Empowering Student Mobility with OpenCourseWare

A handbook for universities to get the most out of OpenCourseWare to support Student Mobility

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Project

OpenCourseWare in the European Higher Education Context:
how to make use of its full potential for virtual mobility with the support of the Lifelong Learning Programme of the European Union

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- Creative Commons (CC)
- European Association of distance Teaching Universities (EADTU)

Website

http://opencourseware.eu

Education and Culture DG
Lifelong Learning Programme

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Introduction: Empowering student mobility with OCW

The European Union has long supported student mobility through its Erasmus Exchange programme (now Erasmus+).[1] With its Erasmus programme, it has fostered a generation of highly mobile and interculturally savvy students who find it only natural to engage with distant partners in their professional lives. Their open mindset allows them to conceive new products, services and lifestyles that can be shared by many and drive interactions and businesses.

Mobility in programmes such as Erasmus gives students an intercultural experience, in which they need to cope with cultural differences and adapt to local practices. It trains language and interpretation skills, and requires flexibility and an open attitude to learning. And it prepares very well for the emerging economic reality in which many workers become so-called "mobile workers"[2] who work at several locations for the same, or a combination of jobs. In an ever-changing world, mobile workers are ideally flexible professionals who know no boundaries to their goals and ambitions. They are able to think globally, bridge cultures and continents, and act decisively both in the physical and virtual world. They build international networks of competent peers that can give them instant access to the knowledge that they need, when they need it. They speak many languages, not in the least the language of computer coding. In the highly virtual, digital work environment of today, understanding computer coding helps workers convert their ideas into working solutions, as is exemplified in new applications and workflows.

This means the skills acquired in Higher Education must match those required in this mobile environment, and that Higher Education should deliver this education in a way that is less tied to physical location and delivers learning contents to students where and when they need them. In other words, flexible higher education that meets the needs of mobile students needs innovative ways to deliver learning content. And this is precisely where OpenCourseWare comes into play: Open Courses are available online, where they can be consulted from any place, at any time, at any pace. The fact that they are open has some inherent advantages in that it makes them more suitable for answering these needs than courses offered on institutions' online virtual learning environments. For instance, "open" means findable online and accessible to readers from different backgrounds and cultures. This means that a well-conceived open course naturally adapts to many audiences and takes into account cultural barriers. It also means that the content is presented in a modular way, so that the mobile student can exactly find what he or she needs without losing time.

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1   http://ec.europa.eu/education/index_en.htm

2   See e.g. http://mashable.com/2011/08/08/mobile-workers-infographic/, http://arstechnica.com/information-technology/2013/08/how-mobile-technology-created-a-workforce-that-never-stops-working/, http://news.techworld.com/mobile-wireless/3424863/mobile-workers-reach-13-billion-by-2015-report/?olo=rss

Life-Long Learning

While students between the ages of 18 and 25 might constitute the majority at traditional universities[3], this is changing at an increasing pace: Elderly people are also seeking education and Life-Long Learning is becoming the norm. Jobs of the future will require skills and competencies that may not be covered by today's university degrees. Today's young professionals will need to continually update their knowledge, learn new skills and develop new competencies. Higher education is an excellent starting point to give you the skills to learn what you need and when you need it. But it is only the start of a long journey of continual learning.

Today, Life Long learners can be of any age, come from any place, study at any time, and learn at any pace. Learning is also not just an individual experience for the learner. We have become a learning society in which the pursuit of knowledge has become a common goal and a collective undertaking. Open courses are a way to share this common knowledge on the Web. By providing open, in-depth courses with the full texts online, search results become more substantial and yield deeper information. Going from a Wikipedia article to a course where the relations between different concepts are actually introduced and explained in a step-by-step approach is an important, qualitative step when real learning, and not just information sharing is required.

Open for the future

Education is about sharing knowledge. Openness is an important enabler of this knowledge-sharing in the 21th century. It could even be argued that openness is a core competency of the 21st century. Openness involves mutual respect, intercultural understanding, transparency, and above all, a spirit of collaboration and sharing. Openness allows people to rapidly incorporate new ideas and build on one another's knowledge. It allows people to better understand each other and the world around them. It allows for creative collaboration to build a world we cannot yet imagine. Openness is the cornerstone of Open Education, permitting learners and educators around the world to create, share, use, update and revise course materials and other educational resources developed by faculty from around the world. David Wiley's 4 R's of Openness explain the mechanics of this sharing culture[4]:

- *Reuse: the right to reuse the content in its unaltered/verbatim form (e.g., make a backup copy of the content)*

- *Revise: the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)*

- *Remix: the right to combine the original or revised content with other content to create something new (e.g., incorporate the content into a mashup)*

- *Redistribute: the right to share copies of the original content, the revisions, or the remixes with others (e.g., give a copy of the content to a friend)*

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3 See detailed statistics at Eurostat:
   http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Education_statistics#Students_in_tertiary_education

4 David Wiley, Openness as Catalyst for an Educational Reformation, EDUCAUSE Review, vol. 45, no. 4 (July/August 2010): 14–20. http://www.educause.edu/ero/article/openness-catalyst-educational-reformation

Using this handbook

With this handbook, our aim is to show how students, teachers and universities throughout Europe can get the most out of OpenCourseWare to participate in new learning communities and facilitate virtual exchanges across borders.

This handbook is one of the results of a European education project funded by the Lifelong Learning Programme of the European Union entitled "OpenCourseWare in the European HE context: How to make use of its full potential for virtual mobility". More information about the project can be found at www.opencourseware.eu/background. The focus of this project is to lay the foundations for a strong European OpenCourseWare framework. A stronger framework also means closer cooperation between European institutes, which results in the mutual use of material and even joint degrees. A better functioning OpenCourseWare system will enhance quality and increase the usage of online courses while facilitating virtual mobility through increased co-operation and the removal of barriers to higher education. A virtual mobility experience can be a valid alternative for the many students who cannot travel for studies abroad for financial reasons.

This handbook offers a number of resources, guidelines and scenarios to increase the use of open educational resources for student mobility in European Higher Education. In the first chapter, we define a number of frequently used terms, such as Open Educational Resources, OpenCourseWare or (Virtual) Student Mobility, and outline the context of student mobility, both physical and virtual. In the second chapter, we offer a number of scenarios for the use of OpenCourseWare both in the context of on-campus education and that of (virtual) student mobility. This handbook ends with a description of current (and future) trends in Open Education.

I.   Open Education and Student Mobility

A.   OPEN EDUCATION, OPEN EDUCATIONAL RESOURCES AND OPENCOURSEWARE

OpenCourseWare is the umbrella term for open educational resources presented in a course format, often including course planning materials such as syllabi and course calendars, along with thematic content such as textbooks, lectures, presentations, notes and simulations. Open Educational Resources are materials developed by experienced educators available for use, repurposing and modification (including translation) in whole or in part by everyone, everywhere around the world.

Open Education[5] is, at its core, about free and open sharing. "Free" meaning at no cost and "open" referring to the use of legal tools (open licenses) that give everyone permission to reuse and modify educational resources. Free and open sharing increases access to education and knowledge for anyone anywhere at any time. It allows people to make changes to materials or to combine resources in novel ways to build something new. Open Education integrates free and open learning communities, educational networks, teaching and learning materials, open textbooks, open data, open scholarships and more. Open Education gives people access to knowledge, provides sharing platforms, enables innovation, and connects communities of learners and educators around the world.

The idea of free and open sharing in education is not new. In fact, sharing is probably the most basic characteristic of education: education is sharing knowledge, insights and information with others, upon which new knowledge, skills, ideas and understanding can be built. Open Education seeks to scale educational opportunities by taking advantage of the power of the internet, allowing rapid and essentially free dissemination, and enabling people around the world to access knowledge, to connect and to collaborate. Open is key; open means not just access, but also the ability to modify and use materials, information and networks so that education can be tailoured to individual users, or woven together in new ways for large and diverse audiences.

B.   (VIRTUAL) STUDENT MOBILITY

The Education and Training division of the European Commission broadly defines mobility as "spending a period of time in another Member State in order to undertake study, work experience, other learning or teaching activity or related administrative activity, supported as appropriate by preparatory or refresher courses in the host language or working language" (European Commission, 2008). Hence, we use the term Student Mobility to mean 'spending a period at another Higher Education Institute to undertake a study'.

One particular form of student mobility is Virtual Student Mobility, in which a student does interact with institutions, teachers or students abroad and this with the explicit aim to learn, but without necessarily moving abroad physically. The Education and Training division of the European Commission defines Virtual Mobility as:

> *"As a complement or as a substitute to physical mobility (Erasmus or similar) in addition to a type of independent mobility which builds on the specific potentials of on-line learning and network communication. It may prepare and extend physical mobility, and/or offer new opportunities for students/academic staff who are unwilling or unable to take advantage of physical mobility. (…)*

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5   http://www.oeconsortium.org/about-oec/

> *Full academic recognition is given to the students for studies and courses based on agreements for the evaluation, validation and recognition of acquired competences via Virtual Mobility.*
>
> *In this context, cooperation agreements are key to ensuring sustainable mobility schemes."* (European Commission, 2008)

In the light of Open Education and Online Learning one could say that using any OpenCourseWare of a Higher Education Institute in a country that is not your own is a form of Virtual Student Mobility induced and enhanced by the existence of initiatives such as OpenCourseWare.

A more recent and more limited definition of Virtual Mobility can be found in De Gruyter e.a. (2011), in which it is described as "the set of ICT supported activities that realise or facilitate international, collaborative experiences in a context of teaching and/or learning" (p.19). They additionally describe several of the components of this definition. The most important concepts are further expanded on below. As the authors state, the term 'activities' is chosen because of its versatility. After all, Virtual Mobility can refer to learning, teaching and research, and not just at the level of individuals (faculty and students), but also at the level of the organisation. In the light of Open Education and Online Learning, one could say that taking an Open Online Course at a Higher Education Institute of a country that is not your own offers one example of an 'activity' clearly supported by ICT and realising an international experience, induced and enhanced by OCW.

The way in which 'ICT' supports these activities can be twofold: fully when all activities take place digitally and thus from a distance, or partially when ICT supports a physical activity. Blended mobility then refers to a mix of both physical and Virtual Mobility. In this mix, the instructional design benefits of the advantages of both types of mobility. ICT is mostly used to support communication and collaboration, and such interaction can be either synchronous (occurring at the same time), or asynchronous (when the interaction takes place at a different time). OCW is mostly an example of the latter kind of interaction. Without student mobility, a student follows a class at the same time and place as the class is taught, whereas in the case of OCW a course participant watches a web lecture or video at a different time and location then when and where it was originally recorded. In the case of Open Courses, universities support the ICT systems used to achieve this digital communication or collaboration. Universities can choose to connect their OCW with their closed learning environments, but most universities appear to disconnect both.

Achten e.a. (2011) describe a taxonomy of several types of Virtual Mobility in their report. In our view, OCW can be seen as a form of Virtual Mobility of the third type, e.g. Virtual Mobility Related to an International Curriculum. In this type, Virtual Mobility serves as "a scenario to internationalize a (part of a) course (i.e. chapter, exercise, task, project, …) a programme, a workshop, a seminar, … This category can be either fully virtual or blended" (Achten, Op De Beeck, & Van Petegem, 2011, p.21). Students who take an Open and Online Course abroad extend their 'national' curriculum and hence their national learning experiences with international courses or educational resources.

As a concluding remark about the distinction between virtual and physical mobility, it is obvious that both forms have their own characteristics when it comes to motives, efficiency, efficacy, quality, forms of the learning process etc., and that each form moreover facilitates the acquisition of different competencies and skills. As Achten, Op de Beeck and Van Petegem (2011) state: "neither one can fully replace the other, neither one can be considered "second best" (Achten, e.a., 2011, p.114).

C.   INTERCULTURAL COMPETENCE DEVELOPMENT AS AN ADDED VALUE OF VIRTUAL MOBILITY

Van Petegem (2011) describes the added value of Virtual Mobility in terms of the development of students' intercultural competency, which is "a set of cognitive, behavioral and affective/motivational components that enable individuals to adapt effectively in intercultural environments and to successfully communicate with people of other cultures. It is about the ability to understand and respond to cultural differences in increasingly sophisticated ways." (Van Petegem, 2011, p.23). A small remark: the relationship between OCW as operationalisation of Virtual Mobility on the one hand, and the development of students' intercultural competency on the other hand, can also be seen the other way round. A course participant indeed has to possess a certain level of intercultural competency to be able to understand the interpretations of and the way in which content is used in the Open Courses.

D.   ERASMUS FOR ALL: THE EUROPEAN CONTEXT OF "MOBILITY IN SPACE"

The "Erasmus For All" programme of the European Commission is particularly interesting, since it forms the basis of our project "OpenCourseWare in the European HE context: how to make use of its full potential for Virtual Mobility"[6]. It is this project's ambition to contribute to a better functioning and stronger European OCW framework that will (1) encourage cooperation between European HEI, (2) improve quality of education, (3) increase the usage of online courses and (4) this way facilitate Virtual Mobility by strengthening its potential or by removing barriers to students' participation in Mobility. Hence, we try to contribute to the Erasmus For All Programme. After all, the Bologna Declaration stated in 1999 that by 2020 at least 20% of all graduates from the European Higher Education Area should have spent a period of time abroad for either study or training (European Commission, 1999). It is the Commission's opinion that Student Mobility can be leverage for the development level of a country by raising the number of higher-educated people.

It is important to emphasise that it is not our opinion that OpenCourseWare should replace actual mobility, nor are we arguing that virtually mobile students should be included in the 20% figure of mobile students aspired to for 2020. We do however think that the use of OCW as a form of Virtual Mobility can increase people's enthusiasm for actual mobility (either as a student or as a teacher), or at least remove the barriers to studying abroad. We further elaborate on this in Chapter 2, where we outline several possible scenarios for the use of OpenCourseWare in different study phases.

E.   MOBILITY IN TIME

From the above, it becomes obvious that OCW can have added value in Virtual Mobility in space: one can experience learning at another institute without physical travel. Virtual Mobility can, however, also be considered in temporal terms. This can be seen in two ways.

First of all when using OCW, one is not bound to the moments when a professor teaches: a student is free to take the course whenever he has time to do so. We called this asynchronous learning.

Another way of seeing Mobility in temporal terms is the place that learning takes in the career or lifetime of someone who wants to learn. In its surveys[7], the OCW Consortium found that OCW not only targets students actually enrolled at universities, colleges or other educational institutions, but also – and maybe even more so – employees or retirees in search of courses and forms of e-learning in which they are not limited to the hours when classes are taught and when professors are available. In the second chapter of this handbook (scenarios for the use of OCW), we describe several ways in which OCW can be used at any point in a

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6   See http://www.opencourseware.eu

7   http://www.oeconsortium.org/projects/surveyresults/

career.

F.   FORMAL, NON-FORMAL AND INFORMAL LEARNING

In (adult) education and in the context of Lifelong Learning, a distinction is often made between formal, non-formal and informal learning. Again, we refer to the European Commission (2001) to define these three concepts:

> *Formal learning: learning typically provided by an education or training institution, structured (in terms of learning objectives, learning time or learning support) and leading to certification. Formal learning is intentional from the learner's perspective.*

> *Non-formal learning: learning that is not provided by an education or training institution and typically does not lead to certification. It is, however, structured (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's perspective.*

> *Informal learning: learning resulting from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases it is non-intentional (or "incidental"/ random) (European Commission, 2001, p32-33).*

The above definitions make it difficult to classify OCW: the OCW User Feedback Report by the OpenCourseWare Consortium (survey conducted between 2011 and 2013) shows that more OCW users report learning through OCW in an informal context out of their own personal interest (54%), or to update their knowledge and skills for professional reasons (51%). On the other hand, OCW is almost always offered and provided by a formal learning institution (e.g. colleges and universities). Additionally, 44% of the users report it as helping them to understand concepts they are studying, a number that is also rather large. As McGivney states: "It is difficult to make a clear distinction between formal and informal learning as there is often a crossover between the two" (McGivney, 1999, p.1). Moreover, in most cases no certificate is offered upon completion of Open Courses, and Open Courses are often structured in terms of learning objectives, learning time or learning support.

Apart from classifying OCW one way or another, it should be emphasised that OCW can bridge the gap between formal and non-formal learning in at least two ways. On the one hand, students are able to use OCW as non-formal education in addition to their formal education to for instance better understand the contents they are studying in the formal learning situation. On the other hand, OCW users might find it easier to enrol for formal education, while being better informed through the open courses.

II. Scenarios for the Use of OpenCourseWare

The added value of OCW can be described both in the context of On-Campus Education and in the context of Student Mobility, whether physical or virtual. In the first part of this chapter, we describe a number of possible scenarios to use OCW in the first situation. The second part discusses OCW in the latter context in detail.

A. THE USE OF OPENCOURSEWARE IN THE CONTEXT OF ON-CAMPUS EDUCATION

We use the term On-Campus Education (OCE) to refer to education in which students attend on-campus classes and in which technology might support the learning, but does not replace the face-to-face interaction between students and teachers, and between students among themselves. The added value of OCW can in particular be described in terms of student support by offering information, additional and complementary content, and ways in which students 'communicate' with the educational resources.

The first scenario presents itself when students encounter courses with a low pass rate, the so-called stumble courses. When video recordings are made available, students can revisit difficult lectures at their own pace. The open course could offer extra exercises (including the answer keys), or other forms of study support. Knowledge clips, in which small and specific parts of a course are explained in a video of ten minutes at most, can be a major tool for students struggling with certain subjects. Finally, web lectures can be a solution for students with overlapping course schedules.

OCW can offer further added value in the development of a personal learning environment (PLE). Open courses can be modified and revised versions can be made. These student editions can contain extra information from library or online searches. Students can exchange and gather this extra information and reshape the entire course into a "student edition".

Furthermore, students can take courses that are not part of their curriculum using OCW. This not only applies to highly motivated students who simply want to learn more than what is being offered. It is also true for students who want to transfer to another programme and who have to take remedial courses in order to have sufficient prior knowledge or competences to start their new studies or subjects.

Another evolution that universities should take into account is that more and more students with special needs find their way to universities[8]. Several technological solutions can be helpful to limit the impact of their disability, such as transcripts or subtitles in web lectures. Students with language difficulties (e.g. students from a foreign background) can also benefit from this. This does not necessarily need to be set up by the teachers themselves; crowd-sourced language (and other) support can be an "open" solution: students translate courses and course materials and share them among each other. Good practices can be found in the MIT OCW[9] that was translated into several languages worldwide, for example the OOPS project (Opensource Opencourseware Prototype System)[10].

A good example of how students can benefit from OCW during their university studies is the website of the Japanese Studies department at the University of Leuven, Belgium[11]. This online community offers support to Bachelor's and Master's students on various levels: faculty add news and blog posts; there are answers to frequently asked questions (also of the practical kind, such as 'where can I buy my study books?'); students can participate in working groups around several themes; there are links to interesting Open Educational

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8   http://unesdoc.unesco.org/images/0022/002256/225660e.pdf

9   http://ocw.mit.edu

10 http://www.irrodl.org/index.php/irrodl/article/view/463/980

11 http://japanologie.arts.kuleuven.be/

Resources; both students and alumni can participate in Wikispaces on a wealth of subjects, etc. … In short, they have a fully operational learning space where target groups can interact and support each other.

B.   THE USE OF OPENCOURSEWARE IN THE CONTEXT OF (VIRTUAL) STUDENT MOBILITY

We opted to describe the scenarios in the context of Student Mobility in the form of a Student Mobility Cycle: the process of being mobile as a student can be divided into five different phases, depicted in the figure below.
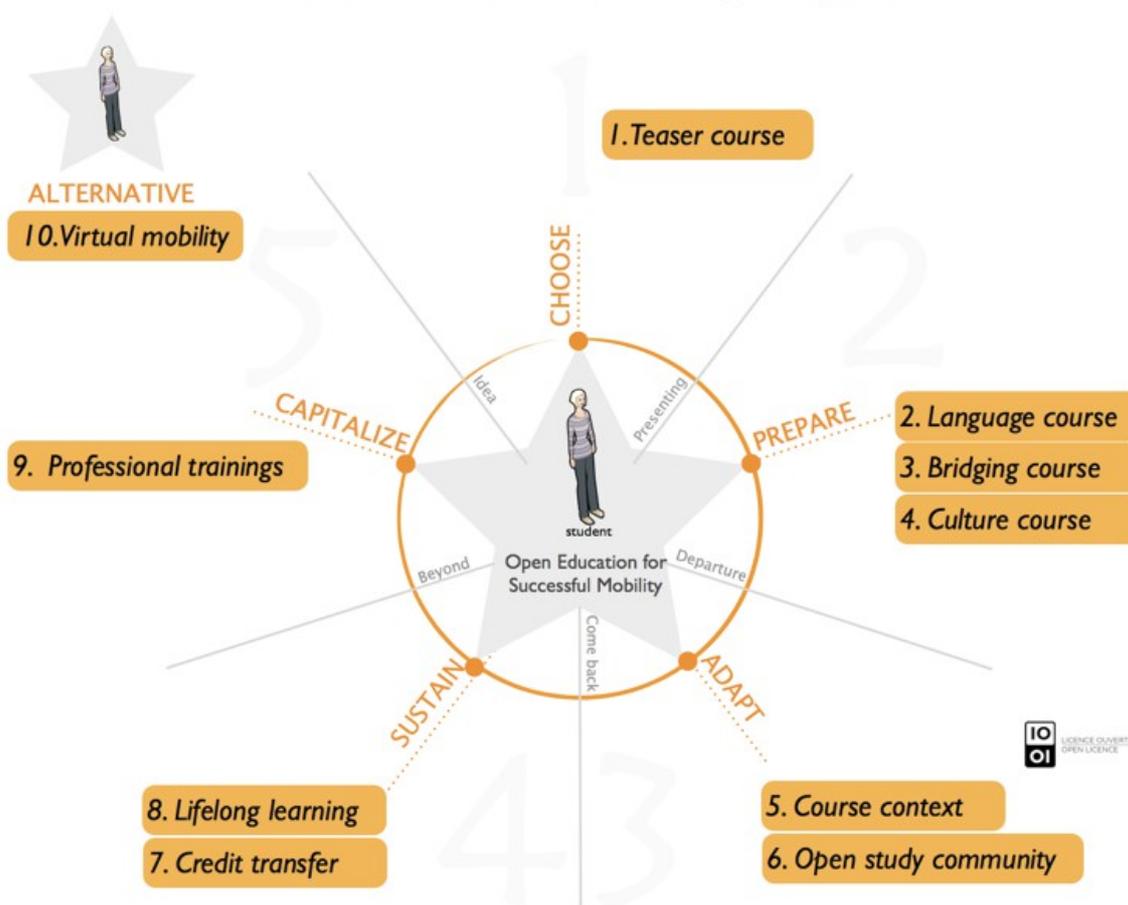
The first phase involves study selection. In this phase, prospective students gather information about their potential future studies in order to choose a study programme. Taking an Open Course from different universities as a teaser course can be invaluable to form a better perspective/understanding of what particular institutions are offering.

Once a student has chosen his course of study, he can start preparing for this course, e.g. by taking Open Courses to learn a foreign language, to gain insight into the learning culture of the institution (certain conventions particular to the institution), or he can use an Open Course to fill what we call his 'knowledge gap'. A lack of knowledge in specific areas can be bridged through Open Courses.

In the next stage, the actual study phase, OpenCourseWare can be used as an extra learning resource: learning materials provided by the teachers of the courses students are taking can be complemented with Open Educational Resources and OpenCourseWare from other Higher Education institutions. This helps the student to adapt to the context he finds himself in.

The fourth phase is the phase in which students want their learning efforts to be validated, e.g. in the form of credits. A student wants to keep updating the knowledge and/or skills he acquired in a particular study programme using OpenCourseWare, whether from a university where he took the course or not. We call this fourth phase the sustaining phase.

This Lifelong Learning scenario, in our opinion, is to be distinguished from professional trainings in the capitalising phase. Lifelong Learning happens when one perceives a learning need and is based on intrinsic motivation. Professional training however is typically requested by the company someone works for. A separate phase, which does not chronologically follow on the five previously described phases, is a possible alternative for students who cannot travel abroad for different reasons. Virtual student mobility is a well-known alternative for actual student mobility, meaning that students can take (open) online courses as part of their curriculum without physically travelling to another institution. It goes without saying that in this case too OpenCourseWare can be a valuable alternative.

Every phase consists of several scenarios. The orange blocks next to the text contain the names of each of the scenarios to provide a visual link to the cycle above.

Phase 1: Choose

Teaser Course

Before going to university[12], a decision has to be made on the appropriate course of study. In this decision process several questions might arise, such as "What is it like to take classes at a university?"; "What is it like to follow a class with 300 rather than 20 other students?"; "What do scientific articles and reading assignments look like, and will I be able to understand them?" Using OCW and its educational materials could be useful to provide prospective students with information about a new study programme they might be uncertain about. Such materials can help prospective students understand the real complexity level of the content or the way a course is organised before they officially enrol.

Both deciding on the appropriate course of study and choosing an appropriate institution normally involves comparing several higher education institutions. When those institutions

offer OCW, a student can assess the types of materials offered and this way increase his confidence with regard to pursuing studies outside his usual environment.

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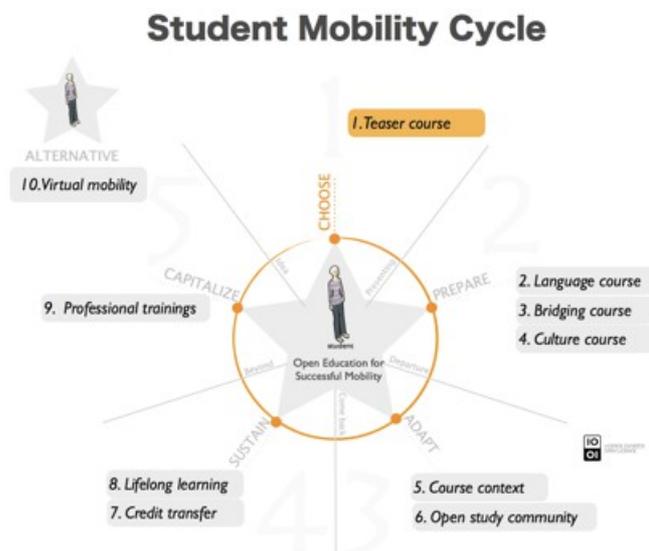
12 When mentioning 'university', we also mean 'college'.

Phase 2: Prepare

Once a student has chosen the university he wants to attend and the study programme he wants to commence, he has to start preparing for that particular course of study. Several problems can arise, such as the need to learn the language of the destination, or experience of a knowledge gap. Both scenarios are described below.

Bridging Course

OCW can fill a 'knowledge gap'. There might be a difference between the curriculums of the home university and the destination university. When a student is not allowed to take a certain course in the programme that he should have completed to be able to take an advanced course at the university abroad, he can independently take the open course to fill the knowledge gap. This is particularly interesting when the study abroad concerns a doctoral study programme, e.g. when someone wants to update or broaden their knowledge of statistics to conduct their PhD research. In addition to filling the knowledge gap, OCW can also be a solution when doctoral researchers fail to attend certain classes because they are combining several tasks. PhD candidates often work as assistants to professors at universities, or combine their jobs with doctoral studies.


Student Mobility Cycle

Language Course

An Open Course of the destination university can be used to assess the language requirements to study at a particular institution. Using the openly available resources might provide answers to questions such as: "Will my language level be sufficient to understand the lecturers?"; "Will I be able to study a scientific text in a foreign language?" If it becomes evident that the student's language skills are indeed insufficient, he can take an open language course to improve his knowledge skills. When a student prepares to study abroad, he could use OCW to acquire communication skills in the required language and to meet the admissions conditions of the destination university.

Culture Course

An open language course can also facilitate integration into the destination's academic and cultural world. After all, language courses often offer a lot of cultural background information on the countries where that language is spoken.

In short, OCW can encourage students to complete (virtual) mobility periods outside of their country of origin because it introduces them to the new institution and it can lift the emotional barriers born when planning a move to a place with a different culture and possibly a different language.
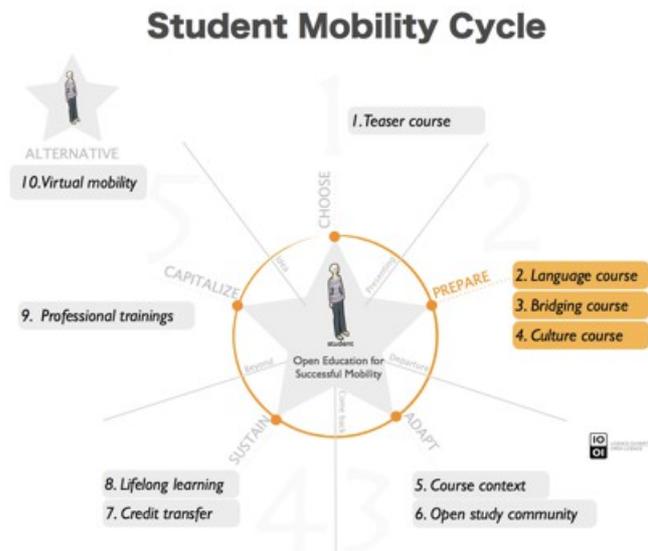
Phase 3: Adapt

Course Context

In taking courses at the destination university, a student may often stumble on references to other locally taught courses that local students might have taken but that are not directly accessible to him. These are contextual elements that are important for correct understanding of the course contents and that need to be clarified. Good OCW is designed so that it makes explicit when an open course builds on other materials and ideally refers to other open content to resolve these requirements for understanding. More broadly speaking, courses are also always embedded in cultural practices and unspoken local conventions part of the local learning community. A university might consider offering courses specifically designed to explain and make explicit these kinds of cultural assumptions that often prove a frequent hurdle for foreign students. An 'introduction to our campus life' open course makes just as much sense as a course on local educational terminology.
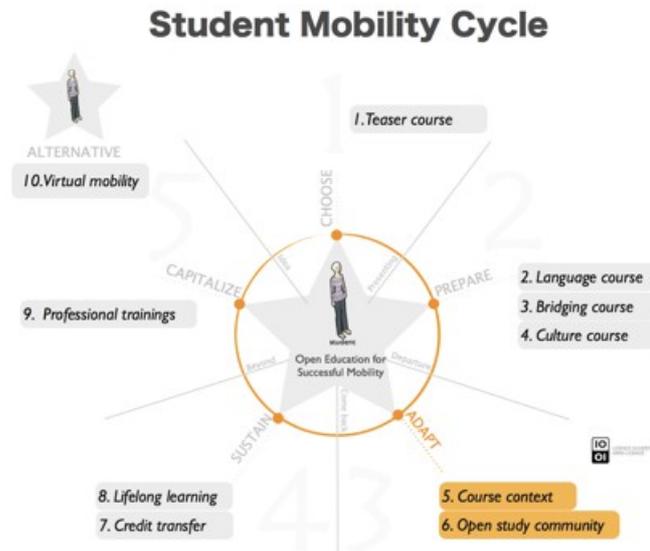
Open Study Community

By joining open online learning communities, the student can organise interactions with local students in direct relation to the course content, e.g. by getting information from local senior students. This partly compensates for the disadvantage of not having a real social network in place from the start. But, conversely, the student can remain active in the social network of his own home university by taking part in open online communities of his home university's online education offer. In general, a true open course should also be a course in which students have the possibility of adding content to the course and sharing this among each other. The main message is that study of an open course reaches its full potential when the student actually becomes part of a social learning network or open study community related to that course. Such a learning community can go beyond students and teachers to also include external stakeholders who might have a relation with the field of study.

The added value of an Open Community over membership-driven communities of practice is that the student typically does not yet have any formal responsibilities towards the field of study and should be able to freely explore this knowledge space without having to take up responsibilities and commitments he is not prepared to assume. The experimental status of the learning experience is pedagogically fundamental.

Phase 4: Sustain

Credit Transfer

Open educational resources, open courses and open information about course metadata in the form of completion certificates, badges, credits and credit transfers, can help facilitate course certification for the student. Exemption for Accredited Prior Learning (APL) can more easily be accorded when study materials and student activities are publicly available as OERs online.

Lifelong Learning

When a student graduates and becomes active on the labour market, his knowledge will need to stay up to date. When the course(s) he took are Openly available, an opportunity exists to have access to new and relevant content related to the courses, and to read and learn about state-of-the-art research results in their field.

Moreover, he can in turn complement the course with practical knowledge and insights gained working in the field of the Open Course. A real Open Community can be constructed.

Phase 5: Capitalise

Professional trainings

Professional trainings are in a certain respect also a form of Lifelong Learning. We opted to distinguish between both in the sense that Lifelong Learning springs from an individual's personal motivation. One continues to learn because they want to, because they feel a certain learning need, and because they truly want to gain certain knowledge or skills. Professional trainings, on the other hand, are often required by but also provided by the company someone works for. Companies often organise internal trainings for certain groups of employees to teach them new skills, or to update them on the procedures common in the organisation. These professional trainings are usually closed to anyone outside the organisation. Moreover, they are often not accessible to employees in that particular company who do not belong to the specific target group the training was developed for. We believe that when these trainings are made accessible to all employees in a company, and even to outsiders, an extra target group might be served, namely the unemployed who can use the content of these trainings to increase their job opportunities on the labour market.

The second issue at hand is the fact that a discrepancy exists between the kinds of skills companies expect in employees and what they actually get when people start working for them. When companies open up their training materials, they can prominently showcase their needs and requirements. This can easily be linked to the teaser courses as described in Phase 1 of this Student Mobility Cycle. Having access to training materials beforehand can help graduates to (1) form a perspective of what the employer wants, (2) to better prepare for their prospective roles and (3) to possibly even be more successful during the job application process.

Virtual Mobility as an alternative for physical Student Mobility

Virtual Mobility

Since not everyone has the possibility or wish to travel abroad, students can opt to be virtually mobile. Virtual Mobility is defined by the European Commission as "a complement or as a substitute to physical mobility (Erasmus or similar) in addition to a type of independent mobility which builds on the specific potentials of on-line learning and network communication. It may prepare and extend physical mobility, and/or offer new opportunities for students/academic staff who are unwilling or unable to take advantage of physical mobility. (…) Full academic recognition is given to the students for studies and courses based on agreements for the evaluation, validation and recognition of acquired competences via Virtual Mobility. In this context, cooperation agreements are key to ensuring sustainable mobility schemes."[13]

Student Mobility Cycle
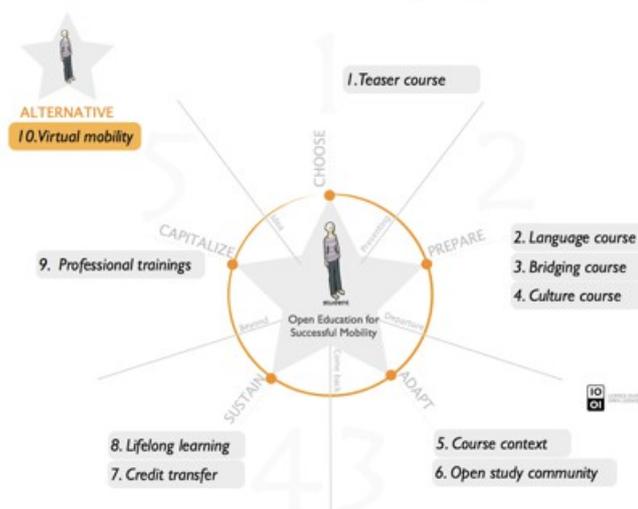
In the light of this definition, it becomes clear that a virtual equivalent exists for several of the above-described scenarios. It all boils down to students taking (open and online) courses from universities other than their own institutions, with the goal of an international study experience and with the intention of including that course in their study programme at their home universities.

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13 http://eacea.ec.europa.eu/static/en/elearning/call-2006/Long_eLearning_2006.doc

III. Recent and future trends in Open Education

Rich Content and Rich Use

We are witnessing an era in which growing interconnection through the all-pervasive Internet is fundamentally changing knowledge and learning. In the "knowledge economy", knowledge itself is what we are industrially producing, distributing, selling and consuming. It has become the premier product of human activity, and information is its raw material. The entire economy is revising its processes so as to foster, produce, distribute, recollect, reuse and remix knowledge in an ever-expanding upward spiral.

While in epistemology current thinkers have understood that knowledge is radically social, maybe the most stunning thing we have come to realise is that the locus of knowledge has shifted away from the individual to the community, the organisation, the industry itself. We are surrounded by knowledge organisations, which develop insights that exceed the reach of the individual level.

This is maybe one of the most underestimated effects of OpenCourseWare. It offered one of the foundations for precisely this: even advanced scientific knowledge should be uploaded to the Internet. It is something we will co-develop in the Internet space from now on. Sharing Open courses on the Web not only means sharing between individuals over the Internet, but also sharing with the Internet itself.

Two opposite developments are taking place: on the one hand, we are making content in a way that it is maximally shareable, so that it is absorbed into this vast knowledge space that is the Internet and that is gradually becoming our shared intellect. Very advanced information architectures are required for this so that the "semantic Web" can be built, in which robots, search engines and applications are capable of detecting relations between information. This is what we call "Rich Content". On the other hand, there is the "Rich Use", i.e. the fact that many stakeholders interact with the content on this semantic Web. This is the social Web as we know it, where social media have had a transformational influence.

Specifically for OpenCourseWare, this means content has to be structured in such a way that it meets this machine-demand for maximal automation and cross-application usability. We will see a shift from HTML-based course pages to database -driven, XML-based courseware that adapts to a myriad of online, responsive delivery formats. On the other hand, we will see more and more Open Courses not just put online as such, but tailored to very specific target user groups, embedded in communities of practice.

Linked data are the tissue of the new generation Web and the building blocks of the Resource Description Framework. This is the technology that librarians use to make the Web a more meaningful place, where an application can understand that an "author X wrote book Y" relationship exists between a mentioned author and a book title. Gradually, linked data will yield much more reliable and specific search results. Universities should invest in acquiring, implementing and developing linked data production methods as the backbone of their open course content, so that students benefit from the higher integration of course contents, search results and background information on the Web. Closed, institutionally locked-in courses will not be able to compete in effectiveness with these highly integrated and networked open contents.

Life Long Learning

As a current and a major future trend, we will have to understand all learning in the perspective of Life Long learning. Academic education focuses on those competencies that allow a student to take control of his learning, to set his/her own learning goals and to adapt to ever-changing knowledge requirements by taking the right learning steps.

While the demand for Higher Education is soaring in BRIC countries[14], regions with more established higher education systems are witnessing a transformation towards a continued support of the learning activities of

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14 http://en.wikipedia.org/wiki/BRIC

their graduates, offering follow-on courses throughout their careers.

Governments, who employ large numbers of civil servants, and companies both small and large, all feel a pressing need for the continued education of their workforce. This puts extra strain on higher education institutions that are already seeing an increased influx in their regular programmes. One of the main reasons why traditional universities, after having been wary of online education for decades, have so swiftly embraced MOOCs[15] is that they see it as an excellent tool to meet the demands of new, emerging markets in the Life Long Learning sphere. Here, the advantages of OpenCourseWare are numerous. One of the key advantages of the classic OpenCourseWare concept is that the course materials are open and indexable on the net, and this way can easily be found rather than pushed. To give one example, a trained nurse who specialises in ambulant services for elderly people at home might develop an interest to deepen his/her knowledge of physiotherapy. While he/she might have previously received formal training on this topic, this was very likely not really focused on the current job environment and might be in dire need of refreshing. While this is a very specific target group, the chances are slim that a formal refresher course is offered, or even that a MOOC is developed for precisely this group. Online materials made available as OCW courses or OER can be discovered, independently of the learning institution, by those who need them.

This serendipity is a very important added value of OpenCourseWare. It allows for unexpected users to discover course contents, and to reuse and repurpose them in their own professional context. Together with a radical OpenCourseWare policy, Higher Education Institutions should focus on teaching the skills that allow students to gain autonomous and continued learning proficiency. These "skills of the 21st century" are together the core competencies needed to become a flexible and mobile knowledge worker.

PLE

Another current, rapidly expanding trend is the so-called "Personal Learning Environment". The idea is that traditional VLEs[16] are too supply-driven and tend to underestimate the student's perspective[17]. Through a smart use of a full range of free, open-source web tools and apps, a student can learn how to organise his or her own learning by creating a personalised learning environment that connects everything – by linking course materials to notes and recordings, to annotations by fellow students, mind maps and drawings, the student can gradually weave his own learning web. Tools like Xmind, Diigo, Zotero, Evernote, Mendeley, Twitter, Scoop.it, etc. make sure that valuable information is not lost but instead becomes part of a learned, sustained memory.

Instead of imposing corporate learning management systems onto students, HE institutions can start by opening up their materials as OERs and place the initiative into the students' hands by offering training in self-sufficiency and autonomy. Classes in mindmapping, managing bibliographic references, annotation and curation are becoming increasingly popular, and more and more students self-organise to make grassroots versions of courses, students' lecture notes etc.[18]

One of the essential skills students can gain by working with Open course materials is content curation. Many useful tools are available to track content, to curate and comment on its contents, and to selectively share them with others depending on shared interests. The most limiting aspect of closed, non-open courses is precisely that they are so difficult to cite, comment on and share.

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15 Massive Open Online Courses, see http://en.wikipedia.org/wiki/Massive_open_online_course
16 Virtual Learning Environment, see http://en.wikipedia.org/wiki/Virtual_learning_environment
17 Personal Learning Environment, see http://en.wikipedia.org/wiki/Personal_learning_environment
18 See e.g. http://asucstudentaffairs.berkeley.edu/asinside.aspx?uid=32

MOOCs

MOOCs, the hype of 2012, are definitely here to stay. While vigorous debates are taking place both around pedagogy and university policies and education politics, the reality is that many key stakeholders and players in the education field recognise the transformational powers of this concept, whether they actually support it or not[19].
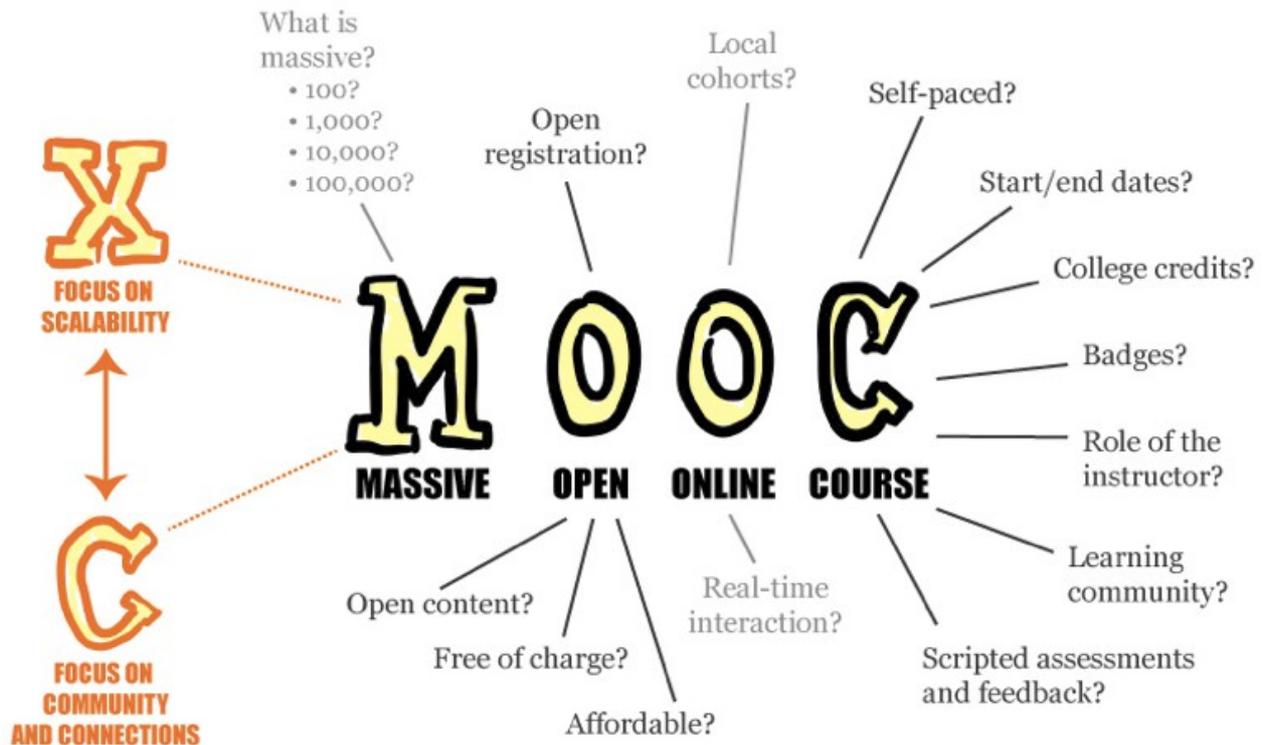
"Every letter is negotiable", CC-BY Mathieu Plourde[20]

The idea to reproduce the entire classroom experience online, by allowing students to take part in an online class, being a member of a cohort, and completing a course in a scheduled manner, has added a dimension previously missing in classic OpenCourseWare – the temporal dimension so essential in learning.

While the current debate has focused on large xMOOCs in which very large audiences can be reached and correspondingly large investments can subsequently be attracted to reach new quality levels and enhanced user experience, hundreds of smaller MOOCs tailored to more specific educational needs have been flourishing. They offer an opportunity to reach out to groups of learners hitherto barred from proper access to the education they need. Institutions can use the MOOC technology for a wide range of specifically targeted initiatives to respond to these opportunities. Possible scenarios include:

- Online "junior colleges": entry-level university courses to attract primary and secondary-education students to the world of science and technology and to foster their ambition to attend college;

- Teaser courses to attract students and professionals alike to develop a taste for a specific research

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19 Leading universities such as MIT, Berkeley, Harvard etc. have joined forces in eDX (http://www.edx.org); British universities have joined Futurelearn (https://www.futurelearn.com/). Open universities have launched OpenUpED (http://www.openuped.eu); the French Université Numérique has launched MOOCs: http://www.france-universite-numerique.fr/moocs-18.html, a state-sponsored initiative.

20 http://www.flickr.com/photos/mathplourde/8620174342

field;

- Preparatory courses: these courses integrate well with policies to enhance student exchanges and mobility. Students can already complete a number of courses online to better prepare them for a stay at a university abroad. They can also be used to facilitate access to master's programmes for candidate students who do not already meet the admission requirements;

- Permanent and continued education, in which departments can offer refresher courses and state-of-the art updates to alumni to keep them abreast of developments in their research field in an on-the-job learning context.

Learning Commons

But there is another trend that HE institutions should closely watch: the last decade has seen an increased socialisation of student life. Where computers supposedly glued students to their PC screens, they actually sometimes prefer to gather in libraries and study landscapes to study together[21]. This has led universities both in the US and throughout Europe to invest in purposely built study landscapes where students can find adapted accommodation to work and study in optimal conditions. Many libraries have transformed part of their spaces into student-driven, more informal gathering places packed with information technologies and high-bandwidth access to digital collections called "Learning Commons".

We witnessed these developments from up close with for instance the Agora Learning space in Leuven[22] and the Learning Lab Lyon[23]. Whereas the former targets students, the latter is a complete research lab for teachers which offers technological teaching appliances and resources.

The mix of virtual and face-to-face is becoming more and more mainstream, both in the library world and the university education world.

Learning Analytics

Learning analytics are one of the main innovations driving the MOOC world. Although learning statistics were already present in classic Learning Management systems, these were typically distribution-oriented platforms in which little learning occurred online. In many cases, the learning environment was a kind of repository where students could download slides and PDF documents. Only in specific cases such as language training did the real learning interaction take place in these LMS platforms. With the advent of MOOCs, that has changed. Not only can one monitor the way the web lectures are watched, replayed etc., but significant interactivity is also achieved to assess how students interact with the lectures and other materials. This way, a true monitoring of the learning experience takes place. As a number of recent conferences such as LAK13[24] have shown, this opens up an entire new world of pedagogical, cognitive and epistemological research, which is almost certain to lead to many improvements of the online learning user experience.

Students might be wary of being monitored while engaging with online study materials, but they will ultimately benefit from the information gathered. Many efforts are currently being directed towards avoiding high dropout rates, but this is just the beginning.

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21 Truyen, F., Touzé, S., Berthet, J. (2013). Learning Spaces, Learning Labs, and MOOCs: merging the real and the virtual in connected learning. The Open and Flexible Higher Education Conference 2013: "Transition to open and on-line education in European universities". EADTU. Paris, 23-25/10/2013 (pp. 416-425). Heerlen: EADTU.

22 http://agora.kuleuven.be, read more about it: http://designinglibraries.org.uk/index.asp?PageID=444

23 http://learninglabeducation.com/

24 http://lakconference2013.wordpress.com/

Certification

We are increasingly becoming a learning society. In addition to formal education, we are likely to see an ever-increasing share of semi-formalised education in which people can, throughout their careers, follow specific training and earn some type of credit for it. On top of a basic diploma, certificates, badges, statements of completion etc. can be obtained; earning credits in online gaming is a well-known example that is gaining more and more prestige.

This trend toward so-called micro-credentials is already popular in the ICT world[25], but has become mainstream in other fields too. It allows for much more targeted education. People can now obtain a badge for online courses they took[26]. They can include this in their CV for possible employers. Since knowledge is evolving so rapidly, this could quickly become more relevant than a formal degree in a particular field obtained more than 10 years ago. More and more, this formal education will indicate the general level of your education, that is, whether you obtained a master or PhD. But your actual proof of relevant knowledge to the employer needs to be up-to-date, and here these kinds of certifications come in handy.

But it might also be a possibility to reach out to students who originally dropped out of formal education and are experiencing difficulties in finding a job. If the OER, OCW and Open Education communities take their mission seriously, they should aim to offer those students an opportunity to develop recognised skills and knowledge that could help them to obtain employment. A certificate of some sort is a welcome addition to the concept of an open course in this case.

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25 See e.g. http://www.edutopia.org/blog/micro-credentials-empowering-lifelong-learners-krista-moroder

26 http://www.forbes.com/sites/jamesmarshallcrotty/2013/02/25/new-improved-badges-give-credential-meat-to-mooc-revolution/

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