may be unprepared for 100% online examinations; teachers and students may not be adequately computer literate; teachers may even find too few computers in their schools on which to administer required assessments.[38] Apart from the practical barriers listed above, in the political sphere, a steady stream of criticisms of the Common Core State Standards has been levelled in the years since the standards were made available. Among these are several common accusations:

- That CCSS lowers academic standards, as opposed to raising them.
- That CCSS are part and parcel of a nationally mandated – and therefore illegal – curriculum.
- That CCSS were formed by special interests seeking to profit from software, textbook and assessment tool sales.

Prior to autumn 2014, multi-state collaborations specific to OER were not commonly found between US states, though other academic multi-state collaboration vehicles are not unusual. The first major cross-border OER initiative, the **K-12 OER Collaborative**, was launched in November 2014 at the Open Education Conference in Washington, DC.[39] The Collaborative seeks to offer additional choice to local education agencies, reduce expenditures, and offer higher quality digital educational content. Other partnerships focusing on CCSS have generally revolved around the issue of assessment, and take on a range of forms.

The further outlook is potentially encouraging: OER features increasingly prominently among education leaders' decision-making, and its uptake has been encouraged in federal planning tools such as the *National Broadband Plan* (2010), the *National Educational Technology Plan* (2010), the *Digital Textbook Playbook* (2012) and initiatives announced under the *Second Open Government National Action Plan* (2013).

[37] See : https://www.edsurge.com/n/2014-10-20-open-book-test-can-a-cost-saving-measure-also-raise-performance
[38] http://www.edweek.org/media/common_core_assessments_final_8_26_13.pdf
[39] http://openedconference.org/2014/

2.2.5 Issues arising

The case study of the Common Core State Standards in the US raises two sets of hypotheses which are elaborated below, outlining the main lessons learned.

1. The goal is cross-border adoption of common standards, as in the US

Look beyond the public education sphere for partners, funding and thought leadership. Foundations and commercial entities, for example, have been great supporters of the Common Core State Standards Initiative, as have non-profit education organisations.

- Leave it to each state whether it adopts – and how it executes – the common standards.
- Cross-border regulation should make it financially desirable, but not strictly necessary, to adopt the standards.
- Act swiftly, as there may be widespread criticism/backlash. Solicit public feedback swiftly and efficiently through supporting consortia members.
- Ensure adequate technological capability at school/school district/state level if technology is to feature prominently in measuring achievement.
- Prepare states for reform of curricular content, professional development, and assessment systems after introduction of new standards.

2. The goal is to spur development and uptake of OER in particular

- As above, seek funding/guidance from non-governmental entities, e.g. foundations and private partners.
- Look to those states with the most OER experience at the state policy level for sample implementation models.
- Encourage cross-border meetings, partnerships and consortia – states will have many completely different concerns, but will have at least one critical common driver: saving money.
- Take advantage of any/all links to higher education partners.
- Seek out/designate *OER Champions* in each state to lead the way and, hopefully, work together through development/implementation hurdles.

3. Implementing cross-border curricula/syllabi at the European level

This chapter summarises the evidence provided by current initiatives, and identifies and discusses the issues involved, including how they might impact the three main education sectors of schools, VET and higher education.

3.1 Summary of the evidence from current initiatives

There is evidence from some of the developments we have documented that leadership (whether governmental, commercial or non-profit) can play an important role in stimulating cross-border initiatives. This thread runs through most of the issues discussed below.

Firstly, the evidence from the inventory of initiatives shows that **some syllabi (and their content) are used cross-border intentionally**.

This is clearly the case with the International Baccalaureate (IB)[40] and the Cambridge suite of qualifications. The IB has a substantial footprint in the EU: some, or all, of the four IB curricula are offered in all 28 EU Member States.[41] The Diploma programme is the most popular, with 449 offerings, although 138 of these are in the UK and the only other countries with more than 20 schools offering this are Germany (60), Poland (37) and Spain and Sweden (32 in each). The Diploma is recognised for matriculation purposes by 313 universities across the EU, but a third of these are in the UK (105) and elsewhere only Germany (31), Netherlands (26) and France (23) have more than 20. However, the total number of universities accepting the diploma is still only just above 10% of the European total. Examinations are held in English, French and Spanish, and teaching and resources may be in one or even two of 10 languages, depending on the IB School.

The Cambridge IGCSE[42] is the world's most popular international qualification for 14-16 year olds. It is widely recognised by universities and employers across the world, now with over 10,000 schools in over 160 countries around the world offering Cambridge qualifications. It is, however, not possible to discern a broader footprint for IGCSE across the EU than is the case for the IB.

CIE started a primary years' programme in 2004 called Cambridge Primary to affiliate primary schools and provide curriculum support to them. This is the newer of two English language international primary curricula: the more established one is the International Primary Curriculum,[43] now used by more than 250,000 children in 1,600 member schools in 92 countries.

The IB, the Cambridge suite and the International Primary Curriculum are all in English. This raises issues connected with portability and languages (see sections 3.2.2 and 3.2.3 below). However, the ECDL,[44] which is available in all 28 EU Member States, is offered in national languages, though not in minority languages within Member States.

Secondly, **some content is used cross-border even if not intentionally created for that purpose**. Good examples of these are IT vendor qualifications – e.g. Java, Microsoft and Cisco. Many MOOCs attract learners from all over the world and they have hastened the internationalisation of higher education, so that traditional national boundaries are being affected.

[40] http://www.ibo.org
[41] http://www.ibo.org/en/about-the-ib/the-ib-by-country/
[42] http://www.cie.org.uk/programmes-and-qualifications/cambridge-secondary-2/cambridge-igcse/
[43] http://www.greatlearning.com/ipc/
[44] http://www.ecdl.org/index.jsp

An ongoing JRC-IPTS study (MOOCKnowledge[45]) on MOOC learners found that the participants in MOOCs closely follow language alignments of the hosting institute, e.g. the majority of participants in Spanish MOOCs come from Spain or other Spanish-speaking countries outside of the EU (i.e. mainly Central and South America) and that a MOOC offered by a Dutch operator also has attracted participants from Belgium.

Thirdly, **there is evidence of some collaboration and leadership that has stimulated cross-border OER usage** thanks to common goals. Within North America the Common Core State Standards in the USA and the tri-province agreement between British Columbia, Alberta and Saskatchewan are useful examples, though the impact on learning outcomes from both of these is still a matter for debate.

Within Europe over the past decade Germany has demonstrated that a devolved governmental structure need not necessarily be a barrier to shared curricula. Before Germany participated in the international PISA tests[46] in 2000, there had been little interest in international comparisons and benchmarking. The 2000 PISA results shocked the nation and started to reveal a disturbingly uneven (and low) picture of attainment across the different Länder, and even within each Land. This provoked a broad-based reaction across the Länder, with both sides of the political divide and key stakeholders such as the teaching unions coming together to propose a range of national reforms.[47] The federal German government has continued to play a leadership role in the broader e-learning field; the Development Minister has recruited experts from home and abroad for "New technologies as a door opener for sustainable development", focusing on access to knowledge and education, networking and making data and resources".[48]

The Learning Resource Exchange's 'Travel well' work and the Dutch teachers decision to use the Flemish Klascement portal (described in more detail in section 2.1.2 above) are other useful examples of collaboration through leadership.

3.2 Emerging issues

Based on the inventory of cross-border initiatives and related literature, six main areas emerge that are explored below. Some of these issues are generic for any cross-border use of educational initiatives, whereas others are specific to the issue of OER. These areas are the following: financial issues and sustainability; portability; language; accreditation; sectoral traditions and governance; and the bundle of general issues that impact all e-learning innovation and development, including teacher training and CPD.

3.2.1 Educational reforms, financial issues and sustainability

Financial aspects of implementing educational reforms are often the subject of hard debates and diverse points of views. Taking the example of our previous case study on the Common Core State Standards, a US study (Murphy et al., 2012) looked into possible cost savings by states implementing the new standards in Mathematics and English Language Arts. It finds that "(States) could save about $927 million – or spend as much as $8.3 billion – depending on the approaches they choose in three vital areas: curriculum materials, tests, and professional development." In Europe, on the other hand, 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 (Alquézar Sabadie et al., 2014). However there are, as yet, no convincing studies demonstrating whether this

[45] http://is.jrc.ec.europa.eu/pages/EAP/OpenEduMOOC.html
[46] http://www.oecd.org/pisa/
[47] http://www.oecd.org/pisa/pisaproducts/46581323.pdf
[48] News item from *Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung* (BMZ), 23 January 2015

can be substantiated in the European context where the situation between countries and even between different schools in the same country may vary regarding textbook cost per student. According to Key Data in Europe on Education, in the EU-27, staff costs represent an average 70% of annual education expenditure whereas 14% go to purchasing educational material, but also to maintaining buildings and other operational costs (Eurydice, 2012).

However, some recent US studies, largely around CCSS, provide some evidence in this direction (Murphy et al., 2014; Waters, 2013). One study suggest that use of open textbooks could save over 50% of textbook costs without negatively affecting educational outcomes (Wiley et al., 2012b); another finds that students not only see significant savings but also score higher in OER-based courses than in those based on commercial materials.[49] This could represent a partial solution, though it should not be forgotten that educational materials (paper-based and digital) amount to much less than 10% of the overall costs of education.[50]

Despite the potential of OER for reducing the costs of education, there are important debates on the sustainability of OER initiatives (Downes, 2007; Meiszner, 2012). The current reliance on government and institutional funding 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 as a cheaper alternative to textbooks. From a public policy perspective, it is important to understand how to integrate public and non-public funding models to reduce education cost and maximize public investment returns.

Paraphrasing Alquézar Sabadie et al. (2014):

> *OER challenge the traditional business models of the software industry, scientific publishers and the audio visual sector. 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). 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 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.*

3.2.2 Portability: curriculum compatibility

If syllabi and curricula are to operate effectively across borders (whether these are geographical, political, cultural, pedagogic or linguistic) then portability of resources is important. For example, Clements & Pawlowski (2012) found that curriculum compatibility problems were one of the major barriers for teachers to share OER. The LRE addresses the issues of portability through criteria for

[49] http://www.businesswire.com/news/home/20131002005507/en/Fall-Semester-OER-Projects-Lumen-Learning-Yield

[50] A simple calculation based on the reported cost of textbooks (http://www.theatlantic.com/business/archive/2013/01/why-are-college-textbooks-so-absurdly-expensive/266801/) and the out-of-state fee, a proxy for true cost (http://www.topuniversities.com/student-info/student-finance/how-much-does-it-cost-study-us) suggests a figure of just under 3% in the US

resources that 'travel well' across national and cultural borders. The LRE identifies seven criteria for 'travel well' resources and digital learning object quality, with examples for each criterion.[51]

There are significant numbers of listed resources in STEM subjects, especially in Mathematics. With Mathematics as a universal language, this offers a potentially fruitful area for developing shared curricula and resources and side-stepping issues of portability. IT vendor qualifications are also portable. The **Cisco Networking Academy**,[52] **Java Developer Tutorials and Training**[53] and **Microsoft Learning**[54] have already been identified as possible models for future development, provided the interests of these commercial companies can be addressed.

3.2.3 Language issues

The use of a world language – e.g. English, French or Spanish – or a widely-spoken European language such as German – may enable a greater number of learners to make use of OER and syllabi across borders. Within Europe two of the most significant cross-border curricula in the schools sector are currently based in English – the International Baccalaureate and the International Primary Curriculum.

Where languages are shared across national borders in the EU – e.g. Dutch in the Netherlands and Flanders, French in France and Wallonia, or German in Germany and Austria – there are opportunities for collaboration; an active example of this is the Dutch government's contribution to Klascement. This is a good illustration of the role of bottom-up initiatives: the Dutch government's input came from the realisation that many Dutch teachers were making use of the Flemish resources.

As in the case of Mathematics discussed above, where subject matter uses a global 'language' – i.e. easily translatable concepts – there are significant opportunities to develop shared OER. Other STEM subjects provide potentially fertile ground: a useful example is **PhET Interactive Simulations**,[55] a project at the University of Colorado, Boulder, started in 2002, originally to employ technology to improve Physics education, but now expanded to include Chemistry, Biology, Earth Sciences and Mathematics as well. The project simulations have been translated into over 65 different languages, including Spanish, German, Arabic and Chinese.

Minority and lesser-used languages (LUL) may prove a barrier to co-operation within countries, let alone between them. Whilst there are large amounts of OER in English, Spanish and French, the LangOER project[56] reports relatively few in LUL (lesser used languages). There are some examples of multilingual repositories which could facilitate cross-border syllabi for EU citizens whose mother tongue is a LUL: including **HITSA**[57] and **Koolielu**,[58] two Estonian multilingual repositories; **LORO**[59] run by the Open University; and **Language Box**[60] run by University of Southampton. The OER metadata repository of the **Learning Resource Exchange**[61] has already been mentioned and another useful site is UNESCO's **IITE Open Education Resources Gateway**.[62]

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[51] http://lreforschools.eun.org/web/guest/travel-well
[52] http://www.cisco.com/web/learning/netacad/index.html
[53] http://www.oracle.com/technetwork/java/index-jsp-135888.html
[54] https://www.microsoft.com/learning/en-gb/default.aspx
[55] http://en.wikipedia.org/wiki/PhET_Interactive_Simulations
[56] http://www.LangOER.eun.org
[57] http://www.hitsa.ee
[58] http://www.koolielu.ee
[59] http://loro.open.ac.uk
[60] http://languagebox.co.uk
[61] http://www.openeducationeuropa.eu/en/resource/learning-resource-exchange-lre
[62] http://iite.unesco.org/oer_and_digital_pedagogy/oer/gateway/

Across the Atlantic in Mexico, **Temoa**[63] is a repository of material in more than 10 languages maintained by Tecnológico de Monterrey,[64] *and i*n the United States, Language Resource Centres (LRCs) join forces on a unique portal containing OER in several languages, with the **Center for Open Educational Resources & Language Learning (COERLL)**[65] of the University of Texas playing a leading role on OER in the last decade. These examples demonstrate the value of OER from a global perspective and the potential use of international multilingual repositories to support both cross-border curricula and linguistic diversity in Europe.

Within MOOCs, the **EMMA**[66] project takes a deliberately multilingual, multicultural approach to learning by offering inbuilt translation and transcription services for courses hosted on the platform.

3.2.4 Accreditation and recognition of qualifications

The term 'cross-border education' in general refers to the movement of people, programmes, providers, knowledge, ideas, projects and services across national boundaries. In 2005, UNESCO and the OECD describe it as "higher education that takes place in situations where the teacher, student, program, institution/provider or course materials cross national jurisdictional borders. Cross-border education may include higher education by public/private and not-for-profit/for-profit providers." (UNESCO, 2005)

In a recent European study, *Delivering Education across Borders in the European Union* (Brandenburg et al., 2013), the provision of cross-border higher education services in the EU was investigated. The report identified this phenomenon as *provider mobility*, i.e. franchising or validation of higher education programmes and the opening of branch campuses in other countries. The report claims that such practices have been proliferating at a quick pace and identify more than 250 cross-border Higher-Education activities within the EU-27. The study hints that in Europe, the trend still remains "quite scattered and fragmented" and the authors show that cross-border higher education affects only a very small minority of students within the EU. However, the authors estimate that it is on an upward curve. The evidence indicates that we are talking about a global trend which has been taking place over a period of 10 years.

Cross-border education, especially in the field of HE and VET, risks the creation of a jungle of qualifications. The extent to which they are recognised by different institutions and in different countries is also an issue when attempting to develop shared syllabi and curricula – yet it ought also to be an opportunity. The complexity has led to the development of a range of websites and brokerage organisations designed to guide university admissions officers and potential students through the jungle – e.g. **ENIC-NARIC**.[67]

The major initiative to develop a common accreditation framework across Europe over the past ten years has been the **European Qualifications Framework (EQF)**. The main access point for EQF developments is the **Ploteus** portal.[68] Its website asserts that the EQF initiative is closely related to the qualifications framework for the European Higher Education Area: that the two frameworks are compatible and their implementation is coordinated at national and European level. Although there have been calls for the Bologna Process[69] to be re-visited, with a view towards greater recognition

[63] http://www.temoa.info
[64] http://www.itesm.mx/wps/portal?WCM_GLOBAL_CONTEXT
[65] http://www.coerll.utexas.edu/coerll/
[66] http://www.openeducationeuropa.eu/en/project/emma-0
[67] http://www.enic-naric.net
[68] https://ec.europa.eu/ploteus/content/how-does-eqf-work
[69] http://www.ehea.info/Uploads/QF/Bologna_Framework_and_Certification_revised_29_02_08.pdf

of competences (Bacsich, 2014: Recommendation 5), the European higher education framework is better co-ordinated than European VET.

However, progress in developing the EQF has been slower than the planned timetable: by 2012 only 13 Member States had produced referencing reports matching their national qualification frameworks against EQF. Since then, a further five have produced referencing reports (and Iceland as well), but this leaves ten EU Member States which have not done so.

There are also European projects and initiatives to develop and harmonise the recognition of prior learning and informal learning. Many universities, though, retain individual policies and practice and VET qualifications do not yet recognise or put a value on informal learning. Lack of uniformity in recognising prior and/or informal learning remains a significant barrier to the development of shared syllabi. However, progress is being made in several Member States, as noted by Souto-Otero (2013) especially in Chapter 3 and his EU map on page 28. The POERUP project made specific recommendations to advance this area, in HE (Bacsich, 2014: Recommendations 6 and 7) and in VET (Pepler, 2013: Recommendations Group 7).

3.2.5 Sectoral traditions and governance

Across the EU there are wide variations in the extent and nature of central government control over school and VET education and training, from micro-management of expenditure and curricula through to broad institutional autonomy – and sometimes, as in England, an apparently paradoxical mixture of the two extremes – whilst universities maintain a high degree of autonomy, especially private universities. Some of these variations are linked with political and administrative organisation in Member States, whilst others reflect long-standing cultural differences in the nature of management through government.

Whilst overall management of education is undertaken by the Member State in most EU countries, a number have devolved regional administrations whose powers may impact aspects of education and the development of open education practices. The POERUP country reports[70] detail significant examples of a number of individual countries where this is wholly or partially the case, including the UK, Germany, Austria, Spain and Belgium. In Spain the school curriculum is nationally organised, but the 'states' (communidades autónomas) have a number of responsibilities, including school admissions and the allocation of teachers; in Belgium the differences in school systems are relatively small, but they are greater in higher education.[71] However, as noted in section 3.1 above, Germany currently provides a good example of national concerns overriding regional differences.

The situation is similar *within* countries. OECD (2009 reports (p. 39) that:

> *In all but four TALIS countries (Malaysia, Malta, Mexico and Turkey) over 90% of teachers worked in schools with considerable responsibility for choosing the textbooks used in the courses they teach[…]. Fewer teachers in TALIS countries worked in schools whose school principal reported considerable school-level responsibility for determining course content. On average across TALIS countries, 66% of teachers worked in schools which had this responsibility. This was more common in Denmark, Hungary and Italy where over 95% of teachers worked in schools with considerable responsibility in determining the content of courses they teach but is found less frequently in Bulgaria (28%), Malaysia (33%), Mexico (33%) and Turkey (27%).*

[70] http://poerup.referata.com/wiki/Countries
[71] http://poerup.referata.com/wiki/Belgium

Thus whereas the open textbook movement has gained some traction in the US, and in Europe the Poland government is continuing to invest in its *Digital School Programme*,[72] several European countries would find it hard to accept a standard schools' curriculum driven by standardised textbooks.

Universities operate in an increasingly competitive market, both across Europe and globally. In this environment, universities tend to claim their approach is unique and try to differentiate themselves from competitor institutions, and many of the prestigious universities are now selling their products world-wide. There are international MOOC consortia forming: two of the most significant European examples are **FutureLearn**[73] which now has 50 partners and **Iversity**,[74] of potentially significant strategic importance to the wider Germanophone community and mapped into ECTS.[75] This can militate against the development of shared syllabi/curricula, except possibly in first-year curricula and specialist service teaching (e.g. Statistics, Calculus).

Whilst competition and differentiation continue to permeate the HE environment, it is perhaps unsurprising that even in the open universities in Europe there are few current examples of common syllabi/curricula. However, in the STEM area in particular there is a strong case for developing further research as POERUP has recommended (Bacsich, 2014: Recommendation 8) and this is explored in sections 4 and 5 below.

Cross-border curricula and syllabi within the European schools sector have been described earlier in this paper. In addition to those already highlighted, there is the **Matura** or a similar term (*Mature*, *Matur*, *Maturita*, *Maturità*, *Maturität*, Матура), the common name for the high-school exit exam or 'maturity diploma' in various countries, largely, though not exclusively, in eastern and south-eastern Europe. Whilst there are clearly major political issues standing in the way of any harmonisation and cross-border syllabi, there are a number of components which are common to all, or almost all of the countries. Mathematics is compulsory almost throughout (voluntary only in the Czech Republic) and proficiency in the native language is tested in all the countries. Sciences are compulsory in some, but even where they are optional the same STEM subjects appear in the curriculum. Proficiency in a non-native language is a common feature in all countries. In many of them a range of such languages is available.

Whilst the variants of the Matura may not offer a realistic opportunity for the development of common syllabi, the commonalities clearly offer the possibility of developing OER to serve languages, the sciences and Mathematics.

The same is equally true for the Spanish **Bachillerato** and the French **Baccalauréat.** The Bachillerato is common to Spanish-speaking countries – hence widely used in Hispanic America as well as in Spain – although the format may vary and has recently been amended in Spain itself.

Just as there are very few OER in VET, so there are very few examples of common syllabi/curricula, except in the IT vendor area.

3.2.6 General issues impacting e-learning innovation and development

Many of the issues general to all e-learning innovations and development present barriers to the development of shared OER and cross-border syllabi, even though they are not specific to these areas.

[72] http://oermap.org/evidence/digital-school-program-in-poland/
[73] https://www.futurelearn.com
[74] https://iversity.org
[75] http://ec.europa.eu/education/tools/ects_en.htm

Technology infrastructure is one of these: the most recent *Survey of Schools: ICT in Education* (European Schoolnet/University of Liège, 2013) notes that:

> *Policies and action at infrastructure level are still needed to enable the large majority of students, at all grades, to be in highly digitally equipped schools as defined above. These policies, putting the focus on providing laptops (or tablets, netbooks, etc.) and interactive whiteboards, would help to overcome what is still considered by practitioners as the major obstacle to ICT use.*

The same report discusses teacher professional development – a key area in developing the use of OER. European education and training institutions often lack the vision or capacity to promote innovative teaching methods and an integrated use of technologies.

4. Areas for further investigation

This chapter builds on the research of initiatives and overall analysis to outline areas where further investigation might usefully be attempted.

Drawing on our research and analysis, therefore, we suggest seven areas suitable for further investigation:

1. how key current collaborative initiatives might be further developed;
2. exploring the potential for extended collaborative initiatives in particular subject and content areas, specifically STEM and languages;
3. collaboration between commercial and non-profit actors;
4. further research into the potential economic benefits of shared OER and cross-border curricula;
5. exploring the potential for upscaling 'seed corn' and bottom-up initiatives;
6. exploring the transferability of current government-level initiatives;
7. validation of informal learning.

Although each of these areas is discussed separately in the following sub-sections, in reality there are considerable overlaps between some of the separate headings which are indicated in the text. It would be possible to combine some of the potential research areas.

4.1 Building on current collaboration

As noted previously, there are a number of European-wide, national and/or regional initiatives that invest in the creation and re-use of open textbooks and OER, and in the related pedagogical practices (e.g. through teacher professional development). Policy-makers at the European and Member State level could seek to foster more exploratory investigation in the area of common cross-border syllabi and curricula with a clear vision similarly to the *K-12 OER Collaborative* initiative that started in the US in November 2014.

In particular, multi-stakeholder initiatives including national and regional decision-makers as well as professional organisations (e.g. teachers associations; publishers), and public and private content producers could offer potentially viable collaboration, benefiting not only single Member States, but also giving an outlook that, in the longer term, might form a pillar of the development of a European connected digital single market in what comes to cross-border education in the large sense of the term.

4.2 Developing content and subject areas: STEM and languages

The European economic and jobs agenda highlights proficiency in STEM subjects, digital literacy and multilingualism as key factors in growth and prosperity. The possibilities and practicalities of developing shared OER-based curricula in these areas could usefully be further researched.

Of all the STEM subjects Mathematics is the one which could lend itself most effectively to cross-border curricula and sharing OER across the borders. It is, after all, a universal language and although approaches to teaching and learning may vary, the subject matter does not. The right Mathematics knowledge and skills are especially important at the transition stage to higher education, so that students are fully equipped to tackle the first year of undergraduate studies in subjects where Mathematics is either the main course, or an underpinning subject. In terms of potential shared curricula, it would be worth exploring the potential offered by the work of the

Bourbaki Group,[76] which has influenced both the French Mathematics curriculum and the UK's *School Mathematics Project* (SMP).[77]

Another subject area which emerges from the widespread use (and currency) of vendor qualifications is in Computer Science, which is not likely to change from its current importance. This area also offers the possibility of exploring vendor-led common syllabi and curricula. For example, many European countries have recently been moving towards teaching of computer coding in schools, as part of a world-wide movement.[78] More generally, the drive for digital literacy remains important for all age groups and at all levels of education. The **ECDL**[79] is a potential vehicle for this; it is already a cross-border curriculum and the development of a wider range of OER to support it would be beneficial.

In languages there are a number of resources cited by the LangOER study project[80] across Europe. The project is currently investigating the issues surrounding the development of OER in LUL (lesser used languages).

Building on this research, combined with other studies and leveraging on experience from students, it would be valuable to look at the possibilities for shared syllabi/curricula supported by OER resources in language groupings where the languages are (a) either shared across borders or (b) are sufficiently similar to enable access (reading or listening for study purposes) from each country in the linguistic community.

Potential examples of these mostly within EU Member States would include, under category (a), the wider French, Dutch and German-speaking communities; and under category (b) the groups of countries speaking the Continental Scandinavian, Balto-Finnic and Eastern Baltic groups of languages (Sweden/Norway/Denmark; Finland/Estonia; Lithuania/Latvia). There are more such groupings within the wider set of European countries that can take part in the Erasmus+ Programme.

Note that the two groups shade into each other in that language 'ownership' is related to nationhood – for an example adjacent to the EU, the debate as to whether the Moldovan language is or is not identical to the Romanian language (coded **ro** in ISO 639-1) is a political not just a linguistic issue and can be construed differently at different dates and under different political regimes.[81]

Finally, some other professions with strong Europe-wide relevance and some years' worth of existing activities generating a 'European curriculum',[82] such as medicine and nursing, could be areas in which to invest in shared curricula and materials.

[76] http://en.wikipedia.org/wiki/Nicolas_Bourbaki
[77] www.smpmaths.org.uk
[78] See http://csta.acm.org/Curriculum/sub/CurrFiles/CSTA_K-12_CSS.pdf from the US, http://www.computingatschool.org.uk/data/uploads/ComputingCurric.pdf from the UK and http://ascilite.org/conferences/dunedin2014/files/fullpapers/64-Gasson.pdf from New Zealand
[79] http://www.ecdl.com
[80] http://langoer.eun.org
[81] http://en.wikipedia.org/wiki/Moldovan_language and http://en.wikipedia.org/wiki/Romanian_language
[82] In the case of nursing see for example http://www.ccnurca.eu/sites/dbtcg2.acad.kahosl.be/files/deliverables/ANALYSIS%20OF%20CURRENT%20SITUATION%20IN%20EU%20AND%20WB_0.docx

4.3 Collaboration between commercial and non-profit actors

In considering the potential of vendor qualifications to facilitate open education and support shared OER and cross-border curricula it is worth noting that European publishers including Pearson, Bertelsmann and Sanoma already produce a wide variety of online resources, not only in English. Rather than re-running the simplistic 'open textbook' adversarial debate, it might be more fruitful to explore joint ways forward for types of resources other than textbooks in support of learning. It also might be well worth investigating the potential for leveraging vendor qualifications to generate cross-border curricula and OER, again perhaps initially through support material.

4.4 Researching potential economic benefits

Within the open education movement, people need no convincing that there will be benefits to learners through developing cross-border curricula supported by OER. Outside that movement, convincing national governments is another matter. Quite apart from political considerations and any concerns about loss of control, the economic benefits need to be clearly spelt out. This requires two types of actions.

In a climate of continued economic difficulty and a search for best value for money, it is important to find *evidence* for the economic benefits from sharing cross-border syllabi/curricula and open educational resources; however, such curricula and resources will not come about without up-front costs (e.g. curriculum development) and annual recurrent costs (teacher training, materials updating). Possibilities for OER could be manifold, even if the current model of OER production rarely provides *business models* for sustainable OER.

Thus one type of action is to engage in further monitoring of efforts related to 'Open Education' at the regional and national level which could be built into on-going monitoring of ICT indicators within the EU, including cost-savings. In the US, the development of CCSS has generated a number of studies of the potential cost benefits of OER and sharing – these are cited in section 3.2.1 above. But the parallel European studies are not there.

The other type of action is to carry out further research to develop a cost/benefit framework which could be applied in both national and trans-national contexts to business models of OER. There is a considerable amount of work to do here since the subject of cost/benefits of online learning has also neglected in Europe since the start of the millennium, as noted by the report by Bacsich (2008) for the UK agency JISC, and with little progress in the last six years. Any such study needs to be split into sub-studies on HE and schools, which have very different approaches to funding and often different Ministries in charge. Even in HE one has to bear in mind the different funding models across and in some cases within Member States – and between undergraduate and postgraduate studies. Thus such studies are not simple.

4.5 Upscaling 'bottom-up' and 'seed corn' initiatives

The UK North West Consortium[83] is an example where seed funding, initially through the JISC/HEA OER programme, has been sustained beyond the end of project funding 'under the radar' through grassroots activity within the HEIs concerned. There will be other examples of similar bottom-up initiatives which further research could explore, in order to establish the critical success factors for growth of this nature. One potentially important success factor is likely to be the nature of the OER community or communities involved – the work of Schreurs et al. (2014) explores the key success factors within OER communities.

[83] https://www.jcsonlineresources.org/regional-consortia/north-west-england-consortium

4.6 Transferability of existing national government-supported initiatives between countries and regions

Alquézar Sabadie et al (2014) assert that:

> *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.*

One country with a declared set of open education and OER policies is Slovenia. One European region with a similar set of policies is Wales. Slovenia has followed up its initial declaration with a range of projects[84] and Wales has declared its intention to follow up its HE policy initiative in other education sectors. How far might these national initiatives be replicable across the smaller countries in the EU? And those with devolved administrations?

4.7 Validation of informal learning

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. These have been refined by POERUP and more recent studies such as OpenCred.[85] 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. Such schemes could readily operate across borders and the feasibility of this could usefully be further investigated.

[84] http://www.ouslovenia.net

[85] http://is.jrc.ec.europa.eu/pages/OpenCred/ISUNITWEBSITE-IPTS-JRC-EC.htm and https://aisantos.wordpress.com/2015/02/02/opencred-study-assessment-and-recognition-in-open-learning/

5. Concluding remarks

The aim of this study was to make an inventory of the existing cases within the context of formal education (school sector, vocational education and higher education) where a curriculum or syllabus is shared across borders (e.g. state, national, linguistic and cultural). Based on the analysis of the desk research and a case study, further considerations were made for the potential of Open Educational Resources, either existing or prospective.

The study was conducted in three parts. The first involved scoping and classifying cross-border syllabi/curricula initiatives and their drivers. It was followed by a detailed case study of the US Common Core State Standards Initiative and its impact on OER. With both these elements brought together in this final report, the aim was to discuss the research findings and the issues they raise. The report further identified potential areas for investigation to leverage synergies between cross-border syllabi/curricula and OER in the context of formal education in the EU.

The study calls for visionary multi-stakeholder initiatives in the area of cross-border curricula and education that could offer potentially viable collaboration on Open Educational Resources benefiting not only single Member States, but also giving an outlook that, in the longer term, might form a pillar of the development of a European connected digital single market, for example for boosting digital skills and learning.

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