



Innovative OER in European Higher Education:

Best Practice Report Multicampus

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OER HE

Coordinating Institution

European Association of Distance Teaching Universities | EADTU

Partner institutions

European Association of Distance Teaching Universities | The Netherlands

Universidade Aberta | Portugal

Open Universiteit Nederland | The Netherlands

Universidad Nacional de Educación a Distancia | Spain

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Table of Contents

0. Introduction.....	4
MultiCampus: working definition.....	4
1. Institutional OER Objectives.....	6
A. Open Universiteit Nederland (OUNL)	6
B. K.U.Leuven Association	9
C. UOC.....	11
2. Approach towards Open Courseware implementation	12
1. Pedagogical.....	12
A. NOP-I (OUNL)	12
B. K.U.Leuven Association	13
C. UOC.....	13
2. Technological.....	14
A. Open Universiteit Nederland	14
B. K.U.Leuven Association	16
C. UOC.....	17
3. Organizational	17
A. Open Universiteit Nederland	18
B. K.U.Leuven Association	19
C. UOC.....	22
3. Development Plan	23
A. OUNL- NOP.....	23
B. K.U.Leuven Association	23
C. UOC.....	24
4. Multicampus scenario's.....	28
A. OUNL	28
B. K.U.Leuven Association	29
C. UOC.....	29
5. Common Strategies	30
A. Basic principles of Multicampus OER	30
B. The "course" concept	32
C. Licensing models	33
6. Conclusion	36
Bibliography OER-HE	37

0. Introduction

With Open Universiteit Nederland (OUNL), Universitat Oberta de Catalunya (UOC) and Katholieke Universiteit Leuven (K.U.Leuven), we have three very different institutions that are looking into OER.

OUNL has the explicit mission to provide Open Education in the Netherlands and Flemish-speaking Belgium, and has a widening participation role towards more classical education, as is exemplified by its role in the Networked Open Polytechnics (NOP). K.U.Leuven is a traditional University (the 4th oldest in Europe), with about 37.000 students on Campus and totaling 75.000 in a regionally spread university Association. UOC is a radical distance teaching University that provides Open education through innovative technologies.

Widening participation is certainly a common ingredient in the reasons for looking at OER, but the three institutions do have their own very specific motives to pursue this line of action. For OUNL, it follows from the role it is supposed to play within the NOP network, where quality content will be a common standard delivered to the polytechnics, and OUNL also takes the role of pedagogical innovator. In the K.U.Leuven context, the relation between the University and the Institutions for Higher Education within the Association is more bi-directional: the institutions in the first place have an independent pedagogical concept, and also host disciplines that are not covered by K.U.Leuven. The aim of multicampus OER is in this case more a sharing of expertise, with collaboration on the content. Whereas for UOC, the high quality, finished open course products are part of their added value and they need to be delivered and finalized before they are used. OER is key to be able to not only provide new high-quality course content at reduced cost, by optimizing the use of already available open content.

We will show that in these different contexts, OER indeed proves to be an enabling factor offering solutions to quite different problems, but that on the other hand from the different stakes follows an impact on how OER courses are conceived, and what kind of "products" they involve. There is also an impact on the kind of Open licensing involved, which leads to different choices from the available Creative Commons licensing models.

MultiCampus: working definition

In this report, we will focus on how OER can be part of a strategy for institutions that are facing the challenge of organizing multicampus higher education. Under multicampus, we understand:

Any higher education setting that involves delivering study curricula to campuses at different locations under one institutional umbrella, whether this is one individual institution or a network of institutions, and regardless whether the delivery method is physical, entirely virtual or blended.

So, in our view a valid multicampus approach could also be an entirely virtual campus setup¹. For the European Commission, the latter is:

Cooperation between higher education institutions in the field of e-learning, regarding: design of joint curricula development by several universities, including agreements for the

¹ See for a definition of Virtual Campus: http://www.virtualcampuses.eu/index.php/Virtual_campus

evaluation, validation and recognition of acquired competences, subject to national procedures; large-scale experiments of virtual mobility in addition to physical mobility and development of innovative dual mode curricula, based on both traditional and on-line learning methods. This broad definition involves many issues from partnerships between traditional and/or distance universities and HEI with a view to offering joint certifications (for undergraduate and/or postgraduate levels) and cooperation with learning support services. This might also include collaborative activities in strategic areas of education or research through cooperation involving researchers, academics, students, management, administrative and technical personnel. 'Virtual campuses' should not be confused with e-learning platforms.

Source: http://ec.europa.eu/education/programmes/lip/guide/glossary_en.html

In our project we will however compare three quite different settings, two blended (K.U.Leuven and OUNL) and one virtual (UOC).

Today, with the economic need to merge organizations to obtain scale advantages in higher education, many institutions are faced with governmental demand to organize themselves across hitherto independent and often competing institutions into larger associations. These efforts are supposed to provide enhanced possibilities in offering complete curricula with the available human resources, and are meant to concentrate talent and combat duplicate efforts. Many European regions are in the process to integrate Higher education into University-led associations that can provide quality control and organize expensive curricula and the much needed logistics in a more efficient way.

Of course, the development of high quality, research based course content still stands out as an important cost factor, for which it is hoped that advances in ICT – both content related as well as focused on administration and delivery aspects – will allow to do more with less. In the knowledge economy, being able to capture the scarce expert knowledge and delivering it to larger audiences in an educational context is key to economic development. Providing regions with access to all relevant biomedical knowledge is as challenging as offering students the possibility to acquire the multi-language skills so essential to European trade, to cite just a few striking examples.

Europe's higher education future is paved along the road of ever larger institutions, professionally managed, with international reach yet strong regional embedding and with a healthy bond with local stakeholder communities. It is our strongest conviction that Open educational Resources play a decisive role in forging the right kind of educational apparatus, where transparency, quality and equal opportunities makes sure knowledge is there where it is needed and can contribute to growth.

1. Institutional OER Objectives

In this chapter we will discuss the current objectives and stated goals of OER in the three involved partner institutions and networks. In each case, we will list:

- Official policy documents detailing institutional strategy if any exist;
- Whether the participants are already subscribers to international Open Access policies or OER initiatives;
- The organizational level at which OER is being implemented;
- Project members' ambitions for OER policy in their respective institutions;
- Possibly identified action fields for which the current project could give beneficial input.

A. Open Universiteit Nederland (OUNL)

In 2009 the Executive Board as well as the Board of Trustees of the Open University in the Netherlands (OUNL) has approved a strategy of stepwise introduction of OER into the business model of the Open University. The first steps to implement this strategy have been taken and the first projects (for the Schools of Computer Science and Learning Sciences & Technologies) are on their way (see: <http://portal.ou.nl/en/home>) and <http://portal.ou.nl/en/web/informatica/startpagina>)

In Europe the Open Universities in the UK and NL were the first to take an interest in OER as a new approach combined with their powerful model of Open and Flexible Learning. The OUNL has initiated and is running OER projects within the institution and on the national and European level. The first project was called OpenER (Schuwer & Mulder, 2009).

The OpenER project tested Open Educational Resources (OER) and had three lines of action:

- lowering the thresholds to higher education, being institutional, formal, financial, social, of time, place and pace and programming;
- making access to high quality learning materials for independent learning easy and attractive;
- helping people to gain experiences that boost their self-confidence and motivation to cross the threshold to formal higher education.

Several European activities were executed under the EADTU umbrella with OUNL leadership: the EADTU OER Task Force, the MORIL project (Multilingual Open Resources for Independent Learning), and a series of OER seminars including one in collaboration with UNESCO in Paris. OUNL took the lead in international conferences to promote OER (EADTU Annual Conferences, the ICDE SCOP Meeting in 2007 in Heerlen, the ICDE/EADTU World Conference in 2009 in Maastricht, the UNESCO WCHE in 2009 in Paris). On the global level OUNL has chaired the ICDE Task Force on OER where UNESCO has been a partner. The Final Report was presented at the ICDE SCOP Meeting in 2008 in Shanghai and gives direction to further activities of ICDE and Open Universities around the world.

In 2009 the Dutch Ministry of Education launched a national OER initiative called Wikiwijs and OUNL has been one of the two leading partners. In 2010 OUNL has received a grant from the Dutch government to explore and recommend OER-based business models. First results have been presented in Helsdingen, Janssen & Schuwer (2010).

In 2010 OUNL was awarded an UNESCO Chair in OER. Another one was awarded to Athabasca University in Canada. The UNESCO Chair at Open Universiteit in the Netherlands is held by Dr. Fred

Mulder (Rector for more than 10 years until the end of 2010). UNESCO Chairs are a particularly appropriate means of supporting the OER movement. Chairs have a dual function as “think tanks and bridge builders between the academic world, civil society, local communities, research and policy-making. The chair at OUNL will build on the current OER research efforts at OUNL and will form a nucleus of a developing research group on OER (see: <http://oer.unescochair-ou.nl/>)

Open Educational Resources fit very well into the mission of the OUNL, which states that the Open Universiteit Nederland develops, provides and promotes innovative higher distance education of top quality, in collaboration with other HE-institutions in networks and alliances. As the Dutch prime university for lifelong learners, it addresses the wide-ranging learning needs of adult people during their course of life, plus the need to achieve a considerable upgrade of the knowledge level of the community at large. OUNL want to establish itself as the national centre for lifelong learning; the University for Lifelong Learners in the Netherlands.

For this, OUNL provides open, flexible higher distance HE services for adults, without setting any prerequisites regarding prior education of students. For this, OUNL provides open, flexible distance higher education programs and modules in different disciplines, leading to formal academic certificates and bachelor and master diplomas. OUNL acts de facto and de jure also as the Open University for the Flemish speaking part of Belgium, the regions Flanders and Brussels.

In addition to providing open and flexible distance education to adult learners, OUNL has a reputation as an international centre for research and innovation in the field of learning, at school, at work and at home. First there is the Netherlands Laboratory for Lifelong Learning (NeLLL), focusing on fundamental, application-oriented and innovative research. Secondly there is the Centre for Learning Sciences and Technologies (CELSTEC), being a Centre of Excellence in the fields of Learning Sciences and Technology Enhanced Learning. It aims to research, develop and provide sustainable and evidence-based solutions for the advancement of learning by combining state-of-the-art research with the innovative powers of new media, mobile devices and the Internet.

Thirdly, there is the Ruud de Moor Centre for the Professionalization of Teachers, helping to address the shortage of teachers in the Netherlands. All meaningful experience of the OUNL in distance education is brought together in order to enable teachers to work more professionally. Its goal is to promote the quality of learning on the job.

According to Dirk Van Damme, Head of the Centre for Educational Research and Innovation of the OECD, open and distance teaching universities can and must play a triggering role in bringing about the necessary changes and innovation in European higher education. OER may well be one of the instruments by which this necessary change and innovation can be achieved. For the OUNL it is clear that in the Netherlands as well in Europe lifelong learning should be enhanced, in the direction of individualized mass production of resources in relation with social networks of individualized learners. For this, new hybrid forms of both adult distance education and cooperative and collaborative learning are needed. The potentialities of Open Educational Resources may well be very useful in achieving this goal. But for this, new strategies and new business models are needed (Van Damme, 2009).

If we, however, look at actual practices of universities, lifelong learning activities are not yet organized sufficiently. This is hardly surprising if one looks at the principle task and target groups of most universities. They show conventional business models focusing on research and innovation and educational programming in a bachelor-master structure.

Entering the field of lifelong learning students means entering new (market) areas. This calls for other strategies and business models. In part this explains the hesitation of many universities to take

the next step in organizing lifelong learning. Lifelong learning is amongst others about developing structures for continuing education that fit the realities of the life of adults, in particular professionals, in order to help them to renew and develop their existing bodies of knowledge.

The Netherlands' capacity to compete in the global knowledge economy will depend heavily on whether it's higher education institutions can meet the fast growing demand for high-level skills. Several Dutch labor market studies showed that in the coming decade Dutch economy will be faced with a shortage of at least 100,000 people with high-level qualifications, which could increase up to 200.000 people, according the socio-economic development scenario. To meet this shortage, at least 10.000 people with high-level qualifications extra will be needed yearly. From a demographic point of view, it is very unlikely that the Dutch higher education institutions can meet this demand through the normal enrolment of young people. So, most part of the growth has to come from people who want to enter higher education in later stages of life, so, from people who want to engage themselves into lifelong learning.

In 2008 an OECD Review Team has expressed its concern regarding the progress that Dutch universities and polytechnics show in this respect. According to the OECD team, they generally seem to be failing to address the Lifelong Learning agenda, by not being sufficiently open to providing courses for students in later stages of life.

Therefore a breakthrough in lifelong learning in the Netherlands is needed, according to a broad alliance of national organization in 2008 (RWI, 2008) The Challenge for HE in the Netherlands is to increase the level of professional expertise in Dutch society, mainly for economic reasons, closely connected to globalization. This, however, cannot be achieved by expanding participation in initial education alone. Most social barriers to participation in initial education have been eliminated. For this reason HE must more and more target individuals, who wish to improve upon their initial education in later phases of their lives. Lifelong learners may well be better served by introducing more elements of Open and Flexible learning, as practiced by the Open University. Moreover, OER can be used as a powerful instrument in raising and widening significantly the participation in adult and lifelong learning. Using OER naturally bridges the divides between non-formal and formal learning.

Distance education

Open and Distance teaching universities are in a better position than conventional universities to serve lifelong learners. They focus on the development of learning materials in a distance learning context, primarily meant for independent self-study. Therefore their content is rich in pedagogy and didactics and incorporates learning guidance and tutoring elements. It is designed to be accessible to individuals, studying at home or at work, appropriate for their circumstances and meeting their needs. Often, the learning process takes place in an online (or: virtual) learning environment, which supports various kinds of interaction: student-student as well as student-tutor or teacher, both individual and grouped.

In The Netherlands distance education in higher education was introduced in 1984 by Open Universiteit Nederland, clearly modeled on the example of The Open University (UK), which started operations in 1970. Originally, the education model was mostly based on written materials. These were produced in-house and were completely self-contained, requiring no commercial textbooks to be used alongside. In addition to the written materials, elective tutoring sessions have always been available at a number of locations throughout The Netherlands and Dutch-speaking Belgium. It is only in recent years that these offerings have been supplemented with a number of web-based materials and services. It is expected that the latter will greatly increase, supplanting many of the functions previously assigned to the printed materials and face-to-face meetings.

Although Open Universiteit Netherland is licensed by law to provide professional higher education, its activities have always been limited to the academic sector. One reason for this is that the larger volume of professional education cannot be handled by its relatively small staff; another is that the teaching method, based on the written word as it is, is more suited to theoretical subjects, and also presupposes independent motivation and good study habits instilled by the students' secondary education. As students in the academic sphere usually have had a secondary education that was at a higher level and took more years than those seeking professional skills, they are more likely to satisfy this requirement.

The Network Open Polytechnics initiative of OUNL

There are three main target groups for the NOP-initiative:

- People who have initially opted for short and simple forms of education, but feel the need to extend their knowledge;
- People who have at some point abandoned their education career. There is a high number of dropouts characteristic of Dutch education system;
- People who have moved to a different field of expertise, by personal interest or job market pressure.

The first program that is being developed is the *Netwerk Open Hogeschool Informatica (NOP-I)(Computer Science) (Bijlsma, 2009)*. It is undertaken by the OUNL and four Dutch polytechnics (universities of professional education): Hogeschool van Arnhem en Nijmegen, Fontys Hogeschool ICT, De Haagse Hogeschool en Hanzehogeschool Groningen. These five partners are responsible for the development of the NOH-I. In the stage of the actual exploitation, after the start-up period, the network will be open to partners with added value to the consortium.

The program of NOH-I is directed at obtaining start-level qualifications for IT-professionals at the Associate and Bachelor degree level in the field of IT-Service Management or Software Engineering.

B. K.U.Leuven Association

Since higher education is highly subsidized in the Flemish community, and students have to pay relatively small entrance fees, there was never a high pressing need for open education outside of the traditional higher education institutes. This was one of the reasons that the Dept. of Education chose to cooperate with the OUNL rather than setting up a Flemish Open University.

This also means that widening participation is not directly at the core of Open initiatives in Flanders. Rather, the idea for Open courses stems from the fact that the professors who write academic courses at Flemish universities are paid with public funds.

For about two years, a group of members of the ICT for Education council prepared a policy document on "Openness and Authorship in the integral Learning Environment". The document starts with the observation that the learning platform has gradually become an authoring environment where rich content is being created, both by teaching staff as well as scientific collaborators and in an increasing way the students.

Time for a reflection on how the university would manage those assets (8000+ courses), closed within the confinement of a Blackboard-based Learning Platform.

The document then outlines the value of Openness – Open Source – Open Access – and of particular importance in this case: Open Content. K.U.Leuven is a subscriber to the Open Access Declaration,

which focuses on opening up scientific output. But much of what is produced in the context of Teaching and Learning at the university does not find its way into papers in academic journals. While the latter are highly specialized, undergraduate teaching addresses more broad, fundamental scientific issues that are more the domain of handbooks than of papers.

In this sense, there is a lot of deep experience and knowledge amongst the 1500+ professors at K.U.Leuven that is buried inside these online but not public e-learning courses that could benefit a broader audience. The document then lists a handful of “Good reasons to adopt OER”, and to make the effort of preparing a subset of the Blackboard courses for public release.

This document has been submitted to the University Education Board and has since been approved also by the Academic Council as a University policy. It has been introduced in the ICT strategic plan.

KULeuven is a subscriber of the Berlin Declaration on Open Access, and has the ambition to join the OCW within 3 years from now. A European-funded project with this aim has been introduced – and granted - together with Universiteit Delft.

The organizational level at which OER is being implemented is the K.U.Leuven University. In a second phase this will be opened up to the Association. As for the Project members' ambitions for OER policy in their respective institutions: the project member is the author of the original policy documents. Its stated objectives are to deploy open courses from K.U.Leuven. In particular we are aiming at web lectures, for which there is strong enthusiasm with professors throughout K.U.Leuven.

The current project is very important to strengthen our case for Open Courseware. The examples set by Open Universities should inspire K.U.Leuven policymakers to bolster their ambitions to OER.

At the moment the discussion is at the University level, not yet as such at the Association level. Since however the stated policies aim at enhancing collaboration within the Association, the discussion will be brought to the appropriate level once the University policy is clear.

Currently a project has been funded to produce 5 open online courses in a two-year timespan starting in the fall 2011. The 5 courses are chosen for their exemplary function: they exemplify different types of content, audience, and underlying pedagogy.

The goal is to make templates that later can be used for a larger-scale production of open courses on the basis of the existing courses in the closed e-learning environment.

In the two-year pilot phase, the different components needed to standardize production of open courses will be setup, making sure they integrate well in the university's core IT infrastructure. We will start with the following courses:

- A course in “Technology and Society” from the Engineering Faculty for a broader non-specialist MA audience;
- A University-wide course “Lessons for the Twentieth Century” covering current research in a broad range of disciplines
- A course on “Learning and Teaching” at the MA level for teacher training
- Modules on Web Literacy for courses on Online Publishing and Videoproduction
- Pentalfa: a series of postgraduate courses in biomedical sciences

The whole idea of the project is to come to an infrastructure, templates and pedagogical models that allow the large-scale deployment of Open courses with the K.U.Leuven Label. They would be published online in a specially branded series, and would rely heavily on weblectures and interactive exercises. If the pilot succeeds in offering good results, a decision will subsequently be made to promote participation in the series by professors of the University and the University Association.

C. UOC

Official policy documents

There are no documents detailing such policy. A document called Director Plan for Learning Resources it's coming nearly, but we don't know exactly when yet. We hope it will be ready in late 2010.

International Open Access policies or OER initiatives

The UOC is a member of the OCWC (OpenCourseWare Consortium). We are members of the Universia OCW project too, a consortium of Spanish speaking universities.

Organizational level

OCW is managed by the learning resources management department, directly under the Vice-Director of Academic Planning, but the responsible for the OCW is reporting to the Vice-Director of Technology. This Vice-Director is the contact person for OCWC and Universia.

Ambitions

We hope that a new policy about OERs which promote a use of modular, reusable OERs, instead of the three hundred pages manuals we are currently using. We hope also this policy will promote the use of open licenses for a great part of our learning resources.

The impact of the university on the society can be greatly increased thanks to the OCW project. The authors can share the learning resources using the OCW site and open licenses, and then use them in other educational institutions for teaching purposes.

2. Approach towards Open Courseware implementation

In this chapter, we will describe, for each participating institution, the different aspects which have to be addressed to enable Open Courseware implementation: what are the main hurdles to overcome, and which environmental conditions are deemed contributive to OER implementation. We will also identify threats.

1. Pedagogical

Starting from a description of Institutional educational frameworks, we will evaluate if the chosen educational model is appropriate for OER.

A. NOP-I (OUNL)

Pedagogical model

The educational design of the NOP-I is derived from good practices of undergraduate education and extensive experience in lifelong learning of the partners involved in the NOH. Students enroll in the program for a semester and may - after completion of that semester - stop, interrupt or continue the program. Supported by a continuous line of professional development, students may obtain an Associate or a Bachelor degree in computing after three or six semesters (Bakker & Janssen 2008; Bijlsma, 2009; Bijlsma, de Vrie & Schuwer, 2009).

The curriculum is built out of separate semesters that concentrate on a single theme. The semesters can each be taken separately and lead to their own certificate. Every semester contains both theory and practical competences. Both are applied immediately to authentic business cases coming from the students' own professional practice. A suitable combination of achieved semester certificates leads to a bachelor degree, or associate degree.

The teaching method will be a combination of several complementary techniques, viz.

- Face to face tutoring, plus lab sessions and feedback on assignments. These will be available at several separate locations; locations may be mixed during a degree course;
- A working conference after every semester;
- Digital learning environments comprising cooperation facilities between students (shared documents, video conferencing, text chat, asynchronous discussion groups), virtual classes (including full duplex audio, video, whiteboard, presentation software, session recording, document uploading, application sharing), facilities for personal supervision and coaching (e.g. portfolio management);
- Learning at the workplace.

The study materials will be composed of books, papers, software, supplementary reading, planning aides, exercises, assignments, classes, etc. The materials will be developed initially and updated yearly by teams from all participating institutions. Except for copyrighted materials purchased from third parties, all materials will be offered in the form of Open Educational Resources, under the Creative Commons license. This means that they will be freely accessible to anyone, including students and teachers at other institutions, and may be used for any non-commercial purpose. It is

hoped that the user community will play an active part in further development of and addition to the resources.

B. K.U.Leuven Association

We are now in a new phase after many years of efforts for *guided independent learning*, where considerable funds were freed to help professors design courses in such a way as to stimulate self-study. This relied heavily on the use of e-learning tools, for which a comprehensive university-wide platform, called Toledo and based on Blackboard and Question Mark Perception was introduced.

Current university policy doesn't stress as much the independent learning any longer but rather emphasizes a more holistic approach called the "integral learning environment". In this concept, the whole institution is re-centered as a learning organization. It has to be structured in such a way as to create a stimulating learning space for the students, whether this space is physical or virtual. Of course, this aligns with the transformation of the monolithic university into a completely different organization now involving 13 institutions for higher education dispersed over the Flemish region in a multi-campus setting. The institutions do each have their own pedagogical models, highly adapted to their disciplinary fields of research and training, local traditions and specific profiles, e.g. competence-driven or inquiry-based teaching and learning.

Anyway the attunement of the virtual and the physical (learning) environment will come to new heights with the Agora-project that is currently being deployed, where a large study landscape will be build at the Humanities Campus. We foresee much more student-driven approach capitalizing on social software, mobile computing, virtual mobility and high-intensity use of multimedia.

Since the K.U.Leuven Association is a quite large undertaking with 13 institutions that are regionally spread throughout the Flanders region and provide widely varied curricula, there is not one specific pedagogical model that is imposed. This means courses can vary from competence-driven over inquiry-based to more traditional lectures. We aim to provide sufficiently diverse templates to cope with this diversity.

The multi-campus aspect is important here, since the different campuses also stand for different learning objectives and differences in regional embedding. The virtual campus to which the Open courses will belong is precisely meant to allow for hybrid student groups, that are each taking part from their own perspective and regional background. This also means that the same piece of OER material can be used in one context for a more academic, lecture style teaching for a larger group, while at the same time being used in an inquiry-based, hands-on setting for a small group of students. The University has positive experience with this in the field of physics and electro mechanic engineering, where students from both the university and institutions for higher education were sharing course materials offered by professors working in cross-institutional teams.

C. UOC

E-learning is based in the interaction between teachers and students in the virtual classroom. Perhaps, virtual classroom is an obsolete term for an obsolete way of learning, but is the only way we know until today with a demonstrate effectiveness.

The learning resources are an important element for learning support. It's easy to view the resources like the center of the learning activity. This is a false perception, but is supported but the fact than a

vast majority of subjects have a single handbook which contains the base of knowledge for the subject.

The first step to OER effective use is to break these monolithic books into modular contents, and the use of an increasing number of external resources. This will increase the complexity of the content management in the university. Can we afford this?

UOC is a fully on-line university. Students find whatever they need in the Virtual Campus (<http://cv.uoc.edu>) of the university, from administrative procedures to proper teaching and learning.

All university life takes place at the Virtual Campus, comprising students, teachers, researchers, collaborators, and administrators. Students access to their virtual classrooms where they meet teachers, classmates, content, activities and communication tools necessary to study and learn. Any student is accompanied for a teacher of the classroom times that offers guidance through the educational process.

The evaluation is integrated into the learning process in the sense that it is conceived as a mechanism for learning and feedback process. Therefore we say that assessment is ongoing and training. In this sense, evaluation activities promote the achievement of learning. In this way the student was evaluated while performing its activities and acquiring their skills.

Learning materials

Students have continuous assessment tests. Typically, each cycle of the process consist in reading a chapter and just after to solve a few exercises. All the process is guided by the teacher.

UOC send all the required books before the beginning of the lessons to the house of the students. Typically these materials are books witch. The right of these books belongs to the university. Other versions of the contents are available at the virtual classroom: mobipocket, epub, html, pdf and audio.

The materials not only are important within the learning process. The institution considers them a strategic asset. There are two main reasons for that. Firstly, the exclusivity of content is a way to differentiate commercially the UOC courses from what other universities offer. And secondly, the materials are economically part of the assets of the institution. They are regular part of commercial joint ventures.

2. Technological

Each institution will look at OER starting from its own basic technological choices. In this chapter, we will start with a description of the institutions' technological framework, the main choices made, to then discuss how OER initiatives can fit in. Of course, since it all are multi-campus efforts, sometimes a very diverse or even quite divergent technological background setting will be at hand.

In particular, we will look into the e-learning environment, the backbone ERP system, the database technology, and the place of Open Source technologies in the institutional context. We will then make explicit the technical choices made at the institutional level to support OER.

A. Open Universiteit Nederland

This paragraph is based on Hermans & Verjans (2009), Schlusmans (2009a) and Schlusmans (2009b).

The Open Universiteit has been a frontrunner in using electronic learning environments (. In 1997 it developed its own virtual learning environment; know within the institute as “Studienet”. When at the turn of the century commercial VLE’s were introduced, there has been a long discussion whether it is wise to keep up an own VLE. Faculties became dissatisfied with Studienet and started using their own solutions. In 2005 it was decided to make the transition to Blackboard as the main application within Studienet. It serves as a student portal as well as course management system. Recently, Moodle has been added to Studienet as an alternative course delivery system, specifically for more interactive course tasks. Certified testing and examinations are to be handled by Question Mark Perception. Studienet also contains a variety of dedicated tools and utilities that are being used throughout the organization. Next to Studienet – which is a closed environment – the digital environment consists of the corporate website of the OUNL (www.ou.nl). Studienet and the corporate website are separate web environments, only connected through a series of hyperlinks.

At the end of 2007 the OUNL had an extended institution-wide strategic discussion concerning the future LMS approach and it was decided to draw up a new roadmap for electronic servicing of students and staff for the next period of seven years. Key starting points in this new approach is that it should be taken into account that (1) people/students have different aims, needs and preferences and that (2) people/students have different learning and working environments. In the long run Studienet should evolve towards an integral part of the corporate website and no longer exist as a separate environment. The corporate website has to serve as the institutional portal with personal workspaces for registered users, giving access to all relevant information and information services with maximal personalization. The basic idea is that in the future the student is in control and he/she both wants to and is able to largely determine for himself/herself how he/she wants learning materials to be provided and with which degree of quality, which supervision and assessment services he/she wants to utilize – at both programme and course level – and which technological environment/environments and applications he/she wishes to use for organization, communication, and information. The large majority of OU students also has a job, with the associated ICT-based working environment, and wants to be able to integrate what the OU offers into that working environment.

For the Open Universities the adoption of this concept of a personal learning environment instead of an institutionally managed learning environment poses a great challenge: it involves not only the delivery of study programs and materials, but the entire OU organization, logistics and technology. From the technology point of view, the institution needs to reorganize its ICT services and content in such a way that they may be provided as flexible, “pluggable objects” that can be included in various technological environments. This implies shifting from thinking in applications towards thinking in services. It also means rethinking the ICT architecture and moving towards a more open model. In fact, it involves operating on the basis of a properly thought-out design and not on the basis of ad hoc decisions and facilities.

The aim is sustainability and the ability to keep pace with new developments, for example in educational theory or technology. It also means maximally sticking to open standards, as the content and educational services have to be interoperable to have them integrated or running outside the institutional environment. Content and presentation need to be separated as much as possible in order to allow for flexible delivery through different communication channels. The student can decide himself /herself whether to read a text online, either on a computer screen or a Smartphone, to download it as a PDF and read from an e-Reader or have it printed in the copy shop around the corner and read from the printed version. This implies completely new workflows and tooling for content production and management.

OUNL-NOP

In 2009 the Board of the OUNL has decided that higher professional education will be the second real, of open higher education alongside science-based higher education. In The Netherlands there is a two-tier system of higher education with on the one hand the science-based universities with bachelor-, master and doctorate programs and on the other hand the polytechnics or universities for professional education (‘hogescholen’) with predominantly bachelor programs and to a far lesser extent (professional) masters. The way in which OUNL is going to develop programs in higher professional education is by making (changing) alliances of OUNL and polytechnics, producing a national HE infrastructure for lifelong learners. The outcome, then, is by definition a multi-campus HE-model.

The motives of OUNL to start this national network and to participate and to cooperate are:

- Partnering in open innovation in lifelong learning innovation
- Sharing of costs of development of new mode of LLL-education
- Sharing of costs of development of high quality materials adapted to lifelong learners
- Sharing of costs of market penetration
- Branding of a new mode of LLL education (competitive advantage)
- “Creative destruction” of existing models of lifelong learning education

OER is one of the distinguishing features of the NOH-model. The production of OER is integrated part of the overall business model of NOP-I.

These are the requirements for the development and (re)use of OER:

- In principle all educational resources for all semesters will be OER
- It must be possible to use annually fixed versions of OER based programs
- Public must have access to “fixed versions”
- Students, staff and public must have access to all resources in order to submit reviews and ratings, comments and suggestions, additions and improvements
- It must be possible for staff to add user experiences
- Monitoring and blocking of rude behaviour and copyright violations
- Central and decentralized databases

For the NOP-I a mix of e-tools will be used, mostly open source software tools: VLE (Moodle), virtual classroom tool, lecture capturing tool, tool for assessment of prior acquired competences, tool for online evaluation and various social software tools . the Wikiwijs-technology and platform will be used (Wikiwijs, 2011).

B. K.U.Leuven Association

The technological framework is currently at the very core of the discussion on OER at the K.U.Leuven University. Let's first describe what we have:

The Toledo Learning environment

The Learning environment consists of a Blackboard 9 solution on Oracle databases, a QuestionMark Perception survey and Assessment tool – now in the process of being partially replaced by a Limesurvey server -, Turn-it-in Antiplagiarism Management, and Mediawiki and WordPress software.

All these different components are integrated with the SAP Campus Management back-end through an intermediate layer of IMS-compliant Oracle databases. A unified Shibboleth AAI infrastructure provides single sign-on facilities.

The whole Toledo-environment is managed as a whole and optimized for very large scale use, with more than 75.000 registered active users and >35.000 different user logins each day. It is a multi-campus solution serving 13 institutions for higher education throughout the region. Currently, an SAP project called "Corona" is underway to also unify the underlying administrative databases of the involved institutions.

Several integration efforts with the library system are ongoing (through SFX-technology), and we also have a multimedia streaming server (QuickTime and Flash technology) to embed video and audio. Each student can start a blog or a wiki on the system, professors can integrate wikis and blogs directly in their Blackboard courses.

At a decentralized level, also other systems are used, in particular Moodle for the LACE-project at the Arts Faculty. We use Moodle as an elegant tool to provide Open Courses.

For the implementation of the Educational project "Open Courses K.U.Leuven" we plan to deploy a Plone web-environment for the course pages, together with using our mediawiki and WordPress blog environments. But at the same time possibilities are explored to run a second, open Blackboard system setup specifically for the open courses.

C. UOC

Due to its very nature, the UOC has a large technological infrastructure. Here we just highlight a few items related with teaching and learning. The Virtual Campus (<http://cv.uoc.edu>) is the institutional LMS. It consists of several modules. The main ones are:

- The education portal. It's a widget's container. There are different default configurations but any student can decide what to see there. Most of the widgets summarize a particular piece of the virtual campus. For instance, a widget displays the delivery dates of assessments; another shows the number of messages pending to read. The whole system is developed from scratch and uses a standard OKI architecture.
- Classrooms. Is where the teaching and learning takes place. The teacher is able to add forums, calendars, file areas, wikis, and blogs. There's also a list of students, links to educational materials, exercises.

The repository of open content (<http://openaccess.uoc.edu>) gathers all the documents that teachers and students want to publish under an open license. There are final degree projects, papers, assignments statements, etc. The service uses DSpace.

OCW (<http://ocw.uoc.edu>) contains all the materials published by the University under an open license. Nowadays you can find more than fifty books that correspond to the same number of subjects. The service uses EDUCOMMONS as a base application.

3. Organizational

OER involves an institutional approach on both IT and Education. But it also has an impact on regional embedding and the way institutions cope with multicampus environments. These

organizational issues will be dealt with in this chapter. We will take an approach from IT governance: who makes decisions? What are the procedures to come to those decisions? Who looks after implementation? How are IT- and Educational policies matched? What opportunities and/or hurdles stem from the institutional organizational context?

A. Open Universiteit Nederland

The strategic aim of the Open Universiteit, formulated in 2006, is to become a digital university in which the internet plays a major role in all educational processes: “At the end of 2009 the Open University of the Netherlands offers high quality, flexible, open distance education which is to a large extent web-based and which uses to the full the opportunities the Internet offers. In doing so the Open University becomes a key player in e-learning.”

In order to achieve this transformation, in 2007 it was decided to start a central, over arching educational innovation program for the duration of three years (Schlusmans, 2009b). This program ran across all departments and its program manager reported directly to the Board. The aim of the program was to focus the innovation activities, to strengthen e-learning in all departments and to achieve cooperation between faculties and departments. Projects in the program were the implementation and change of the Virtual Learning Environment, the introduction of ‘the virtual classroom’, the implementation of online testing, the further digitalization of educational materials and the implementation of several quality assurance instruments.

The program was positioned across faculties. The program manager had been nominated by the deans of all the faculties and is appointed by the board. In the program office a financial advisor and an office manager looked after the administrative and financial side of the program. A steering committee of representatives of the deans of the faculties and the head of departments advised the program manager and all major decisions about the program were discussed in the steering group meetings. There was also an advisory student group who met twice a year to advise the program manager on the content of the program and to discuss the major problems students at the Open University encounter and how the program can help to solve those.

The program was broken down into several interdependent projects. Each project had got a project leader who reported to the program manager. The project leaders and the people who worked in the projects were all staff members of the faculties or the departments, most of them worked only part time in the program.

Each project had got its own supervisory group. The members of these groups were recruited from the faculties, the departments and the student body and they were the ambassadors of the project. They reported on the problems faculties encounter and reported back to their faculty or department about the results of the projects and they advised the project leader and the program manager about all issues concerning the project.

A central fund of 3 million Euros was put aside for the program. Moreover it was agreed that a considerable number of staff members of the educational technology department and the ICT-department would participate in the program without additional funding. Faculty's and the services department received extra funding based on their actual input in the program as an incentive to participate. All external expenses and the cost of the program management were paid for by the central fund.

B. K.U.Leuven Association

The K.U.Leuven and its Association are in the midst of a process to completely overhaul IT governance, both from a compliance point of view as well as driven from an association-wide, multi-campus approach.

In a first step, a new Strategic Committee has been put into place, which involves the University leadership and representatives from the Associated institutions. In this committee, a strategy document on ICT in the K.U.Leuven Association will be set up.

The current Advisory Council on ICT and Education has the explicit goal of matching ICT- and Educational Policies. Where it previously was composed mainly by technical ICT people, education experts and several Expert Faculty members, it now has a more representative composition involving people delegated by the 3 groups (Biomed, Science & Technology, Humanities), and representatives from the partner Institutions. In this way it effectively merges with the current CDLP committee (Gemeenschappelijke Digitale Leeromgeving or Common Digital Learning Platform) at the level of the Association.

Policies involving Open Education Resources are currently discussed at the Advisory Board level. The fact that the Leuven project member is also member of this Policy Board is of course an opportunity to put OER on the agenda.

In practice, most of the multi campus applications are developed and supported by 'The Media and Learning Unit', a central service unit for improvement of teaching and learning by using audiovisual and new educational technologies. The Media and Learning Unit also coordinates or participates in research, development and implementation projects related to the use of multimedia in higher education. Themes such as multimedia support for increasing flexibility and internationalisation are central to these projects. The unit is also committed to exchanging knowledge with developing nations (ICT4Development). The projects are both European and regional (university, association, Flanders) in scope. The Media and Learning Unit takes a multidisciplinary, integrated approach. The problems for which they offer support and provide solutions require attention at the media-specific, educational, technical and organisational levels are:

- media-specific: The Media and Learning Unit has expertise and pays a lot of attention to what are quality images and sound fit for education and other communication processes at our university.
- educational: The Media and Learning Unit services are embedded at all levels in the educational concept of the university.
- technical: The Media and Learning Unit follows modern trends in ICT, educational and learning technology, multimedia and new (e-)media.
- organisational: The Media and Learning Unit looks for optimal models in order to combine the different parties involved in the learning process (learners, learning resources, lecturers, etc.) into a systematic entity that works together effectively towards the desired goal (e.g. networked e-learning in an international context).

One of the core businesses of The Media and Learning Unit is multi campus education support, with the following technologies:

Video conferencing

Video conferencing brings groups of people who are separated by large physical distances into live contact with one another. It is ideal for following lectures or meetings remotely. Video conferencing

makes use of audiovisual communication technology to bring people into live contact with one another. It can be arranged between two (point to point) or more (multipoint) locations. Video conferencing features an extensive range of possibilities for interaction and collaboration, each with its own dynamic. It is eminently suitable for both educational uses and remote dialogue. Examples include (international) seminars, lectures by guest speakers given at another location, group work, thesis defenses, the conduct of examinations at a distance, doctor-patient consultations, live coverage of events or conferences at a distance, live remote visits to museums, exhibitions or inaccessible sites. K.U.Leuven has various locations with video conferencing facilities, ranging from meeting rooms to auditoria. The Media and Learning Unit also has mobile installations which enable video conferences to be set up in any room with an internet connection.

VideoLAB

With streaming media, audiovisual material can be made available via the web quickly and easily. K.U.Leuven provides its VideoLAB streaming service for education and research purposes. Streaming media is a technology which enables multimedia to be viewed and listened to on the web quickly. It is no longer necessary to download the entire file before you can watch the video, the display starts immediately. The material (the 'stream') may be live, for example a video conference which can also be followed via the internet, or it may be a programme which was recorded previously. In the latter case the term 'on demand streaming' is used. With streaming media, audiovisual material can be made available to your public via the web quickly and easily. The Media and Learning Unit offers members of the K.U.Leuven Association a streaming service for educational and research purposes. With VideoLAB, multimedia can be put online as streaming video or audio quickly and easily via an own website or within the learning environment Toledo. It is very easy to upload video material from a PC to the server. VideoLAB converts the uploaded media and provides a link that can be included in a web page or in Toledo to access the stream.

Web2.0

The term web2.0 is often used to denote a new trend in the development of the World Wide Web. Instead of static websites, increasing use is being made of dynamic and interactive web applications which rely heavily on user-generated content such as wiki's, blogs and social networking sites. Networks and communities often emerge from these. Websites based on images, sound and interactivity, such as YouTube, Flickr and Wikipedia, are playing an important role in this development. Web 2.0 technologies are certainly useful in educational environments. Social networking sites, collaborative tools and online suites make group working and collaboration at a distance possible, help build networks and are a useful instrument for encouraging peer assessment among students. In this context, terms such as Learning 2.0 or Classroom 2.0 are used. The Media and Learning Unit specializes in using social software and especially the link to (quality) image and sound in an educational context.

Screencasting

Screencasting software makes recordings of what is happening on a computer screen. For example, screencasts are the ideal way to explain the workflow of a program or how to search electronic databases. Screencasting software makes a recording of everything people do on the computer screen together with an(oral) explanation. The tools are simply a PC, a microphone and screencasting software. The outcome can then be uploaded to VideoLab or made available as a Podcast. Both paying and free open source screencasting software is available for making screen recordings.

Web conferencing

Web conferencing enables small groups of students or colleagues to work together and communicate. It is ideally suited to group working or seminars. Web conferencing is a form of telecommunication between different locations, via the internet. In a web conference, each

participant at the meeting, presentation or training session sits at a computer and is connected to the other participants via the internet. This requires a downloaded or web-based application on all the participants' computers. Using this application, the participants can take part in a conference involving chatting, but also communicating with images and sound via a web address.

Web conferencing differs from video conferencing in terms of quality, number of participants and complexity. It is cheaper (sometimes free), highly accessible, quick to start up and it needs little equipment. A webcam, a microphone and a web-based (Adobe Connect, WebEx, Microsoft LiveMeeting) or stand-alone (Skype, MSN, AOL Instant Messenger) application are all that is needed. However, web conferencing is restricted in terms of number of participants, and depends on the quality of each participant's internet connection. Video conferencing enables a higher picture quality to be achieved, usually involves a more stable internet connection and has the capacity for greater student numbers. However, professional equipment and support are needed for video conferencing.

In an educational context, web conferencing is very suitable for small-scale discussions among lecturers, policy-makers or students at a distance. With participating numbers of under ten (without images) or under six (with images), communication can be achieved without any problems. For participating numbers of more than ten, video conferencing is recommended. Like video conferencing, web conferencing permits an extensive range of interaction and collaboration possibilities. Both are highly suitable for educational applications and for remote dialogue.

Some examples:

- Discussions relating to European projects
- Remote examining
- Remote internship supervision
- Virtual consultation sessions in connection with an Erasmus exchange
- Thesis defence

Web lectures

A web lecture is a lecture which is recorded and then made available to students via the internet or a digital learning environment. A lecture can be published in full, or the lecturer may opt to make cuts to the recording and only publish the lecture's highlights. In a web lecture, the video images can be presented together with the supporting materials that were used (PowerPoint presentation or document camera). It can be useful in these cases:

- Some students cannot necessarily attend a compulsory lecture in person – for example students with a full-time or part-time job, exchange students (Erasmus), disabled students, top sports players or artists, or students with overlapping lecture obligations.
- A web lecture can also be useful for regular students, since watching it again can help them to process the material.
- Web lectures offer the lecturer new possibilities with regard to the set-up of a lecture or seminar. For example, certain recurring concepts can be included in a recording and made available via the learning platform. The lectures themselves can then focus on discussion, interaction or exercises based on the recordings.

Podcasting

Podcasts can be used to put audio or video files online quickly which can then be downloaded by users automatically. Podcasts can easily be recorded using the built-in microphone on a laptop or PC, and after some editing they can be put online. Podcasts are thus ideal for giving brief explanations about frequently asked questions or problems, and can be distributed via Toledo, iTunes or other channels. Podcasts can also include video and screencasts. In this way, computer programs such as

Matlab or search strategies in K.U.Leuven or LIBIS databases can be explained quickly.

Source: <http://www.dml.kuleuven.be/english/Multicampus>

C. UOC

The UOC is headed by its Chancellor and four vice chancellors. Two of them, the vice-chancellor of academic technology and the vice chancellor for academics, are particularly involved in the management of the learning materials. They propose the policies of use that are after approved by the governing council.

Currently UOC uses open licenses as well as copyright. The first received an important boost thanks to the support from the Catalan Government who cares that the budget injected in an institution is reused by others. Licenses keep that door open. It was the case of the Alchemy project, a shared initiative of UOC and the Government of Catalonia. The project founded much of the books that are at the Open Course Ware (<http://ocw.uoc.edu>).

There are three departments involved with resources. Learning Resources is the group responsible for supporting teachers in all that has to do with the recruitment of authors and the subsequent editing of educational content. Upon recommendation of the Council, apply only two kinds of free licenses: Attribution-NonCommercial-NoDerivs and Attribution. Staff of the library maintains the institutions repository. Learning Technologies department supports both, Library and Learning Resources.

3. Development Plan

In the development plan, we will describe the detailed roadmap in each institution/network in regards to implementation of OER in a multicampus context, for a 5 year period. We will clearly describe, both in quantitative as well as qualitative terms, what we want to achieve at certain assessment points within the multicampus network, and try to formulate clear benchmarks to identify success.

A. OUNL- NOP

The ambition of the Networked Open Polytechnic (NOP) is to develop a national, open and flexible infrastructure for higher education in the realm of adult education, leading to many extra diplomas per year. NOP will offer programs that will appeal to large numbers of professionals and their employers. Furthermore, students should succeed in completing the program. Base elements in the programs are use of professional experience of the students in semesters, blended learning, a modular curriculum consisting of semesters that are directly relevant to the professional practice, active learning communities and high-quality educational resources that will be publicly available and open to modification (open educational resources). The NOP initiative aims at new methods for teaching professionals that will have a higher success rate than the methods used before.

The unique properties of the NOH through which this is to be achieved are:

- Customization through workplace integration and recognition of experience,
- Modular construction from independent semesters,
- A nationwide network of teaching locations (that may incorporate even more in the future),
- Internet-based cooperation and coaching,
- Cooperative development of Open Educational Resources.

The ambitions of the NOP-I are to provide, eventually, 1000 semester certificates a year, 150 Associate diplomas per year and 50 Bachelor diplomas per year. The semester success rate after 1 year is expected to be around 75%.

The NOP- I is scheduled to start in September 2011.

B. K.U.Leuven Association

The educational council of K.U.Leuven University has decided to adopt a policy for open content in July 2010. The proposal involves the publication of an open series of K.U.Leuven-branded courses, by using existing technology within the institution. Sufficient funding will be provided in a start-up phase to publish a series of 10 selected courses. The whole idea is to select courses with broad impact and publish them online as complete courses involving exercises and self-tests. Candidate courses have to be proposed by a study curriculum committee. Professors who want to publish a course in the series will get technical and pedagogical support to develop the course in all relevant aspects.

Within the education council, a group will be formed that will act as a quality support group and editorial board, to ensure courses in the series are of outstanding quality standards.

The K.U.Leuven hopes to join the Open Courseware consortium on the basis of this series when sufficient courses are available online.

This initiative is part of a strategy to improve the impact of University teaching, both within the University association itself as in the broader Flemish region. The motivation for this stems from the need to bring new scientific insights sooner to the stakeholder communities. The Bologna process already invites higher education institutions to tighten their links with research and to make sure higher education content is based on current research.

To this end, the K.U.Leuven will promote content collaboration amongst the thirteen member institutions within the University Association. This will be achieved by maximizing the use of the existing state-of-the-art e-learning platform, which holds many opportunities for professors to collaborate in multi-campus settings. An extensive document detailing possibilities of student and professor collaboration has been compiled, and will be promoted through short training sessions in the faculties and institutions. Since all students in the association (75.000+) are registered in the same database and have access to the same learning platform, we will encourage multi-campus setups where students at different locations will take in part the same course, hosted on the e-learning system and tutored by a mixed team of professors from both the university and the involved higher education institutions.

In a first phase this will be achieved by using courses that are within the confined space of the closed association learning platform. Of course, international students and external professors can join in but only after a registration. This is because the Belgian legislation allows the use of copyrighted materials under certain conditions in a closed virtual classroom situation. Many of the 8000+ courses therefore contain copyrighted third-party content which prevents us to open them up as such as Open courseware content.

This is the reason why we opt for a specific approach to Open courses, where we will create a new series of courses especially for the "Open" market. The idea is that these courses will take extra effort because they will rely less on third-party materials and mainly contain genuine K.U.Leuven content, of course to be enriched by existing Open content following a share alike principle. The courses will be published under a Creative Commons licensing scheme.

It is our stated goal that this new series will be a top series both locally and internationally, and will be a reference for the thousands of courses that are now within the e-learning platform, exemplifying both technological innovations, new pedagogical approaches as well as exploiting the virtues of open policies.

At this very moment there is not yet a concrete planning: first, a project leader has to be appointed. His task will be to organize the support structure for the course development. In most cases, the course materials already exist, both in printed form as well as on the Toledo e-learning platform. The materials have to be cleared for copyrights and possible copyrighted drawing and images need to be replaced, if possible by newly created ones or similar drawings/images that can be found in the public domain or in open repositories such as the Ariadne KPS.

The project manager will be able to rely on specialist teams from both the university's Media and Learning Unit audio-visual support centre and the ICTS general ICT service. For the moment, instead of deploying Open Courseware software to host the courses, it is preferred to implement them using the existing Plone CMS and both the wiki- and blogservice of the university.

C. UOC

UOC is working on a new Strategic Plan for 2010-2014 that includes a chapter for OER. The results will be delivered on October 2010. The next lines are the first draft of the proposal.

Analysis of the present situation

Currently, the Universitat Oberta de Catalunya (Open University of Catalonia, UOC) uses a great number of original self-developed resources, as opposed to other external resources. These external resources are, chiefly, journal articles or book chapters.

Statistics

The first difficulty for evaluating the present situation is the lack of reliable data and valid indicators for comparison. It is evident that it is not sufficient to compare the two elements merely in terms of quantity: X self-developed resources and Y external resources. Rather, it is important to know how many credits of each subject are covered by resources of one type or the other.

Secondly, regarding the external resources being used, we must be able to determine which of these can be considered OER and which simply complementary reading materials are. In order to do so, we must clearly understand the distinction between the two types of resources and categorize all of the resources in use at the university.

Attitudes of Professors

The statistics suggested in the previous point should provide an accurate picture of the use and exploitation of OER in our university. If these statistics, as we believe, confirm the scant use of this type of resources, it will then be important to analyze the attitudes and work habits that must be modified to increase this use. For the purpose of discovering these attitudes we propose creating focus groups with a sample of professors. The objective of this experiment is to ascertain why a professor, when choosing course material, chooses the option of elaborating original material instead of reusing existing material. The experience should confirm or refute some of our hypotheses:

- Creating original material involves fewer hours of dedication, since the main part of authorship is undertaken by external professors, while the selection of materials for reuse must be done by the professors themselves.
- The professor believes that the university policy is to produce original material as a differentiating element of quality with respect to other universities.
- The professor believes that the subject material must include all assessable contents and must serve as a guideline for carrying out all continuous evaluation tests.
- The professor sees the authorship of new materials as an alternative source of income, for them or their circle of collaborators.

Attitudes of Students

We must also study the perception held by students of the use of external resources in subjects. There is the belief that the university materials are highly valued among students. How would they react to a change of model toward a much more extensive use of external information resources? Therefore, we will also create a focus group with students to determine which aspects must be taken into account when making this change.

The ideal situation

The policy of open resources being adopted by universities must have a return. In other words, the fact that many universities are opening their contents has to result, in the long run, in all of them spending less money on creation of new contents.

Therefore, we believe that it would be desirable to reach a level of original materials for each subject that would cover no more than 20% of the credits, and which should give coherence and integrity to the 80% of external resources. These could be either OER or reading material (articles and book chapters).

Impediments

To arrive at the ideal situation we have described, we may run into a series of impediments, which we will examine below.

Dominant position of the provider

The main providers of content for our university are authors. Professors commission the creation of content and ensure its quality, but in the majority of cases external authors write the contents. These external authors have, in some instances, a predominant position over the university, and can impose their own conditions. For example, they can refuse publication of their contents in open source.

Lack of comprehensive policies

We must have, at the university, a comprehensive policy with regard to contents, as opposed to a policy of exception and differentiated treatment that creates a series of particularities that are very difficult to manage and regulate.

Business model in question

There is a deep-seated belief in some sectors of the university that its prestige is measured by the quality of its materials. It is in no way our intention to reduce the quality of contents, however, it is easy to confuse quality with brand, and it is feared that losing the second is perceived as a loss in the first. Put differently, a student who enrolls in the UOC wants to receive UOC materials, and if this does not occur they may feel deceived.

Management of diversity

In recent years the university had made an effort to homogenize the treatment received by our materials in order to facilitate editing, publishing, preservation and conversion to new formats. Specifically, we have been working on editing all of these materials in XML, and publishing them through a common database.

A situation involving majority use of external resources would require us to manage very diverse materials, which we would be unable to preserve or transform as we do at present. In this case, the preservation and transformation of materials would be the responsibility of the university or educational institution that created them, and to which we delegate part of our responsibility, in the same way that we would be responsible for the materials we create and that other universities use.

Within diversity we also include multilingualism. It can be as costly or difficult to translate material as it is to create it.

Change of paradigm

The role of professors is undergoing change. Instead of commissioning material to one or more authors, they must locate external resources and adapt these when necessary. This may involve more work than they had previously, something that must be avoided if we sincerely want to change the model. To this effect, we need to seek solutions, such as, perhaps, the creation of a department devoted to locating and adapting resources, or creation of a post for an outside expert for locating and adapting external resources, equivalent to the present commission of authorship.

Result

Lastly, introduction of this new paradigm must be reflected in a considerable reduction of the budget devoted to learning resources, although it is difficult, at the moment, to establish a specific savings objective.

Strategy:

Creation of contents

We must continue to create contents in those fields not covered by others. But this must be done differently: modular and decontextualized from the subject for which it was created. This would facilitate its reuse.

We must stop, therefore, creating textbooks designed to cover the entire syllabus of a subject, manuals of the type “what you have to know to pass this subject”. In their place, we have to create books that develop specific topics, that are limited in their scope, and which can be extrapolated to different spheres of knowledge and application.

Opening contents

A clear policy must be established for opening contents and reducing exceptions to a minimum, to reward, if possible, professors and authors who publish contents in open source, and measure the impact that these contents have externally.

We should assess the idea of establishing awards for the creation of quality contents, and also for adaptation of external contents or the overall contents of a subject. These awards must define the objective to be pursued by all professors.

Reusing contents

We must create tools that facilitate reuse of contents. To this effect, contents must be easy to find and easy to adapt. Therefore, it is necessary to work on the creation of repositories and search tools, and on creation of editing tools.

External contents:

Using open contents

The amount of original material that may be employed for a given subject should be restricted, limited to some 20% of the subject’s credits. In parallel, help must be offered to professors for finding alternatives to original materials in the ways previously mentioned.

Training

Both professors and students must receive training in the use of external materials. Professors have to be instructed in the consultation of repositories of teaching contents, and in the edition of materials using tools created by us for this purpose. Students must also receive instruction in the use of repositories to be able to go into greater depth in subjects they are interested in or in those that they have difficulties with. This training could be included in generic introductory subjects on the use of new technologies or digital literacy.

Benchmark

Flatworld knowledge is a referent that must be taken into account, especially in terms of reusing contents. The tools for editing and updating materials that we will have to create at the university could be similar to those proposed by this company.

4. Multicampus scenario's

In the most concrete part of the study, we will describe for each involved network which multicampus scenario's are possibly to be implemented, and we will look into possible common approaches to this specific multicampus problem, so as to be able to present a best practice case in OER multicampus implementation.

A. OUNL

An important, if not the most important, pedagogical design criterion for the NOP is the user perspective of the stakeholders involved, primarily lifelong learners. For these users aspects such as effectiveness, usefulness and reliability are very important. In selecting courses lifelong learners look at programs and courses in terms of:

- Is the program useful (e.g. for the career) and it is a solid program that fits well with my professional development?
- Can it be followed in combination with daily activities like work and family?
- Is the program feasible?
- Does it lead to a legally recognized certificate?

In answering these questions OUNL and partners have distinguished between the aspects of the content and the (pedagogical) form of the program.

From a user perspective it is essential that a program meets the professional development requirements as set out nationally and internationally. For the domain of Computer Science this implies at the national level the Dutch requirements as defined in the Handbook Bachelor of ICT (2009) and at the international level the requirements of the European e-Competence Framework (e-CF, 2011). Both sets of requirements have been taken as reference for the bachelor program.

As said earlier the traditional form of university education (mainly classroom) is not a suitable form of education in meeting the preferences of lifelong learners. A more flexible way of education is needed, in which the lifelong learner is central: from a learning 1.0 perspective to a learning 2.0 perspective (Verjans, 2011). To make this possible NOP has developed a model of 'blended learning' having the following characteristics:

- A national modular and thematic program that is identical for each of the 4 campuses
- A structured mix of classroom (face to face and virtual) educational activities and distance self learning activities. F2F is more suitable to start building communities (Mesanchunk & Anderson, 2001).
- Network learning, face to face as well as virtual (communities of learners)
- Use of Web 2.0 resources, amongst which social media, online content collaboration, online coaching and individual contact with the instructor, online social bookmarking, participation in online professional networks (like LinkedIn), and so on.
- All teaching materials are available online as Open Educational Resources
- Students make extensive use of their own work situation (learning materials are case-centered, where the cases relate to their own workplace).

B. K.U.Leuven Association

One particular 'good practice' example for multicampus education at the university is the Pentalfa project. It started off in 1998 as an initiative of the Faculty of Medicine and was extended later in cooperation with the Flemish hospital network. The Pentalfa project represents interactive postgraduate long distance education. The goal is to offer this postgraduate education of the Faculty of Medicine in Leuven in an interactive way in every region in Flanders. Therefore a connection is created through the most advanced devices for videoconferencing between Leuven and five different regions in Flanders, one in every province. This way, doctors can follow the same program each in their own region and from different locations spread around Flanders, and have a conversation with the other participants as well.

Each year Pentalfa provides a multidisciplinary program of diverse disciplines of Medicine. Pentalfa tries to contact a broad group of graduated doctors and/or experts from the public health sector. The sessions' subjects are very broad; from acute allergic reactions of children or complications in breast cancer therapy to malnutrition in hospital.

A rotation system defines which hospitals partake in which sessions. Overall there are 25 sessions every academic year that each take place on a Thursday night.

The educational quality is guaranteed by the scientific coordination group that composes the program. This group is formed by the representatives of the K.U.Leuven, coming from different disciplines of the U.Z. Leuven and the participating hospitals of the Flemish hospital network.

During each session four or five guest speakers, each of them specialists in their own discipline, give an interactive presentation. These presentations take place in the Pentalfa auditory in Leuven at 'Onderwijs en navorsing' on the Campus Gasthuisberg of the Faculty of Medicine of the K.U.Leuven. Sometimes a presentation can be organized from one of the guest locations. A central moderator coordinates the session. Each evening is concluded by a panel discussion between speakers and participants on all different locations that are put on screen by various cameras. This in order to grade up the interactive aspect. All of these discussions are coordinated by the moderators. The participants can follow everything through two video screens imbedded in one, one showing the speaker, the other showing the audience. Another screen shows visual aids like for instance PowerPoint presentations, graphs or movie fragments.

The whole session can be reviewed through streaming or podcast at home. A very convenient aspect, because when one has missed a certain session, one doesn't miss out on all of the information.

See: http://med.kuleuven.be/pentalfa/pentalfa_en.php

C. UOC

In practice, the UOC has two different campuses. The first one is only in Catalan. The fees are part subsidized by the Government of Catalonia. The other is in Spanish and the cost of the registration must be paid by the student entirety. Both campuses offer the same courses, but all resources are translated. This system can be considered multicampus.

A semi automatic system is used to translate the contents. Originals are processed by software. The software only supports some type of input formats such as PDF, Word or text. Professional translators review every single document generated by the machine. Unfortunately, the translation process undoes the layout, which requires a double edition of the text unless it is done using XML and a system that preserves layout.

5. Common Strategies

In this chapter we will outline how K.U.Leuven, NOP (OUNL) and UOC have learned from each other's approaches to formulate specific policies for the own institution that fit a common strategy and share a common understanding of the value of Open Educational Resources. This part can be read as a concise handbook for the use of OER as a tool to facilitate multicampus higher education.

It will define *basic principles of multicampus OER*, different *implementation options* learned from the *best practices* and *quality guidelines* to make sure a proper use has been made of OER, and will also review the *Creative Commons Licensing models* that best fit these needs.

A. Basic principles of Multicampus OER

OER can be implemented for a multitude of reasons, as our exploration in the three case studies will show. OER is a single solution to reach very different goals. The three institutions involved allow us a sneak peek into their inner decision making process on OER.

Life-Long-Learning

OER fit very well into the mission of the OUNL: it develops, provides and promotes innovative higher distance education of top quality, in collaboration with other HE-institutions in networks and alliances. As the Dutch prime university for lifelong learners, it addresses the wide-ranging learning needs of adult people during their course of life, plus the need to achieve a considerable upgrade of the knowledge level of the community at large.

OER may well be one of the instruments by which this necessary change and innovation can be achieved. Lifelong learning (LLL) should be enhanced in the direction of individualized mass production of resources in relation with social networks of individualized learners. New hybrid forms of both adult distance education and cooperative and collaborative learning are needed. The potentialities of OER may well be very useful in achieving this goal, all with different strategies and business models.

On the contrary, K.U.Leuven offers traditional, daytime education both at the University Campus as well as in 12 institutions of Higher Education spread through the Flemish region. A strongly developed E-Learning system, called Toledo, warrants a blended learning approach, offering both local branding possibilities as clear advantages of scale. The Belgian legislation offers possibilities to use copyrighted materials for educational purposes in a closed, subscriber-only learning platform, which is then equated with a classroom situation.

Both this legal situation and the fact that the thousands of courses in our Virtual Learning Environment (VLE) are meant for a blended learning context where a lot of information is passed directly in the classroom, makes that choosing for OER is not so evident. Understandably, the University seems still quite hesitant to embrace a true open policy: the focus is now in the first place on re-usable materials within the Association.

In July 2010, the Education Council of K.U.Leuven approved a policy document on OER submitted by the ICT for Education Board, inspired by our participation in OER-HE. This document outlines several reasons why the K.U.Leuven should venture into OER anyway.

Exposure

OER offer a possibility to strengthen the profile of both the university and the individual researcher and teacher. For the institution, it is the ideal tool to foster the local embedding in a community. With its openly published materials and results, universities are present in broader layers of today's information society, get picked up earlier in Google and make sure there is also higher quality content available for the users of web search engines.

There is also a clear advantage to the individual researcher. There is a difference between the research published in top journals, which as such is aimed at a small, highly specialized audience, and many other competencies of the researcher, stemming from his teaching or work in a lab. OER helps position the researcher in this broader field.

Mainstreaming

By distributing high quality learning materials in an open way, researchers help to mainstream new research insights. These materials can be used by teachers in higher education or at the secondary school level. This way, more novel views on topics can be spread faster amongst the learning community. Mainstreaming understood this way amounts to shaping the research environment. By mainstreaming their insights, researchers can foster interest in their research topic, and make a wider audience the wider principles and issues at stake. This has been shown many times in environmental and health research.

This approach is also beneficial to the internet as a whole, through a positive effect on web searches. The more universities provide reference materials on the internet, the better the search results internet users will obtain, as is clearly demonstrated by how Wikipedia articles show up in Google searches.

Internationalization and reaching out to stakeholder communities

Research is international as such, yet part of the mission of the university is a service towards its "constituency", its regional embedding. Internationalization is an effort to provide a link between the local communities and the international dimension. OER can be freely embedded in locale practices. They give internationalization a novel meaning, by enriching it with local perspectives. A lot of internet communities work on this principle: people share their views on open content online, while embedding it in very different practices and different contexts.

Quality insurance

Paradoxically, one of the reasons universities are hesitating to opt boldly for an open policy towards their learning materials, is that after review, many of the online courses on their e-learning platforms are not really ready for publication. First of all, these courses are often used in a blended context, supporting class teaching activities. Not all relevant information is on the web: there is a lot extra info communicated in the classroom situation. Second, a lot of third party materials on these closed e-learning systems is copyrighted. While it can be perfectly legal to use them in a closed e-learning environment, the rights are often not cleared for publication. Third, in many ways online courses involve privacy data, in bio-medics even patient-related data. These data cannot be opened to the general public. Fourth, teaching is a dynamic thing: on the e-learning environment: one will find a lot of drafts, unfinished materials, debates, that are not meant to be published. We all know that there is also a fifth reason imaginable why people are reluctant to publish their e-learning materials in an

open context: the quality might be not good enough. In his sense, promoting university teachers to work towards open publishable materials is a good instrument for quality control.

Impact

The UOC is a member of the Open CourseWare Consortium (OCWC) and is member of the Universia OCW project too, a consortium of Spanish speaking universities. OCW is managed by the learning resources management department, directly under the Vice-Director of Academic Planning, but the responsible for the OCW is reporting to the Vice-Director of Technology. UOC has high hopes from a new policy about OER which promotes a use of modular, reusable OER. They anticipate that this policy will promote the use of open licenses for a great part of our learning resources.

The impact of the university on the society can be greatly increased thanks to the OCW project. The authors can share the learning resources using the OCW site and open licenses, and then use them in other educational institutions for teaching purposes.

B. The "course" concept

An interesting discussion took place at the OER-HE stakeholders workshop in Leuven in March 2011 (<http://www2.arts.kuleuven.be/oerhe>), where the question emerged what is in fact to be included in the Open Educational resources. What follows has been published in our Edulearn 2011 article (see bibliography and annexes). First of all, we should focus the discussion on Open Courses rather than Open course materials, which of course can be of many different types. For the course, we could identify: a summary of the field, structure and outline, references and links, teaching and learning activities, formative and summative tests. The very difference between a course and a handbook is exactly in the learning path that is included. Ideally, a course contains a view on section learning duration, exercises to be made, selected literature to be reviewed. More and more, since reliable content can be gathered from the web, courses will point to existing materials rather than rephrasing or citing them.

This means the element of guidance and selection is quite important. OER conceived as Open Courses should then take into account these expectations and offer not only course content, but elaborate ways to guide the student through these materials. Of course, this touches upon the business model of both traditional universities and Open and Distance Learning Universities. When you put course content online for free – in the hope others do the same and there is a win-win situation – the business effort can go to the student support offered.

So, for a sustainable business model for Open Universities OER should be clearly defined as being the course *materials* involved, such as the course text and exercises and self-tests. Everything that goes beyond that and pertains to the pedagogical support quality, such as tutoring, and the whole summative testing should be kept apart from it. In this way interested students can be offered course or exam contracts, which fits the way Open Universities do their business. But this model also attracts traditional universities. In the case of this project, e.g., it emerges that also K.U.Leuven is considering offering students access to course support under a separate fee apart from the exam contract, for those students that do not take the regular course credit contract.

But this does not mean that an OER course concept, certainly not an intended collection of OER courses for a University, should be limited to the course text. Quite on the contrary. When one wants to reach the goals stated above, such as reaching out to stakeholders, fostering life-long learning, having regional impact etc., it becomes clear that OER can only function as part of a well thought-through network that embeds the course in the knowledge and human activity domain it pertains to.

A good OER course differs from a handbook in this sense that first off all, being a course, it structures the knowledge field, and initiates the student into it. This initiation is of course not only into the information involved, the content, but also to the human activities that give meaning to this content, and the network of people that give authority to this information so that it can become knowledge. An open course should be a gateway to a knowledge field, as is illustrated in the following diagram:

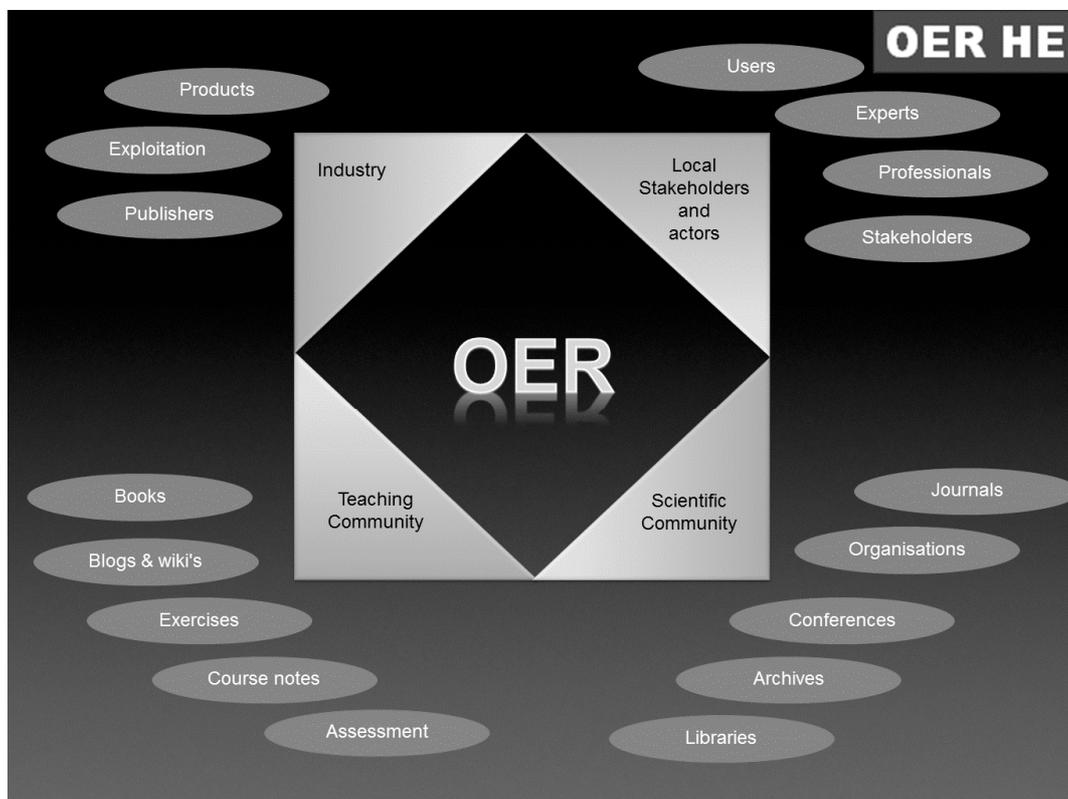


Figure 1, OER in context

The big strength of universities over other information providers is that it is strongly embedded in the research and industrial communities of the domain. This should transpire in the open courses that universities deliver to the public sphere. This is of particular importance since the industrial network in which the research is embedded can also disclose certain limitations to the knowledge claims involved. When you do research on nuclear power in close collaboration with the nuclear industry and your open course emanates from this, it is important that this is made clear to the reader, so that he can be the judge whether this implies possible bias.

Besides the network, it seems equally important, as it emerged from our workshop discussions, that the pedagogical model used by the university to bring knowledge about starting from the course should be made explicit.

“Open” should not only apply to the content, but also to the procedures, the knowledge transfer, the validation and accreditation. Only this way there can be genuinely transparent knowledge.

C. Licensing models

The literature on business models and open educational resources is growing; See amongst others: Downes (2006), Dhokalia, King & Baraniuk (2006), Koohang & Harman, (2006); Hylen/OECD (2007), Guthrie, Griffiths & Maron (2008) Lane, (2008), Helsdingen, Janssen & Schuwer (201) and Langen

(2011). Many of these authors tend to concentrate on the question of how revenues of OER-projects are generated. And by doing so, other relevant aspects of the business model ranging from inputs and activities to customers are not taken into consideration or even ignored. A sustainable business model should take into account the internal organizational aspects of production and use of open educational resources, the technology involved, the distribution and market channels needed, the financial flows, all in relation to the needs and want of the users. A business model represents an organization, its processes and activities and how this organization creates, delivers and captures value.

From such a holistic perspective, Helsdingen, Janssen & Schuwer (2010) have looked at current OER initiatives and have analyzed them according to the business model framework of Osterwalder & Pigneur (2010). Central in their approach are the needs and wants of users or customers. Without this category, there can be no valid business model analysis of Open Educational Resources. Osterwalder & Pigneur have identified nine critical aspects of any business model, called building blocks:

- Customer segments: group(s) of customers with common needs, common behaviors, or other attributes.
- Value proposition: The value proposition encompasses the set of products or services that create value for a specific customer segment.
- Channels: the channels represent the methods by which the customer is reached for sales, communication or distribution.
- Customer relationships: the customer relationship describes the types of relationships a company establishes with specific customer segments.
- Revenue streams represent the cash a company generates from each customer segment, either one-time customer payments or recurring revenues from ongoing payments. There are several ways to generate revenue streams: asset sales, usage fees, subscription fees, lending/renting/leasing, licensing, brokerage and advertising.
- Key resources: The key resources are the most important assets required to make a business model work. For some organizations, the key resources are the human resources, for other organizations it may be the production facility, or the distribution channel.
- Key activities are the most important things a company must do to make its business model work.
- Key partnerships describe the network of suppliers and partners to optimize business, reduce risk, and acquire particular resources and activities.
- Cost structure encompasses all costs incurred to operate the organization.

Using this canvas model Helsdingen, Janssen & Schuwer (2010) have been able to identify distinguish two different groups of OER initiatives. The first group focuses mainly on publishing OER content on their websites as a service for students, self-learners and educational professionals. These organizations do not have OER at the core of their business plan, but rather offer OER as an addition to their regular businesses. They are mainly involved in repurposing their own educational materials and making them suitable for self-study and open access publication. Their focus is on enhancing their reputation and offer support to students and researchers. Because they have little interaction with their users and only few of these type of organizations offer social software tools, they do not seem to be interested to use the community for establishing collaborative learning environments, or for reviewing /revising published learning materials.

In their aim to share knowledge and enhance the quality of learning, they may not be as successful as they hope to be. First of all, they do not seem to adapt their proposition to specific customers. Many

of the OER courses are adaptations from fee-based courses, thus giving the impression that the special needs of self-learners, or disadvantaged groups, have not been considered in the development of the OER. Maybe this is because they lack knowledge: Apart from some rough demographical data, many are not collecting details on the learning needs of their customers. Secondly, many of the OER are content oriented, instead of organized to create meaningful learning experiences for the learner. Thirdly, the open learning environment that these organizations have created provide little or no feedback to learners, other than worked out examples that they can use to verify their own solutions. With respect to their ambition to share knowledge, the lack of interaction with their customers in the creation and adaptation of OER suggest that these institutions are not so much sharing but rather giving away.

Revenues generated by these organizations usually are government or foundation funding and transfer to fee-based programs, although not many seem to actively promote this transfer. They usually offer the OER in a dedicated, separate website, and they do not have smart teasers or interactive webtools integrated in their OER presentation to seduce users to look at fee-based programs.

The second group of OER initiatives are organizations that are dedicated to creating and servicing a large community of contributors and users of OER. Their business models are built around OER. These organizations' primary activity is to realize a web-environment and active community in which developing, sharing, adapting and finding OER is facilitated and encouraged. Their goals seem to be to share knowledge and to enhance the quality of learning materials. However, they often lack a vast knowledge base, do not employ course developers, teachers or researchers, and thus are dependent on the contributions of independent individuals. The materials offered are very diverse: They range from complete language courses to small learning objects such as pictures. They usually do not have an official peer-review procedure although some form of quality control may emerge from the virtual community using and adapting materials. The organizations are actively seeking input from their visitors, offer tools for OER development, facilitate search for OER is facilitated and re-use of materials is encouraged. Even training programs and workshops are organized to teach users how to create OER. However, support in the didactical aspects of the OER is somewhat lacking: The OER are often content-oriented, and only sporadically materials are found that present meaningful activities to learners. In the latter case, feedback is usually provided by peers. Thus, although sharing and interaction may result in large amounts of materials offered, frequent revisions and reviews, the quality of materials and learning experiences cannot always be guaranteed.

6. Conclusion

By looking into OER from the perspective of three quite distinct institutions: the K.U.Leuven, a traditional university with a large regional footprint, the OUNL, which engages in a Network Open Polytechnics and the UOC, which radically chooses for a virtual campus concept, we found out that the need to serve multiple campuses, whether they are real or virtual, brings very concrete and specific arguments for OER, that strengthen the case for widening participation, life-long learning, exposure and internationalization. We noted that besides regional impact, OER can help with mainstreaming, regional collaboration and interdisciplinary research.

The Open courses can be a common reference point around which people and activities organise themselves in a regional or interregional context, sharing the responsibility and workload for knowledge by reaching out to local stakeholder communities and thus fostering knowledge participation and growth.

The regional, recognisable embedding adds a trust relation to publicly available information on the anonymous internet. While it makes sense, from a business model point of view, to clearly differentiate between the strict course content and the learner support and accreditation services offered, one cannot limit an OER project to the sheer content. The structuring force of a course should not be underestimated, and besides the pedagogical support system (exercises, tutoring) that goes with it, its embedding in the actual network of the knowledge domain, with links to the industries that thrive on it is essential for OER to do what it does best: seeding knowledge so that it is used, re-used, re-combined, and leads to new knowledge in yet unforeseen domains.

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