

I.S.S.N.: 1138-2783

## **ANALYSIS OF SUCCESSFUL MODES FOR THE IMPLEMENTATION AND USE OF OPEN COURSE WARE (OCW) & OPEN EDUCATIONAL RESOURCES (OER) IN HIGHER EDUCATION. THE VIRTUAL MOBILITY CASE**

(ANÁLISIS DE EXPERIENCIAS DE ÉXITO EN LA IMPLANTACIÓN Y USO DE RECURSOS EDUCATIVOS ABIERTOS EN LA EDUCACIÓN SUPERIOR. EL CASO DE LA MOVILIDAD VIRTUAL)

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### **ABSTRACT**

This paper presents results from research on the use of OCW and OER in Higher Education (HE). The research was carried out with leaders of OCW/OER initiatives at HE Institutions and Organizations around the world. The aim was to identify successful practices for implementation and use of OCW/OER in HE and to investigate how OCW/OER could facilitate student virtual mobility. This work has been planned as part of the project “OpenCourseWare (OCW) in the European HE context” carried out with the support of the Lifelong Learning Programme of the European Union. The focus of the project is the creation of preconditions for a strong European/OCW framework and, as a consequence, a decline of obstacles to cooperation between European institutes, and therefore an increase in real student mobility.

**Keywords:** open educational resources (OER), opencourseware (OCW), virtual mobility.

### **RESUMEN**

Este trabajo muestra los resultados de una investigación sobre el uso de OCW y OER en la Educación Superior realizada entre líderes de iniciativas de OCW/OER de todo el mundo. Su propósito fue identificar prácticas de implantación y uso e investigar cómo, en particular, se podía facilitar la movilidad virtual de estudiantes. El trabajo forma parte del proyecto “Open Course Ware (OCW) in the European HE context” realizado con el soporte de Lifelong Learning Programme de la Unión Europea. El objetivo del proyecto se basa en la creación de precondiciones para un entorno fuerte europeo OCW y como consecuencia

romper los obstáculos entre instituciones europeas y por ello incrementar la movilidad real de estudiantes.

**Palabras clave:** recursos educativos abiertos (REA), opencourse ware (OCW), movilidad virtual.

The aim of the paper is not to provide a thorough analysis of the use of OCW/OER around the world, but to highlight important lessons learned from the studied initiatives. The findings provide important insights into factors that enable as well as inhibit implementation and use of OCW/OER in HE and subsequently enable or inhibit student virtual mobility. These factors are predominantly related to institutional support, copyright or faculty perceptions and attitudes towards open sharing in education. Furthermore, it appears from the findings that insufficient consideration is placed on how OCW/OER could facilitate student virtual mobility. In conclusion, we highlight important successful lessons learnt for the implementation and use of OCW/OER in HE and briefly propose next steps for developing scenarios for the promotion of student virtual mobility through the use of OCW/OER.

This research was carried out as part of the Project on *“OpenCourseWare in the European Higher Education Context: how to make use of its full potential for virtual mobility”*. The Project is contextualized within the framework *“Mobility strategies and removal of barriers to mobility in HE”* (Erasmus Multilateral Projects, 2013). One of the Project’s aims is to identify existing scenarios, and propose new ones, for the promotion of virtual mobility for students and lifelong learners by using OCW in a European environment. The focus of the Project is the creation of preconditions for a strong European OCW framework. A stronger framework, we believe, will mean closer cooperation between European institutes, which may result in mutual use of materials. Mutual sharing and use of materials will enhance quality and increase the usage of online courses, therefore facilitating virtual student mobility and an increase in real student mobility. An improved European OCW network will improve conditions for lifelong learners, an important user group of OCW/OER. The Project is carried out with support of the Lifelong Learning Programme of the European Union.

## METHODOLOGY

In consultation with the Project partners, a survey instrument containing 26 questions (closed and open-ended) was developed during January/February 2012. The questions were related to the following aspects:

- Motivation behind implementing OCW/OER initiatives.
- Characteristics of the initiatives such as licenses used, types of materials published under open licenses, language of materials or links to repositories where OCW/OER are stored.
- Use of OCW/OER in Teaching & Learning. Questions in this category were soliciting feedback related to the ways in which OCW/OER are used in teaching and learning, to describing characteristics of learners and faculty involved in the projects or to providing information as to how the learning process via OCW/OER is evaluated or certified (if applicable).
- Exploration of factors that inhibit or enable implementation of OCW/OER initiatives as well as identification of benefits to the institutions involved in OCW/OER initiatives.
- Existence of open content policies (institutional or national).

For this paper, we consider responses only to a selected number of questions; questions that we consider relevant when attempting to identify modes for successful implementation and use of OCW/OER. A full report, incorporating analyses of all questions in the survey instrument, will be available on the Project's website (OCW Europe, 2013) as part of Deliverable 1.1 under Work Package 1.

Responses to the survey were received from 31 Higher Education Institutions and organizations (see Table 1 below) from 14 different countries namely the United States, South Korea, United Kingdom, Indonesia, Taiwan, Israel, Spain, Dominican Republic, Canada, Estonia, Portugal, Finland, Germany and Italy.

<b>Names of Institutions</b>	<b>Links to information about the Initiatives</b>
Johns Hopkins School of Public Health	<a href="http://ocw.jhsph.edu">ocw.jhsph.edu</a>
People's Open Access Education Initiative	<a href="http://peoples-uni.org">http://peoples-uni.org</a>
MEITAL	<a href="http://maor.iucc.ac.il/about_en.php">http://maor.iucc.ac.il/about_en.php</a>
Sterling College	<i>Not yet applicable</i>
Silla University	<a href="http://ocw.silla.ac.kr">http://ocw.silla.ac.kr</a>
APTİKOM	<a href="http://www.aptikom.or.id">www.aptikom.or.id</a> ; <a href="http://lms.aptikom.biz/">http://lms.aptikom.biz/</a>
Taipei Medical University	<a href="http://ocw.tmu.edu.tw">http://ocw.tmu.edu.tw</a> ; <a href="http://ocw2.tmu.edu.tw">http://ocw2.tmu.edu.tw</a>

<b>Names of Institutions</b>	<b>Links to information about the Initiatives</b>
Centro de Enseñanzas Virtuales de la Universidad de Granada	<a href="http://ocw.ugr.es">http://ocw.ugr.es</a> & <a href="http://cevug.ugr.es">http://cevug.ugr.es</a>
Universitat de Barcelona	<a href="http://ocw.ub.edu">http://ocw.ub.edu</a> & <a href="http://diposit.ub.edu">http://diposit.ub.edu</a>
Universidad de Cantabria	<a href="http://ocw.unican.es/">http://ocw.unican.es/</a>
Universidad Carlos III de Madrid	<a href="http://ocw.uc3m.es">http://ocw.uc3m.es</a>
Universidad Nacional de Educación a Distancia	<a href="http://ocw.uned.es">http://ocw.uned.es</a>
Universitat Politècnica de Valencia	<a href="http://ocw.upv.es">http://ocw.upv.es</a> & <a href="http://ocw.universia.net/">http://ocw.universia.net/</a>
Instituto Tecnológico de Las Américas (ITLA)	<a href="http://ocw.itla.edu.do/">http://ocw.itla.edu.do/</a>
The Saylor Foundation	<a href="http://www.saylor.org">www.saylor.org</a>
Open.Michigan	<a href="http://open.umich.edu">open.umich.edu</a>
OCAD University Inclusive Design Institute	<a href="http://www.atutor.ca/acontent">http://www.atutor.ca/acontent</a>
National Taiwan Normal University	<a href="http://ocw.lib.ntnu.edu.tw">http://ocw.lib.ntnu.edu.tw</a>
Universidad de Sevilla	<a href="http://ocwus.us.es">http://ocwus.us.es</a>
MIT	<a href="http://ocw.mit.edu/about/">http://ocw.mit.edu/about/</a>
University of California, Irvine	<a href="http://ocw.uci.edu">http://ocw.uci.edu</a>
The Open University UK	<a href="http://www.open.edu/openlearn/">http://www.open.edu/openlearn/</a>
Tallinn University	<a href="http://www.e-ope.ee/repositoorium">http://www.e-ope.ee/repositoorium</a> & <a href="http://www.thu.ee/">http://www.thu.ee/</a>
Universitat Oberta de Catalunya	<a href="http://ocw.uoc.edu">ocw.uoc.edu</a> & <a href="http://openaccess.uoc.edu">openaccess.uoc.edu</a>
Universidade Aberta, PT	LECH and Netcu Erasmus projects
The Open University of Israel	<a href="http://ocw.openu.ac.il/">http://ocw.openu.ac.il/</a>
Metropolia UAS	<a href="http://ocw.metropolia.fi/">http://ocw.metropolia.fi/</a>
Cogi, Inc	<a href="http://www.cogi.com/">http://www.cogi.com/</a>
FernUniversität in Hagen	<a href="http://ifbm.fernuni-hagen.de/ifbmimpuls">http://ifbm.fernuni-hagen.de/ifbmimpuls</a>
Università Telematica Internazionale Uninettuno	<a href="http://tiny.cc/iwyiyiw">http://tiny.cc/iwyiyiw</a>
Universidad Politécnica de Madrid	<a href="http://ocw.upm.es">http://ocw.upm.es</a>

Table 1. Institutions participating in the study

## ANALYSIS OF RESULTS

### Characteristics of studied OCW/OER Initiatives

Majority of respondents (81%) defined initiatives at their Institutions as OpenCourseWare (OCW), with the remaining 19% contextualizing their projects within the broader spectrum of Open Educational Resources (OER).

Most of the OCW/OER from the initiatives described in this paper are located within institutional repositories with a number of them being also available in external repositories. Such repositories include YouTube, iTunesU and more. The OCW/OER materials are published under a variety of Creative Commons (CC) licenses and in more than 20 different languages.

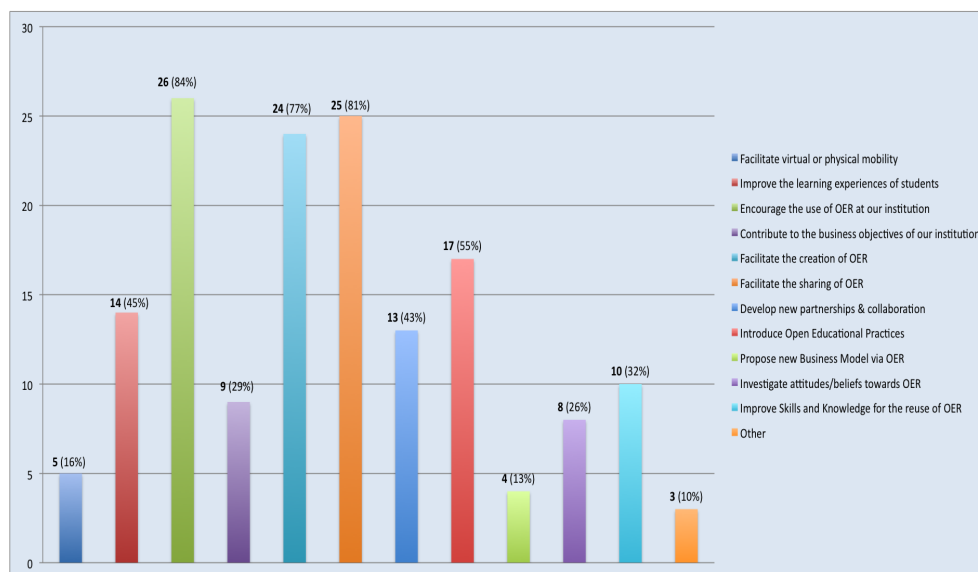


Figure 1. Goals & Objectives of OCW/OER initiatives. Respondents could select more than one option, therefore totals and percentages add up to more than 31/100%

The results (see Figure 1) suggest that the main aims of these initiatives are to promote creation, sharing and use of OCW/OER at their institutions. OER/OCW projects are also introduced with the aim to improve existing educational materials or to improve learning experiences of students. On the contrary to this, there is no special emphasis on investigating attitudes and beliefs towards OCW/OER. Furthermore, little attention appears to be given to how OCW/OER could facilitate physical or virtual mobility.

A number of respondents stated that OCW/OER initiatives are aligned with their institutional vision/mission or existing policies to provide, increase or widen access to education/educational materials. Furthermore, such initiatives are also considered to be important in the context of an institution's marketing activities. OCW/OER materials are used to showcase educational quality to the rest of the world, in order to develop new partnerships or collaborations or to attract new students into formal degree programs.

Respondents commented with the following:

*“(OCW/OER) extend the mission of the School which is to provide education in public health discipline to include those who may not be able to enroll in degree programs”.*

*“Our University is trying to use OCW as a way to encourage professors to use New Technologies in Education. We also try to improve our educational materials, to show what we do all over the world and to improve the learning experiences of the students”.*

*“The OCW movement forms part of the solidarity policies of the university management team whose aim is to take knowledge to countries with less educational resources and to under privileged sectors. The fact that this is a worldwide movement also fits the international cooperation policies of our university. At the same time, our OCW site is a showcase of the university's high teaching standards resulting in a way to attract new students”.*

*“The Saylor Foundation is a non-profit whose mission is to provide free education for all, deploying openly-available resources in fully-articulated, college-level courses. These courses are made available online for use by anyone at any time; we especially seek to assist those students who have limited opportunities for higher education as a result of excessive cost, geography, or other barriers to access”.*

*“Sharing our best-practices for the public good, and facilitating the usage of OERs among other universities in Israel. The pioneering of the OCW project at the Open University of Israel catalyzed the participation of other institutions”.*

*“The purpose is to set up a site for sharing courseware in our university and promote the usage of OER - both creating them and using them”.*

*“The primary use of our OER is to allow the wider and simpler access to knowledge to disadvantaged people”.*

*“We support the university’s mission, including education for all. We support goals both of individual professors, some of whom are committed to the general idea of the project as well as support the university’s interests through raising its profile among a wide variety of audiences”.*

<b>The use of OCW/OER in Teaching and Learning</b>	<b>Frequency</b>	<b>Percentage</b>
To achieve professional qualifications	7	22%
To obtain official degrees	4	13%
To support teaching	25	78%
To increase physical mobility	2	6%
To increase virtual mobility	6	19%
To simply provide open materials	24	75%
Other	7	22%

*Table 2. How OCW/OER are used in the context of teaching and learning. Respondents could select more than one option, therefore totals and percentages add up to more than 31/100%*

The findings (see Table 2) indicate that OCW/OER are predominantly used to support teaching & learning activities, or to simply provide access to learning materials (by making course content available in online repositories under open licenses). As stated earlier, there is very little consideration as to how OCW/OER could increase virtual or physical student mobility or how learning achieved via OCW/OER could count towards formal degrees or qualifications.

In a small number of cases, OCW/OER are integrated in the curriculum. Students are expected to use OCW/OER as part of their course requirements and the learning is formally evaluated (through exams). In some cases, the evaluation process counts towards students’ final course mark. In other cases, it creates opportunities for students to earn a credit or to obtain a certificate of completion. These are important findings to consider when thinking of ways to encourage the use of OCW/OER but also when considering how such materials could facilitate virtual or physical student mobility.

Respondents commented the following:

*“There are some professors using OCW at the classroom, or using it as an “e-learning” tool. Moreover, we are working with some faculties to show all their courses in OCW: Nursing, Economics, Business Administration, Mines and Energetic Resources. In the future, we think that it could be possible to use OCW for postgraduate courses or for lifelong learning”.*

*“OER are not officially integrated in the curricula but some instructors direct their own students to their OCW course as an alternative to the same course on the university learning platform”.*

*“Is supporting the teaching and learning process”.*

*“The typical use case is a professor referencing their own video lectures and materials for use of current students”.*

*“This is in three ways. A proportion of every course/module (5%) is made openly available. Equally all module teams are encouraged and supported in identifying OER to include as resources for their module. Lastly OER are used as part of e-learning journey for people to move from informal learning to formal learning and back again as part of their lifelong learning”.*

*“As the main materials supporting the teaching of the courses (formal or informal)”.*

*“Some OER are well organized. Each week, I require student read one topic according to the OER schedule. Then, I assign homework, either in team or in person. Students have to submit the homework on time each week”.*

*“Faculty use OER when creating lecture content and courses that include a large component of online technologies. Many of our undergraduate courses are large at U-M and faculty use online content to complement the class and lab sizes. Much of this includes interactive experiences, like OER or Open Access quizzes, digitized primary source documentation and original video content”.*

*“They use the OCW site to support flexibility in classes, eg. one section used the video lectures rather than a face-to-face course and another was able to accommodate student absences around holidays. Otherwise, we can't report different educational designs based on OERs”.*



*“There is homework each week. The instructor will score the homework. In the end of one semester, Instructor will count all the scores and come up a final score. If students pass, they can get the credits”.*

*“We are incorporating badges into the Open.Michigan experience for our community members who go through training, attend events or publish content with open licenses. These badges will eventually address learning needs and may potentially support the review of an OER module hosted on the Open.Michigan collection”.*

*“Currently, each of our courses concludes with a final examination, which is administered through Moodle.com. Individuals receiving a grade of a 70% or higher on the final exam are given the option to download a certificate of completion. In the future, we plan to issue Mozilla open badges in addition to certificates”.*

*“We will create badges that are tied to some sort of evidence, to be determined, but most likely based on quizzes”.*

## **Factors that Enable or Inhibit Implementation and Use of OCW/OER in HE**

Respondents identified a number of factors that contribute to successful implementation of OCW/OER initiatives. These are related to the following aspects:

- Institutional support

An institution supports open sharing in education through:

- Actively encouraging participation in the production and sharing of OCW/OER amongst faculty members
  - Implementing open content or open access policies
  - Providing resources (financial and staff) to assist faculty members in the production of OCW/OER
  - Providing incentives to faculty members to engage in the production and sharing of OCW/OER
- Positive attitudes from faculty members

The respondents commented the following:

*“Enthusiasm and determination of OCW Office team. Firm belief of faculty in OCW movement”.*

*“We incentivize the production of OER with a small economic prize. We also issue certificates of the produced OER so that faculty can include it in their educational curricula”.*

*“Teachers remuneration”.*

*“Institutional and staff support”.*

*“Personal enthusiasm of some academics, support of European projects and development funds, organizational culture”.*

*“Senior management wants to keep the project going. A new portal is expected to be launched in 2013 with new technology”.*

*“Many teachers are eager to publish the material, and the general attitude to this is great”.*

*“...We also have institutionally supported open access initiatives on campus”.*

*“Thanks to incentive programs to our faculty, we have achieved an increased number of annual contributions to the OCW repository of our university”.*

*“More than 200 teachers of our university have worked with us. We give to them all the facilities to upload their materials and to improve them”.*

*“Faculty from all disciplines taught at UC3M take part in the OCW project. They are provided with support from the OCW Office but most of them follow our DIY model for sustainable course production, and do most of the production process by themselves...”.*

*“Helsinki University has committed to publish all research openly”.*

The factors that inhibit implementation of OCW/OER projects or that inhibit the use of OCW/OER (especially when attempting to reuse materials produced elsewhere) are the following:

- Lack of institutional support.
- Negative attitudes from faculty.
- Copyright-related challenges.
- Lack of information about institutional benefits related to OCW/OER projects.
- Difficulties with finding appropriate and quality OCW/OER (when attempting to reuse materials produced elsewhere).

The respondents commented the following:

*“Lack of information. Copyright issues when authors reuse materials from others. Lack of official institutional support”.*

*“We have problems with copyright (we have to find new resources or make them)”.*

*“When we are working with a full degree, sometimes we have problems with some professors, because they don’t want to participate. We would like more implications for the Institution (direct link from the main page of our university to OCW)”.*

*“Copyright-related issues are complicated and can require considerable time and effort on behalf of the OCW Office staff, to help faculty clear their materials of third party IP rights. The project is run with limited resources, a team of 3 (1 full time, 2 part-time), but has not been a drawback to encouraging faculty to take part in our OCW project and to being an active member of the OCW movement”.*

*“Motivational issues for teaching staff combined with institutional support factors”.*

*“Lack of resources to help faculty in the creation of OER. We try to make available to the faculty a wide range of tools that they can use to produce the OER by themselves, or with a little help from our staff”.*

*“Negative attitudes from faculty. The teachers’ time”.*

*“We intend one day to host 100% of our materials. The barriers have been (1) finding sufficient, quality OER, (2) Managing dead links to external materials, and (3) dealing with copyright barriers and some resistance of content owners to re-license their material”.*

*“Currently we are not fully supported by the university, but housed in the Medical School. Our university is primarily focused on in-person education and we can face some resistance from faculty about “giving away” their content. There is still confusion (at all levels) about what licenses are, how they work with copyright and what it means to use them and we continue to educate our community about these issues”.*

*“This is a topic in our e-learning Council of ... University right now and preparing a new e-learning strategy for our university. The teaching load is very high and it is not always easy to motivate teachers to use extra time in developing OERs. There are no motivation systems and involvement of different faculties varies. The institutional support is weak”.*

*“Copyright issues were resolved through a special budget allocated to clearing rights where needed. While the senior management was supportive, the faculty failed to cooperate and could not identify with the project goals”.*

### **Observed benefits of OCW/OER initiatives to the Institutions**

Respondents identified several benefits to their institutions resulting from their OCW/OER projects, such as increased international visibility (based on user statistics), increased numbers of students (in some cases) and new collaborations:

*“Content of OCW courses is used by educators, professionals, and independent learners, as seen from anecdotal results from feedback”.*

*“Providing OCW has become one of the University’s KPIs”.*

*“This initiative does not yet apply to any business model but could be in the future. Benefits come for the increase of visibility and collaboration at international level”.*

*“Now we have more than 70.000 visits every month...”.*

*“Benefits obtained:*

- *Collaboration with other universities*
- *Greater visibility for faculty and for their course materials*
- *Recognition for faculty (awards).*
- *University showcase, of interest to school leavers, to attract new students”.*

*“As a public university in an era of austerity, the attraction of highly qualified students outside of California is a core goal. The OCW website attracts 1/3 of its visitors from the rest of the US and 1/3 internationally. Reputationally, we are becoming known for our OCW projects in many parts of the world. On an outbound basis, professors look for a way to send their materials to colleagues in other countries”.*

*“More internationalization, more students, marketing of our materials, promotion of the university”.*

## **IDENTIFICATION OF SCENARIOS; AN EXAMPLE**

Based on the findings, information related to the various uses of OCW/OER in HE was organized into a mindmap (see Figure 2).

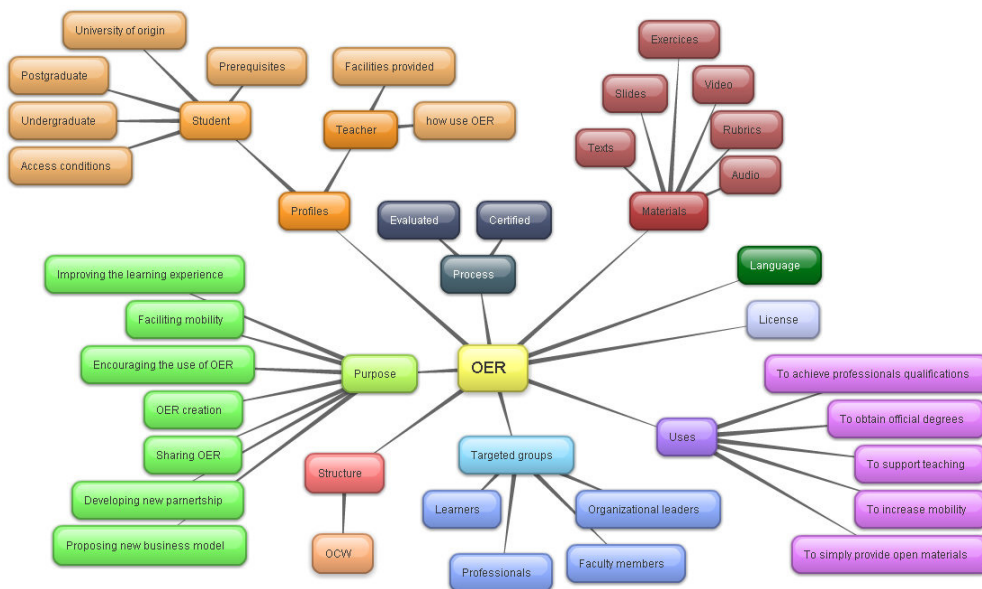


Figure 2. Uses of OER

This instrument was used in a workshop on “*Scenarios for the promotion of virtual mobility by using OCW*” during Cambridge 2012 (OCWC Global) Conference. The aim of the workshop was to identify successful OCW scenarios to reach virtual mobility between HE Institutions in the European Union. Ultimately, these scenarios will be used to elaborate guidelines for the successful implementation and use of OCW for virtual mobility.

During the workshop thirteen different families of scenarios were defined. By scenarios we mean narratives describing what people do when engaged in particular activities; and are basically a baseline to elaborate guidelines for the successful implementation and use of OCW in virtual mobility.

### Example of a scenario

The example shown in this work interprets OCW for transparency on curricula and transfer of credits:

The signing of the *learning agreement* covers the learning materials that a student will take at another institution and involves recognition of credits relating to such materials in the center of origin. In order to validate learning from another

institution we need to assess the content of the curricula. If materials are open (as OER/OCW), the educational assessment of credits awarded is much more accurate and objective.

From an institutional point of view, the publication of such OCW facilitates collaboration among teachers of similar subjects in the centers of origin and destination, which can easily lead to the creation of international academic and research networks.

This example was obtained from a person who has experience in *credit transfer programs*:

*Mario is the ECTS coordinator at the Computer Science College – UPM, Spain. He is in charge of the evaluation of the courses content his students could take at host institutions, in order approve them and to include them in the Learning Agreement.*

*He always has the same problem: a lot of times it is not possible to know in advance the courses content his students want to take at host institution, sometimes because this information is not available on the web site or sometimes because the information is not updated. If the information is not available it may happen that, at best, the Learning agreement needs to be changed later and, at worst, the course will not be validated at home university.*

*But Mario finds out that some universities have their materials open, which helps him to assess accuracy of the contents, the objective assessment of the credits and the grading system used. This information allows the coordinator to sign the students' Learning Agreement with total confidence and guarantee. The OCW materials definitely help Mario to improve the future recognition of the courses the students take at host institutions.*

*Moreover, Mario starts collaborations with other teachers involved in the same topic he is working in. They are planning to create an international research group in the near future.*



Figure 3. A comic representing a scenario for credit transfer mobility program  
The comic was created through software application available at Toondoo.com

## CONCLUSION

The lessons learnt from this research indicate that there are a number of factors which need to be considered with regard to successful implementation and use of OCW/OER in Higher Education. Institutional support and positive attitudes from faculty members have been identified as the most important enablers for such initiatives but can also act as major inhibitors as far as lack of institutional support or negative attitudes from faculty members are concerned. Incentive programmes for faculty members proved to be beneficial to encourage participation in the production and sharing of OCW/OER. Copyright-related challenges, plus issues related to finding appropriate and good quality OCW/OER, both act as inhibitors to either producing or reusing/repurposing OCW/OER produced elsewhere. This highlights the need



for continuous training and support in this regard. Furthermore, there is a need for more institutional case studies or success stories describing best practices and lessons learnt, as well as highlighting institutional benefits to implementing OCW/OER initiatives at HE institutions. Finally, the findings revealed that insufficient consideration is given to how OCW/OER could facilitate student virtual mobility, which is the main focus of this European research Project.

In order to facilitate implementation of virtual mobility scenarios via OCW, we are developing a quality framework oriented towards HE institutions, including guidelines and recommendations for the implementation of OCW. Mobility scenarios, introduced through an example in this paper, helped to us to contextualize this quality model in line with the goals of this project, providing mechanisms and tools to implement successful OCW initiatives.

## ACKNOWLEDGEMENTS

This research was carried out as part of the project on “OpenCourseWare in the European HE context How to make use of its full potential for virtual mobility” with the support of the Lifelong Learning Programme of the European Union.

Authors would like to thank to the Project partners for their valuable contribution to this study.

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Fecha de recepción: 13/06/2013

Fecha de aceptación: 05/12/2013

#### Como citar este artículo:

Tovar Caro, E.; Lesko, I. (2014). Analysis of successful modes for the implementation and use of OpenCourseWare (OCW) & Open Educational Resources (OER) in Higher Education. The virtual mobility case. *RIED. Revista Iberoamericana de Educación a Distancia*, volumen 17, nº 1, pp. 131-148.