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OEII - “Open Educational Innovation and Incubation"

Open Educational Innovation and Incubation

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1. Introduction and background

In face of enormous socio-economic and demographic challenges, Europe requires an advanced educational system which contributes to innovation, competitiveness and economic growth. The higher education sector should be a key part of this system, leading through demonstrating and delivering innovation. Many factors contribute to universities' successes and failures, including: course offering, pricing, openness, social and professional regional embedding, market conditions, access to finance, educational R&D, constellation of the local regulatory framework, entrepreneurial capabilities and culture, intermediaries, stakeholder cooperation, and knowledge transfer mechanisms.

Educational systems & associated business models must be increasingly agile to respond to, and survive within, an environment characterised by rapid and diverse changes. Universities must search to create added value and innovate (more) systematically. They must learn to reinvent, reinforce and restructure educational programmes with requirements of the innovation-driven economy in mind. They must do this by acknowledging the centricity of the lifelong learner. As the call for highly educated, employable and entrepreneurial students with more converging market skills is loud, curricula infusion with new elements must be a part of a systematic discussion between universities and external parties. It is high time that the acceleration processes to university entrepreneurship, university interfacing, and university-market receptiveness are identified and assessed. Universities must systematically explore how higher education can better connect with the labour market opportunities, and enact a dialogue between university management, public (policy) bodies, social partners, foundations, commercial & non-commercial partners, so as to increase the strength of the links between the education, training & retraining of individuals, academics and professionals and the needs of European society as a whole. The collection of practices of university-market interfacing must systematically contribute to this objective, and increase capacity building in favour of more rapid educational innovation and incubation.

This document provides the recommendations of the Open Educational Innovation & Incubation (OEII).

The first section summarises the objectives and methodology of the OEII project and the steps leading to the recommendations in this report. Next special attention is given on the importance of open and online education, the (business) drivers behind it and the lessons we can recommend. Other recommendations are clustered around open education (section 4), online education (section 5) and open innovation (section 6). All recommendations are indicated by

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2. Objectives, actions, methodology

2.1. Objectives of the OEII Project

The aim of Open Educational Innovation & Incubation (OEII) is to conceptualise the design of a sustainable organisational interfacing which supports improved university-market receptiveness and improves (internal) university incubation and open innovation.
The primary objective of OEII is to formulate recommendations on the organisation of a (more) transparently organised, and sustainable, university-market interface, which is receptive to inside and outside developments, and the valorisation of open educational innovation. The recommendations will include the following aspects:

(a) driving the employability-dialogue with external stakeholders on curriculum innovation & student skills and competences,
(b) enhancing educational attainment by establishing connective (post-academic) HE learning paths,
(c) acting as a provider towards more inclusion of the population, and
(d) improving the possibilities of social mobility for disadvantaged groups.

OEII systematically involves university management, change agents, internal & external stakeholders, multipliers and accelerators, to promote the knowledge exchange process between different parties. It seeks solutions to optimise the (open) educational innovation and incubation process, and identifies any organisational structures and opportunities that can be beneficial.

2.2. General methodology of the OEII-project

In order to keep coherency between the different WPs, this paragraph gives a brief introduction of the methodology applied by the project as a whole.

The primary objective of OEII is to formulate recommendations on the organisation of a (more) transparently organised, and sustainable, university-market interface, which is receptive to developments inside and outside educational institutions, and which encourage the valorisation of *open* educational innovation.

The overall approach can be divided into the following steps

1. Collecting general practices of different university interfacing activities. This will reflect the general interfacing activities aimed to determine the present situation at a university level and to determine the general success factors and challenges in that respect.
2. Define the opportunities of possible flexible interfacing cases on open educational innovation. These opportunities are sought together with external stakeholder in workshops, twinning sessions and webinars. In this activity we focus on the leading (front-end) practices at partners institutions in cooperation with accelerators and

multipliers. It will determine the cases to be assessed in the next step and gives already insight on successful open innovation on the basis of workshops and webinars.

3. Next, the selected advanced cases are assessed. The assessment includes common variables for research. These variables will come from success factors determined in the previous steps as well as related literature.
4. This is followed by an overall syntheses that will generate recommendations on sustainable interfaces for open educational innovation and will provide direct guidelines at a university level for different transitions to open educational innovation.
5. Finally the outcomes are translated into recommendations for policy makers.

Figure 1 describes the relations between these 5 steps and the different work packages.

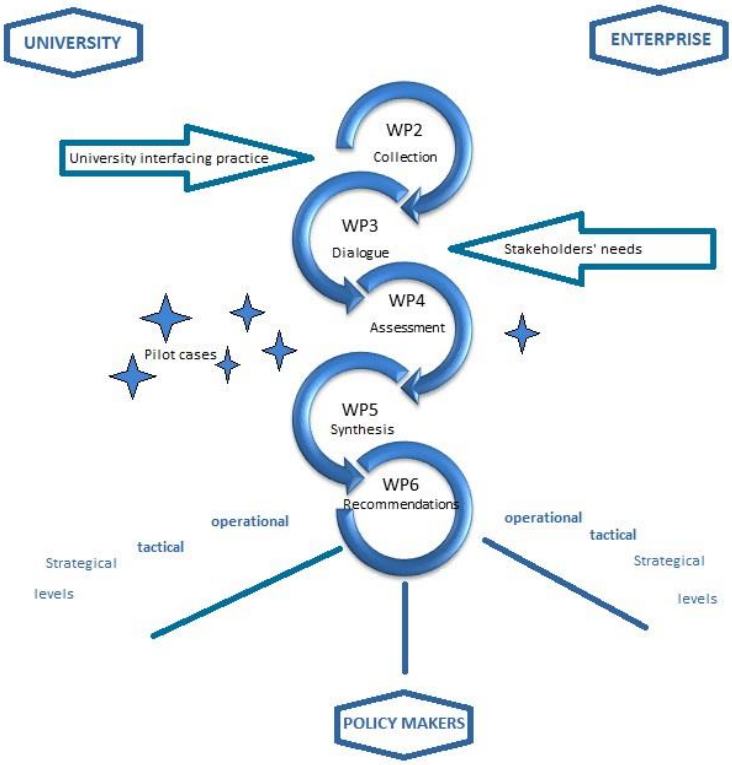


Fig 1. Work packages and methodology

2.3. Objectives and methodology of WP5 and WP6

Work package 5 (WP5) synthesises the outputs of WP2, WP3 and WP4. It will give lessons and recommendations on sustainable interfaces for open educational innovation. It will focus on recommendations at a university level . WP5 will not develop a golden standard but give guidelines for different transitions to open educational innovation.

Work package 6 (WP6) translates the outcomes into recommendations for policy makers on different levels. Difficulties which hinder successful innovation will be analysed and assessed in the framework of policy recommendations so as to identify where policy is lacking or

inadequate. Blank spots will be identified as to where new policy such as social, legal or funding policy would make a difference, e.g. to deliver a more benign environment for educational innovation. The objective is to create conditions benign to open educational innovation.

This document provides the recommendations of both WP5 and WP6 and is a public report.

3. Why open and online education? The drivers

Innovation is necessary to continuously adapt to ever changing circumstances. However, the educational system is generally the same for centuries. Did higher education not adapt to changing circumstances? We will not discuss these changes in detail and why the present HE-model is or is not functioning optimally both at system, country, institutional, classroom, etc. level. But is should be clear by now that Open Education and especially OER and MOOCs are seen by many as an indication that our higher educational system will change. Some of them say that they will be disruptive to HE.

Open education has become an emerging business for many institutions and countries. As such *open and online education* is seen as an innovation driver to improve education, and as a base for transformation of our (secondary and higher) educational system.

- To open something, it must first be closed. We can't open something that is open before.
- Opening up education implies that the educational system is closed somehow.
- One should define what element of HE we should open and why. This may differ between continents, countries and collaboration of institutions.
- The European HE system is said to be already open (reference). However, many aspects could be opened further:
    - free access (but bachelor-masters are not for free in many countries)
    - open accessibility / Openness to learners
    - open licensing (not a reality in many universities)
    - open didactics / pedagogics (still mostly class room models)
    - open credit transfer and virtual mobility schemes (element are there in Europe but we could improve significantly)
    - openness for employability reasons, open (knowledge and learning) networks

But why open and online education has become the main driver nowadays? To know more about this we should also look into the drivers for the present HE system and for new initiatives like studied in this project. "*When we use the MOOC the question of the 'reason' for education comes into focus*" (Cormier 2013).

Employability is a very important driver. EU states in Rethinking Education (reference – something from http://ec.europa.eu/education/news/rethinking_en.htm?) that the potential of European higher education institutions to fulfil their role in society and contribute to Europe's prosperity remains underexploited. The main argument used is that youth unemployment is now 23% across Europe and at the same time we have over 2 million unfilled job vacancies. The knowledge economy continues to increase demand for higher skills but more than 70 million Europeans have only low or no formal qualifications. By 2020, 20% more jobs will require higher level skills. It states that this highlights a serious weakness in our education and training systems. Efficient investment in education and training is fundamental to this. There is a strong need for flexible, innovative learning

approaches and delivery methods for improving the quality and relevance of higher education. It is essential that Member States create flexible options, such as high quality distance learning. Widening access and engagement through Open Education is a necessity. OER, MOOCs and Open Education in general are opening up new learning opportunities for millions of people and that is really the main point of it all (Creelman 2013).

This introduces *accessibility* as a driver. The main driver for open education on a national or global level was and still is access to higher education for all. Today there are 165 million people enrolled in tertiary education (reference). Projections suggest that the world's higher education system must accommodate additional 98 million more students by 2025 (reference). Sir John Daniel (former President of the Commonwealth of Learning) calculated that this would require more than four major campus universities for 30,000 students to open every week for the next 15 years n(reference). Furthermore, UNESCO estimates that more than 100 million children can't afford formal education [http://enikki.mitsubishi.or.jp/e/event/index6.html]. In western countries access to higher education seems abundant but it is not. For example the college tuition and fees in the US increased over 559% since 1985, making higher education unaffordable for an increasing number of people.

In this line of reasoning accessibility is related to the *costs* of higher education. Investments in online and open education, and in OER and MOOCs more specifically can reduce the costs of higher education. For example in the USA where the high cost of textbook has reduced citizens access to higher education, but recent efforts on open textbooks reduced those costs drastically (over 50%). Either the costs for students (even for free online availability with OER and MOOCS), the costs for HE-institutes in providing education and/or the costs of governments might change. It may even reduce the overall costs for HE in total while maintaining quality.

Open education is for one part seen as a free online availability, i.e. the OER and MOOCs offered are for free for the students. That means that someone has to pay the production and running costs.

- Typical funding models for Open Educational Resources and Innovation include the Endowment model, the membership Model, the Donations model, the Conversion model, the Contributor-Pay model, the Sponsorship model, the Institutional model, the Governmental model and the Partnerships and Exchanges model. (Downes, S. , 2006).

For example, currently HOU is using an institutional model, which is a variation on the sponsorship model. HOU as an institution assumes the responsibility itself for an OER initiative, which represents a part of the university's regular program, justified as constituting a part of HOU organizational mission.

Regarding *business models* at an institutional level, open education is (or was) mainly marketing driven, offering something for free to attract more students. (Early) examples of OER initiatives are based on a model as "Content for free, Teaching & Credentialing for a fee". MOOCs now offer courses for free but one has to pay for a credit to be recognised in a

accredited degree. Universities are increasingly looking to expand their online offerings and make more effective use of technologies. There is increasing demand from higher student numbers and greater diversity with a demand shift to development of skills and to find and use information effectively.

- Open education has become an emerging business for many institutions and countries.
- The benefits of openness may be accrued by educational insititutions, by the public(s) and state(s) they serve, and by third parties (commercial enterprises) or a combination of these.
- By now open education has become competition and demand driven. Elements for business models are low-cost HE, policy-driven implementation driven (changing business) and identity driven (openness).
- Given the proliferation of new competitors, there is a need for traditional institutions to tackle new competitive niches and business models.
- Open Education acts on a transnational and global level. It needs collaboration between governments, institutions and companies.

Cases of Uninettuno and KU Leuven (Manama) are examples of 'business models' in which companies are partner in funding (OEII D10, 2013).

So open and online innovation is needed to improve employability, accessibility, quality, costs and flexibility of HE.

4. Recommendations regarding open education

4.1. On OER and open courses in general

In the last decade, there have been major investments by many universities in publishing course materials online. Most of these materials are available for free and the number of these Open Educational Resources (OERs) available online continues to grow at an exponential rate. Starting with MIT in 2001, an increasing number of (often highly renowned) higher education institutions (HEIs) invested in OER. In 2006, a number of HEIs started to collaborate in the Open Courseware Consortium. This consortium has currently over 200 members, 64 in Europe. Spain alone has 40 members of the consortium. Many non-European countries promote OERs through an explicit national policy covering this area (e.g. Brazil, China, Indonesia, Japan, Korea, South Africa, Turkey, Vietnam). The USA had initiated a €2.0 billion project on OERs for community colleges. OERs mostly refer to online, freely available, educational resources.

One important characteristic of OER is its global scale. This means that people around the world can access the same materials as soon as they have an access point. The existence of open educational resources on the net poses strong challenges to higher education institutions since traditional cultures and practices within higher education as well as its legal frame enforce huge difficulties to the introduction of the openness culture that presupposes access, sharing, learning, interaction and innovation both within and across institutions of higher education as well as the outside world.

- In short, OER claims for new capacities and capabilities as it requires new ways of doing things that imposes changes in organization, legislation, evaluation and interaction between students, teachers and stakeholders outside higher education institutions. This means, OER demands from higher education institutions new ways of interfacing between humans, knowledge and technology to create new opportunities for knowledge flows and creation.

However, as universally recognised, education is a lot more than the provision of educational materials. Specifically, in online (and distance) education, the learning is a result of mediated online learning and teaching that are not constrained by time and/or distance. Online (and distance) teaching institutions provide their students not only with access to materials but also to a range of supportive services, both online and face-to-face. The ongoing evolution of technology also introduces opportunities of opening up education by providing a range of online support services. The latter are referred to as Open Education Services (OESs). While less developed than OERs, the discourse around OESs is becoming increasingly important to the future of the open education movement.

A more recent development, related to OERs and OESs, have been the emergence of Massive Open Online Courses (MOOCs). These have the potential to allow over 100,000 students concurrently to share a learning experience on the same course. MOOCs by

definition are offered free to students. MOOCs started in 2008 but they received considerable media coverage since the beginning of 2012. Renowned HEIs like Stanford, MIT, and Harvard are already offering MOOCs for free. Many renowned institutions are working with private start-up companies (e.g., Coursera) to develop and offer MOOCs. (Daniel, 2012: pp 3-4) However, it should be recognised that, as is the case with OERs, most investments in MOOCs have taken place outside Europe. Until September 2012, all MOOC initiatives came from outside Europe. The European answer to the exponential growth of MOOCs in the United States has been slow and fragmented, with only some HEIs in some countries announcing their own MOOCs.

- We recommend that European institutions should cooperate more intensively in open education.
- MOOCs, OER and OCW create opportunities to improve HE-system. Cooperation should include many actors involved in that playing field. Present case studies show little involvement of all actors.
- Create a Governmental group or lab that brings together rectors and directors, research centers, publishers, etc. from diverse HEI's to engage in conversations about potential new academic and financial models inspired by the potential of MOOCs that can help address: quality issues and criteria, attainment gaps, evaluation of initiatives, benefits for learners.
- Create an EU-level stakeholder forum or expert-group on open education, open access material and courses, to map the field and report to the EU with recommendations on evidence-based policy actions.
- Stimulate and promote the creation of consortia for OCW.
- Support initiatives for OER focusing on partnerships with a wide range of higher educational institutions.

The debate around how to best use OERs and OESs has become a hot topic in a number of international organisations (e.g. UNESCO) and in the political arena. For policy makers and international organisations, the main interest in OERs/OESs and in MOOCs arises from their perceived potential to improve access to higher education and lifelong learning by both improving the quality of education available (especially in developing countries) and also to provide higher education at a cost greatly below the cost of conventional higher education.

- The role of governments in the cases studied is very limited. Both institutions and governments should pro-actively work together. There common goal should be the focus for their cooperation (but perhaps is not only focused on access and costs).
- In the area of open education through MOOCs, OER and OCW, the possibility of new partnerships may emerge if there is a potentially massive audience available.

However, it needs to be recognised that, to date, most investment in OERs, OESs and MOOCs has taken place outside Europe.

- We recommend that it is of the critical importance of developing common MOOC models that reflect a learner-centred approach and develop a brand of MOOCs based

on European values like openness, equity, quality and diversity. They will also reflect the multicultural aspects of European society such as language and culture.

- Establish reward mechanisms and supportive measures for developing and sharing of OER experiences.

It is still early days and it is difficult to make solid predictions on the future of MOOCs. However, it is clear that MOOCs (and the more general OER/OES movement) is here to stay and it is incumbent on European HEIs to be involved in exploring and directing these new technologies.

4.2. Open Education and accessibility as a driver

Open education is said to give improvement by accessibility. As Creelman (2013) notes: Whatever you think of them ('MOOCs') they are opening up new learning opportunities for millions of people and that is really the main point of it all (Creelman 2013). As stated in section 3, open education and OER and MOOCs specifically are driven by given access of HE to millions. MOOCs provide them with a real lifeline to get above the poverty line.

MOOCs, OER and OCW have a clear social mission of making education accessible to a large public by means of free on-line courses and materials. Main goal is to democratize education. At the same time this kind of on-line education can be an important tool to connect and strengthen specific cultural or language communities. Organisors, providers of MOOCs, OER and OCW are convinced of its social and democratic importance.

But provide MOOCs really open access to all? Yes for most of the population. However, based on student population figures so far, most students already had access to higher education before. Many do already have a HE degree. Very few students (relatively) come from regions that have less access. Next, students need good internet connection, language skills (most MOOCs are in English), to understand global practices (hardly local cases…), etc. No doubt that online education by e.g. MOOCs increases accessibility to courses related to HE. But it is not open to all students by definition.
Moreover, MOOCs and most OER are non formal learning. I.e., for now they are situated outside the formal Higher education system. Students can obtain a badge or certificate of completion but rarely they are recognised as a formal credit in an accreditated curriculum. Hence, MOOCs provide only access to information and knowledge derived out of regular HE-system. However, this might change rapidly as already some efforts are undertaken to het formal recognition for MOOC and OCW.

- We should be very careful in stating that OER and MOOCs are opening access to HE.
- Special attention should be given to those potential student groups that really don't have yet access to HE for all kind of reasons. The design of the learning material and of the open courses should incorporate different student groups.

Moreover, some state that openness as with most MOOCs does not contribute to public case, that it is hard business and new western imperialism. Only the rich can provide free

OER and free courses (someone has to pay for it). Present MOOC providers only work with top universities, MOOCs is a business for getting the best students on campus HE (selection mechanism), to improve education for on campus provision and/or for selection of new talents by companies. Social responsibility and openness have become terms to sell business, to get money.

- We should be critical to what we mean by open accessibility and what goals we want to strive with that.
- These goals and practices on open access, social responsibility need to debated.

One could also state that MOOCs are a symptom of the failures in our higher educational system.

In March 2013 a special conference was organised by ICED and UNED in Madrid on social justice. In the debate at the end of the conference it was stated that *MOOCs are not a solution but a sympton of (failures in) educational system.* (Alan Tait). And that social justice should also focus on *inclusion and solidarity*. Next it was stated that *educational system partly broken with many push outs* (Card Titlestad, ICDE). Note that he uses push outs instead of drop outs. MOOCs and other online courses experience high number of drop outs, i.e. very few (3-10%) complete the course. Push outs are not only drop outs during the course but also those that do not have access to the course as stated before.

However, measuring drop-out rates, counting test scores, and adding up student satisfaction scores will not tell us whether a MOOC was successful. As MOOCs are positioned between informal and formal learning all different kind of motives of people enrolled are seen. Moreover, the actual outcome is expected to differ largely between participants and most likely will differ from the learning outcomes from the course design beforehand.

- We should measure the actual outcome of the (changing) intentions of the persons using OER, MOOCs and other forms of Open Education.
- The design of an open course should incorporate these changing intentions and allow multiple outcomes.
- Autonomy and diversity are important elements (see e.g. Downes , 2010)
- Whilst mechanisms to ensure quality are well established in formal education institutions, such mechanisms are not in place, certainly not in any formal sense, for MOOCs. We should incorporate experiences from informal and nonformal learning like with OCW, OER, learning networks. Examples are open badging or measuring the outcomes of communities and learning networks (Laat & Wenger, 2012) .

4.3. Importance of Digital openness

The last decade(s) the term open has in addition been associated with free online availability. However, open is more than free. In this context, "open" also refers to granting

of copyright permissions and beyond those offered by standard copyright law. Digital openness is a) free online availability AND b) open licencing.

Regarding the free online availability and open licencing we need to make a distinction between:

a) The software used, i.e. open source : a term introduced in 1998 that refers to the practice that gives free access to the source code of the software produced.
b) Scientific output i.e. open access : a label referring to free access to cultural and scientific/scholarly outputs, in particular making these available free of charge online, on the understanding that no changes can be made to them (something particularly important in the case of scientific publications and underlying material, open data).
c) Creative output i.e. open content: this is a collective name for creative work - for example texts, illustrations, audio, and video - which is published under a licence explicitly permitting the work to be copied and often also to be adapted and distributed (for example Wikipedia).
d) The learning materials i.e. Open Educational Resources / OER
e) Open Courses / MOOCS
f) And open online virtual facilities for tutoring, advice, meetings, communities, etc (i.e. Open Learning Services)

A central issue in digital openness is the licensing, standard copyright law being not adequate. Over the past years, Creative Commons has developed a system of open licenses which are fit to different circumstances and which are meanwhile commonly applied in the OER world. The most liberal (open) license is the so-called CC BY license. One often refers to the four R's, the rights to Reuse, Revise, Remix, and Redistribute content or courses.

1. Reuse - the right to reuse the content/courses in its unaltered / verbatim form (e.g., make a backup copy of the content/courses)
2. Revise - the right to adapt, adjust, modify, or alter the content/courses itself (e.g., translate the content into another language)
3. Remix - the right to combine the original or revised content/courses with other content / courses to create something new (e.g., incorporate the content into a mash up)
4. Redistribute - the right to share copies of the original content/courses, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

Open also means the ability to create, rip, mix and burn material freely, i.e. material to be accessed, reused, modified and shared by anyone. "Open licencing" is a continuous construct. Content/courses are less open to the extent that its license places restrictions (e.g., forbidding derivatives or prohibiting commercial use) or requirements (e.g., mandating that derivatives adopt a certain license or demanding attribution to the original author) on a

user's ability to engage in the 4R activities. Put simply, the fewer copyright restrictions are placed on the user of a piece of content, the more open the content is.

- In order to be really open the courses need to include open licenses.
- This is in line with the OER Paris Declaration of UNESCO encouraging the open licensing of educational materials produced with public funds.
    - Governments/competent authorities can create substantial benefits for their citizens by ensuring that educational materials developed with public funds be made available under open licenses (with any restrictions they deem necessary) in order to maximize the impact of the investment.
- Clarify copyrights and define licensing schemes for making OER available.

Remember that many MOOCs are massive but not always 'open'. Currently most MOOC offer are digitally open in the sense that they can be accessed by anyone anywhere (having an internet connection), and that they are free of charge. Quite often they are not openly licensed (see deliverable 10 en 11 of this OEII project).

Moreover, MOOCs and online courses are more than learning materials.

- These open courses should specify their (open) license policy regarding
    - the design of the course
      and it's
    - educational content
    - interaction p2p as part of learning community or even learning networks
    - feedback tutor (only partly nowadays in MOOCs) as part of the academic community
    - qualification and exams (only partly nowadays in MOOCs)

  As all these elements are 'open', it should be clear what others can re-use.

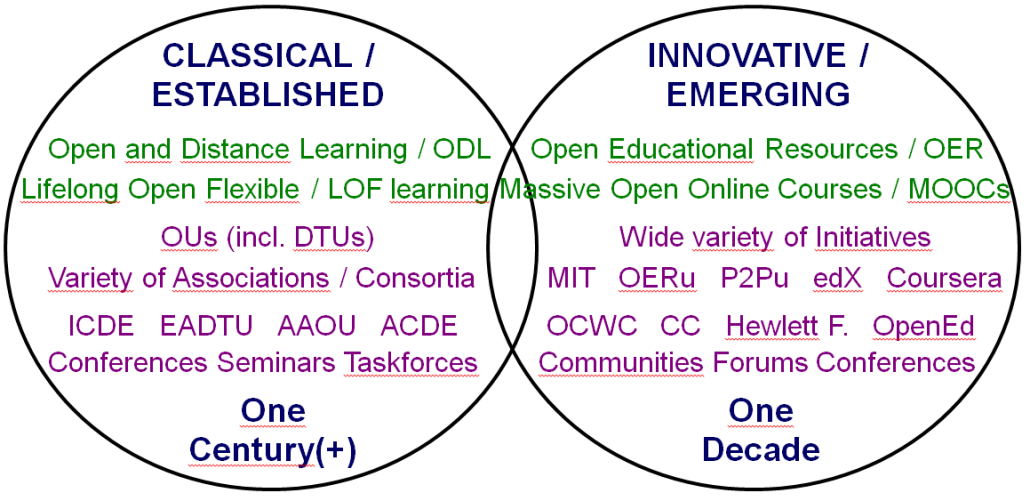
In general online education differs regarding the Openness to learners as well as in Openness about free online availability and their restrictive "open," permissions, or licensing in using their materials.

4.4. Openness to learners

Openness to learners is an essential element in opening up education and it encompasses the following six dimensions:

1. Open entry: anyone can basically participate regardless of prior education; strictly speaking, no diplomas are required for entry
2. Freedom of time: students can begin a course or programme at any point during the year and study at any time
3. Freedom of pace: a student can basically determine his/her own pace and schedule
4. Freedom of place: students can study using course books and with online learning resources and services; they can do so at home, at work (assuming permission has been granted), at a library, in a virtual classroom, on the train or on a plane, abroad, on a boat, in prison, etc
5. Open programming: the programmes involve certain freedoms as regards their content and order; a student can take and if necessary combine modules/courses as he/she wishes; there are partial programmes and complete open programmes
6. Open to people: the population is very varied, comprises all ages, and has a wide range of contexts, with the common feature being that the student is combining his/her (part-time) studies with work, domestic duties, or other activities: a wide variety of lifelong learners.

A 100% score on all six of these dimensions is very rare as demonstrated in the case studies of OEII.



- The present emerging open courses should incorporate the best of Open university and open learning perspectives of 'openness' with focus on: increasing access to higher education, reducing the rigidities in entry requirements, providing

opportunities to study subjects of choice to earn degree, learn anywhere with the use of appropriate technology, and study at one's own time and pace.

- The Open and distance teaching universities should embrace the innovative/emerging elements of open education (including elements of digital openness, free, online availability) and using their pedagogics to educate as many as possible.
- A joint effort must be made to reduce the push and drop outs by design of open courses beforehand such that the pedagogics and didactics becomes suitable for all students. Today, the focus is more on technology and less on innovations in open pedagogical thinking.
- Widening access and engagement through OpenEducation is a necessity.
- In open education we should also have an learner centered approach that supports independent learning.

Open education is an approach to education that seeks to remove all unnecessary barriers to learning, while aiming to provide students with a reasonable chance of success in an education and training system centred on their specific needs and located in multiple arenas of learning.

- Openness in education needs to embrace holistic approach covering all dimensions of openness and provide flexibility to the learners in both on-campus education and distance education system.
    - Digital Openness
    - Openness to learners
    - Open pedagogics-didactics with a learner centered approach that supports independent learning
    - Recognition options
    - Openness in the educational transactions, especially in the choice of courses, learning media and assessment

4.5. Quality and recognition options

Open Courses and MOOCS are more than OER as you can really follow a complete course at no costs. These open courses include services like interaction with the instructor(s) and other students. Course exits among other out of

- educational content
- interaction p2p (being part of learning community or learning networks)
- feedback tutor and being part of academic community
- qualification and exams

The quality of the open course should be measured by these dimensions. Moreover, lessons of open and distance teaching universities also stress the importance of high level interaction and short feedback loops in online environments.

- The quality of open courses and MOOCs are essentially more than the reputation of the institution and the learning material. Moreover, the quality is for large part also determined by the design of the course, the feedback mechanism and interaction possibilities.
- Whilst mechanisms to ensure quality are well established in formal education institutions, such mechanisms are not in place, certainly not in any formal sense, for MOOCs. We should incorporate experiences from informal and nonformal learning like with OCW, OER, learning networks. Examples are open badging or measuring the outcomes of communities and learning networks (Laat & Wenger, 2012) .

If you have completed the course, you often get a certificate or badge. Some courses only give a certificate of participation, others also mention the end result. Most certificates and badges are not (yet) recognized as part of formal education programs. OER and MOOCS are nowadays mostly positioned outside the formal HE-system. They educate people informal or non-formal without having the opportunity to get a formal certificate as part of an accredited curriculum.

- MOOCs, OER and OCW provide 'perfect' tools to redesign the way we may recognize informal and nonformal learning into formal educational programs.
- Assess whether MOOC courses are worthy of credit towards a degree or diploma.

Although the initial motivations for MOOCs were centered of building public relations and collecting massive data on online teaching, this situation is changing rapidly. For example, students can study online for free courses with "Ivy League" universities and pay for an exam (e.g. at a Pearson's test centre). In fact, only five MOOCs have been found credit worthy by the American Council on Education. And, even still, there is a lack of agreement as to whether to recognize this recommendation.

It has also been suggested that MOOCs will become the platform for attracting and (for some courses) teaching foreign students. It is still early days and it is difficult to make solid predictions on the future of MOOCs. However, it is clear that MOOCs (and the more general OER/OES movement) is here to stay and it is incumbent on European HEIs to be involved in exploring and directing these new technologies.

5. Recommendations regarding online education

5.1. Online education as a solution?

There is an increased interest in online education and major investments of many universities in publishing course materials online and for free. *Technology* plays a crucial role in this. The on-going evolution of technology also introduces emerging opportunities to opening up education by online support services. New technology enables the possibility to teach over 100.000 students at the same time in the same course (MOOC – for Massive Open Online Course). In the US, the 21% growth rate for online enrolments in higher education far exceeds the 2% overall growth (source: Babson Survey Research Group, 2011. Going the Distance: Online Education in the United States.). Students taking classes exclusively online will increase from 1.37 million in 2010 to 3.86 million in 2015. If this trend continues, "by 2018, there will be more full time online students than students that take all their classes in a physical classroom" (source: The US Market for Self-paced eLearning Products and Services: 2010-2015 Forecast and Analysis). Note that these figures are before the MOOCs where booming late 2011. MOOCs represent a sign of the times; they instantiate an example of how technologies can disrupt the status quo of education and are a forewarning of further changes to come.

In Europe, figures for online enrolments in higher education are not well known. Higher education in Europe does not reach enough people, especially of the age of 25 upwards. However, this group is crucial to broaden the qualified workforce in Europe and to keep the qualifications of postgraduate professionals updated. European HE strategies are focused on innovating the HE system with the ambitious goal of 15% participation in LLL and of reaching at least 40% of 30-34–year-olds completing third level education by the 2020 (Europe 2020 strategy).

The 2012 Joint Report of the Council and the Commission on the implementation of the ET 2020 goals the participation in LLL shows a slight downwards trend. The current level of 9.1 % (2010) is far below the ET 2020 benchmark of 15% to be reached by 2020 (ET 2020). Also, the report on the Modernisation of Higher education said that "in 2009 the European Union counted around 76 million adults who had not reached the level of upper secondary education" (European Commission 2011). Hence, the number of adults who have not reached higher education level is far higher. The risk that they will never acquire the necessary knowledge competences and skills is real.

Online education as integral part of national higher education systems is an important condition for closing the gap between the ET 2020 benchmarks and the current participation rates to higher education. The response of governments and institutions in Europe to opportunities of online education are however slow and fragmented.

5.2. Some recommendations on MOOCs specifically

Present MOOC providers are for now placed outside the (formal) university system. But university can lead the change on system level as well (and make for example connections between the non-formal learning in MOOC and the formal system). During the case studies of WP4 a diversity of recommendations, related to the development of MOOCs, have been formulated on the following topics.

Related to policy and collaboration

- Develop a supportive educational policy framework for MOOCs (financing, management and legislation).
- Collaborate with HEIs for joint MOOCs development and to negotiate about MOOCs offerings that respond to your requirements.
- Experiment with massive and open offerings to establish new relationships.
- Collaborate with content providers/teachers from other universities.
- Collaborate with relevant business partners like test and exam centres, publishers, platform providers.
- Encourage early discussions with potential stakeholders e.g. companies.

Related to exchange of experience

- More students in MOOCs gives more inspiration, different perspectives, more diversity (culture, religion, lifestyles, …) I.e. institutes must adopt teaching methods, get better feedback, can experiment, for more needs… and decide if they can learn (not-)to-satisfy all. It creates a creative meltdown, more talents to hount, more better students.
- The use of MOOCs in HE enables to broaden the participants volume, to offer in a planned and systematic manner quality teaching and learning materials and to facilitate the design of effective assessment tools diverse environments as well as links with the local enterprises.
- Exploit data from MOOCs run by external providers as a means of judging if and when to develop new courses and degree programmes.
- Initial population of students on MOOC courses provides an indication of the popularity of the course. Furthermore, retention and dropout rates may also give an indication of the level of and nature of teaching support that may be required for that topic.

Related to MOOCs and international outreach

- Support students to participate in international MOOCs that may be a virtual alternative to e.g. Erasmus Programs.
- Treat and support MOOCs as international reach initiatives bringing the best students from abroad to your country.

- By creating a MOOC, the university will gain the ability to share knowledge from its academic fields of specialization on an international scale.
- Promote the advantages of MOOCs, and of Open Education in general.
- We recommend that it is of critical importance of developing common MOOC models that reflect a learner-centered approach and develop a brand of MOOCs based on European values like openness, equity, quality and diversity. They will also reflect the multicultural aspects of European society such as language and culture.

Related to support within higher education institutions

- Develop a supportive educational policy framework for MOOCs within your HEI (on financing, management and legislation). Be aware that many institutional decision makers have yet to be convinced of the value of MOOCs (only convincing business models / drivers on global / national level).
- Develop a supportive infrastructure for MOOCs within your HEI (on a motivation system, financing via innovation funds, technical, instructional and library support services).
- Support the development of a supportive organizational culture for MOOCs within your HEI (leadership commitment, awareness raising services, facilitation of formal and informal knowledge sharing, encouragement of collaboration between talented instructors, technologists, and entrepreneurs at national and international level).

Related to finances and business model

- Develop a proper cost-effectiveness analysis to guide the decisions of educational policy makers and justify expenses on MOOCs.
- Provide in resources to enable MOOCs and to evaluate data generated.
- Funding must be available to enable MOOCs (courses are free available and someone has to pay)
- The relation between massive and business model is not proven yet. Is the goal of attracting more students an element in business model of institutions?
- Universities offering MOOCs may have a major financial incentive to limit academic credit only to registered —and not those following along free online.

Related to technical issues

- Run a MOOC on an existing open source platform or create your own platform if you have the resources.
- Share MOOCs with a technical platform to enable the collaboration between participating universities.

Related to the development of MOOCs and best practices

- For the further development of MOOCs, it is necessary to invest in the match between what MOOCs are offering and the needs of users and potential users, …

It is also necessary to be aware of strong and weak points of MOOCs, on what aspects need adjustment and amelioration, … For this aim, it would be valuable if the actual users of MOOCs would be willing to give their feedback on how and why they use MOOCs and whether MOOCs offer what users want or need to learn, to share their experiences with other users but also with teachers and providers. In addition, exchange of experiences between users/students could have a stimulating and multiplying effect on the use of online learning materials.

- The MOOC platform provides a way of testing content and pedagogy with a diverse student population.
- As MOOCs continue to expand internationally, universities must view it as an opportunity to improve the educational and pedagogical quality across disciplines ad scientific fields by use of MOOCs.
- Provide guidelines for developing MOOCs at institutional level. Develop blueprints for developing MOOCs at course level.
- Share best practices and suggestive regulatory frameworks to allow for the unbundling of course design.
- Share knowledge on best practices and lessons learned from MOOCs.
- Develop quality schemes, for open courses, by analyzing international projects and best practices.
- Establish quality criteria and quality assessment procedures for MOOCs.
- Support the creation of specialized directories linking to high-quality repositories, using commonly agreed standards for classification and sharing.
- Invest in localizing existing and well working contents.
- Check in your organization what content could be implemented in a MOOC.
- Before launching a new MOOC, realize a (pre-)test period, with a short number of learners, in order to identify and adjust weaknesses.

Related to pedagogics and didactics

- Invest in using the best in the worlds methods rather than content creation.
- Use a sound instructional approach suitable for online learning. Look at models of open and distance teaching universities or start to experiment with pedagogical methods that are already used in MOOCs. Make use of and stimulate the use of social and/or learning networks (e.g. for p2p feedback).
- Encourage learners to invest in informal communication in order to gain feedback that may improve the learning process.
- Stimulate students to share their experiences with the use of MOOCS with other students as well as with teachers and content providers. And assist them to provide constructive feedback about learning needs, towards MOOCs developers and teachers and tutors.
- Or for example create and develop in the form of MOOC competitions and contests that would allow the capture of talents.

- Make clear the added value of tuition provide by your MOOC in comparison with open and peer-support models.
- Clarify learning goals and expected outcomes of a MOOC, the profile of the expected learners community and the feasibility of the curriculum.
- Stay in touch with teachers and students during the course, to gather their feedback for future improvements.
- Integrate MOOCs as an additional educational resource in your university.

Related to teaching

- Involve passionate teachers in MOOCs, who will exploit all its features and benefits.
- Clarify the professional role, appropriate approaches and required skills of a teacher in a MOOC, e.g. as a producer and organizer of the materials.

5.3. Financing and legislation of online education

The response of governments and institutions in Europe to the opportunities offered by online education has been slow and fragmented. Despite considerable proof of both the quality and cost-effectiveness of online education compared to campus provision, the investments in Europe in this kind of education is falling behind compared to, for example, the USA and the BRIC countries. In Europe, the emerging possibilities of online education are only being embraced slowly.

Among the key reasons for the lack of provision of open and online learning are:

- governments finance HE-institutions in favour of traditional, on-campus, full-time education
- student loans and grants are also in favour of full-time students in the normal cohort of 18 to 24 years
- legislation and IP/copyright is insufficient (online users are 'discriminated') and fragmented (non-coherent)

- I.e. we need thorough analysis on the national level, focussing on issues such as the 1) financing of HE, 2) underpinning legislation and 3) accessibility of facilities of LLL/online education. A critical factor will be the extent to which open and online offerings are part of national accreditation systems.

5.4. Develop strategic leadership on open and online education

Another key reason for the lack of provision of open and online learning is that many higher education institutions are not fully equipped for the transition to online education.

- We recommend to develop strategic leadership in universities in linking online, open education and LLL to on-campus education. It must focus on (the role of) online

education for both of full-time students 18-25 years and online learning activities for people of the age of 25 and onward. I.e., to an integrated system-organisational approach.

- In addition, analysis are required at the institutional level focussed on:

  i) how they are financed for part-time/online education
  ii) institutional capacities to deliver open and online learning
  iii) how the online education is organised within the institutions

The purpose of such analysis should be to identify a set of key factors in the move to open and online education. Such an analysis must also determine the most crucial factors that are hindering and/or stimulating strategic leadership in online education. Examples of those factors are centered on

- online teaching and learning strategy (as integrated part of overall institutional strategy)
- organisational model (e.g., (programme) board, improvement groups, integrated or separate department, the existence of Open-/Online Educational department and/or national center, cooperation with other HE-institutions, external and (institutional-)stakeholders)
- the decision process at the university
- internal incentives and drivers (not only funding and business cases)
- quality assurance and improvement of online education (monitoring, student feedback, completion rates, staff-skills, reviews, etc.)
- sustainability and cost-effectiveness of online and DE compared to campus provision (business models)
- the role of openness, and OER
- new/different stakeholders in online education for both campus-students, online-students and LLL-ers. Competition and/or collaboration with these stakeholders.

5.5. Facilitate Universities

Universities must be facilitated in their transition for on-campus to online or blended approaches regarding curriculum and course development. This must focus on how universities can develop a curriculum suitable for online education with target groups both of full-time students and online learning activities of people of the age of 25 and onward. We should develop frameworks and training sessions in an open network based approach.

It must support and train traditional universities in setting up flexible and accessible education with pathways from informal to formal learning at all degree levels; that lowers barriers to participation but rigorously maintains output standards; will fit with the constraints and opportunities of employment and domestic life; responds to the ever-changing needs of employers and individuals for knowledge, skills and accreditation; that recognises and responds to individuality through personalisation; is cost-effective and scalable; and is innovative and responsive to change.

Examples of the most crucial factors that are hindering and/or stimulating development for online education at curriculum level are

- flexibility (in time and pace, place, modularity and credit transfer)
- pedagogical approach on curriculum level
- academic community development (e.g., p2p communities, learning communities and involvement academic staff),
- knowledge and skills and
- assessment procedures.

Note that flexibility probably means also a broader diversity in educational formats to meet the needs of students and companies (short programs, mobile learning, (virtual) seminars, etc.) as well as OER and training on demand.

On a course level examples of crucial factors are

- benchmarking
- educational strategy (e.g., blended learning models, roles of tutors and mentors in online education, use of OER and independent learning material),
- course design process (including relationship with curriculum, learning design, online tutoring)
- instructional design and course storyboarding (support and orientation materials, lectures, "finger exercises", homework, collaborative learning environments design)
- materials and production design
- assessment, pre-testing and evaluation (students' activities tracking, structured and semi-structured massive tests design, supervised peer-review systems, secure online exams experimentation).

Also the organisation model at both curriculum and course level must be analysed, including the procedures for continuous innovation of online teaching methods (pedagogical, didactical and technical).

5.6. Services and marketing

Supported open learning in universities requires specific strategies and scalable services, i.e. an institutional online education centre responsible for such tasks like marketing; the organization of tutoring, assessments, examinations; the organization of study centres; consultancy to students; the support of the design of learning material; being an interface with businesses, etc. Examples of those factors

a) technical infrastructure
b) role virtual learning environment and learning management systems
c) online tests and exams
d) monitoring and data mining systems (learning analytics) and
e) staff and student skill support

Regarding the later special attention must be given to how the academic and administrative expertise in the delivery of online education is built up over the years. We should focus less on (educational) content delivery but more on interaction, assessment and other (online) learning services (as the value of content is reduced significantly the last decade and as online content delivery is not the main asset anymore). Important aspects are online library, online student application and registration, learning communities, p2p communities, online assignments, study center, (inter)national collaboration, tutor and other academic staff communities, etc.

Open and online courses by themselves don't attract enough students. It is not enough to unlock intranet, powerpoint and making video of lectures available online. Marketing of online education needs a strong (image) branding related to an integrated institutional strategy. Moreover, the economics on open and online requires developing and delivering open products and services in partnership with others around the world. Investment in networked models (both regional and nationally and including companies) are needed to promote flexible and online education. In addition online marketing is strongly needed next to traditional marketing of online education.

6. Recommendations on open innovation

6.1. What is meant by open innovation?

Open innovation is so much more than MOOCs and OER. It also concerns how we innovate, and not only related to a formal environment, but other social and educational settings as well. Crowdsourcing environments have gained increasing importance, and as such have also been a target of OEII project.

From a few decades ago to now, the notion of innovation is coming away from models of industry productions, to be more related to the business of services, and the vision about what is innovation and how it occurs, is changing to a different model where innovation entails a more collective and shared process that requires multiple perspectives as well as an environment where innovation is more distributed (…..). Moreover, this new approach to innovation is more supportive of the developing business models and, more suitable to make them sustainable and profitable.

The term "open innovation" refers to this new innovative model paradigm and it was firstly promoted in the sixties by Henry Chesbrough. Thus, the "open innovation paradigm" comes forward as an answer to the growing sector of services business, and is sustained in four principles that are: "to think of business as a service"; "Innovators must co-create with customers"; "open innovation accelerates and deepnes service innovation"; to consider internal as well as external innovation initiatives generates service innovation (Chesbrough, Vanhaverbeke & West, 2006, p.4).

More formally, "open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, Vanhaverbeke & West, 2006, p. 1). This means that the open innovation paradigm takes into account as similarly important to innovation both the external and the internal knowledge. By doing so the knowledge landscape is strongly enriched and the possibilities for innovation improved due to new relationships that may be generated. Moreover, the process of "crowdsourcing" makes it possible that different institutions like universities, firms, associations, industries, commerce, etc, that own different traditions and perspectives in relation to the production and use of knowledge can collaborate with each other becoming a really integral part of innovation.

Other definitions of open innovation are

- *open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively* (Chesbrough, Vanhaverbeke & West, 2006)

- "*Opening up institutional ideas and knowledge assets to external parties for co-development, in order to generate innovation, new opportunities, harness new resources and reach new markets*." (JISC Business and Community Engagement)

As such MOOCs are mostly examples of traditional innovation instead of open innovation. And the lessons from MOOCs are typical for traditional universities. Universities are nowadays hardly the place for open innovation (but there are good examples). Although MOOCs started as a development inside universities, the main development is done outside. Innovation push with MOOCs is mainly business driven. We have found open innovation examples outside universities, which are based mainly on collaborative methodologies and horizontal management structures.

These open social innovation / crowdsourcing environments generate a space that facilitates new forms of relationship, participation and collective creation. They are a good example of how citizens can get together and create things collectively. The actors involved are different from those in higher education, although not exclusively so: academics, administrators and other higher education staff are also involved in these initiatives, directly as participants or indirectly, for instance through a research project.

In one of the cases analysed, the role of cultural mediators as dynamizers was crucial for the development of the different activities and projects. In the other one, this role is shared by most participants, shifting within the different activities. Self-management (i.e. in the form of *general assemblies*) and collective learning are key aspects of social open innovation.

6.2. Specific recommendations in relation to universities

During the case studies of WP4 a diversity of recommendations, related to open innovation, have been formulated on the following topics.

Related to networking and partnerships

- The world of open and online education does change the way we innovate our education system, our programmes and courses. Leveraging open as an economic driver involves developing and delivering open products and services in partnership with others around Europe (and the world).
- Analysis results proof that different kinds of networking and partnerships between different groups of stakeholders can be driving forces towards open education and open innovation. But often the collaborative activities have no policy support behind them, are based on more accidental projects of collaboration or concentration that develop 'bottom-up', opportunities are not enough explored, …
- The university must join an (elite) network of other universities to strengthen educational impact beyond its campus.

- Open education does change the relation universities holds with service providers (e.g., test and exam centers, publishers, providers platform), companies for training offers, investors (to open education), governments and foundations.
- Importance of research networks: universities involve their research networks more and more in discussions on educational topics, an evolution that can stimulate different kinds of educational innovation.

Related to the benefits of open innovation policies

- There are large sample studies that show that open innovation policies benefit higher education (Laursen, K. and Salter, A., 2006).
- Open innovation in combination with open education means:
    - For the university: to get more feedback on your educational offer, from a broader group than just students, also users on the job, what is an added value for the intrinsic quality assurance; more visibility (also international); a stronger position on the market (related to knowledge, financially, …); stronger connection with other HEIs. Benefit for universities in two directions: towards external world because own learning materials are online; for internal use because of use of materials from others.
    - For students and the labour market: higher accessibility of a more varied offer of learning materials from universities.
    - Open educational innovation stimulates the development of a broader learning context for students within a traditional (non-open) university.

Related to drivers and conditions for open innovation

- Often 'openness' is not the basis for the development of new ideas. New ideas find their ways because of individual interests and activities of academics but also because universities are confronted with new developments around them of which at a certain moment they absolutely need to be part of. Experimental developments related to open education gradually find their way through university on different levels, also on policy level. Individual teachers often still need to be convinced of the possibilities and benefits of working with online course material.
- Guarantee a clear and comprehensible communication on your complex higher education system towards external partners.
- Stimulate/ organise a higher involvement of alumni in the evaluation of new educational initiatives.
- Discuss the possibilities of financing of new educational programmes.
- Invest time and staff in the implementation and use of new educational methodologies.
- Provide adequate resources to HEIs at national level to ensure high quality education and research in the area of educational innovation.

- Develop a system of scholarship for a selected number of students for educational programmes with particular social relevance or with focus on sectors facing bottlenecks for employment.
- Stimulate the use of a competence based framework in the evaluation of educational programmes.

Related to development of collaboration with companies

- Many initiatives of collaboration between universities and companies start from universities. If companies themselves would be more active in the search for collaboration or concertation with HEI's …
- Stimulate academic staff to develop research projects jointly with the students, based on their work activity in the company.
- Produce a framework agreement that can be used to propose the cooperation between companies in need of training and the university.
- Collaborate with HEIs in order to stimulate and increase concertation on education and joint development of educational programs.
- Involve external actors (especially trade unions) in agreements between Universities and the Companies, on educational innovation.
- Involve external actors (like HE Ministry, Companies Associations) to facilitate the match-making between companies in demand of training and academic institutions.
- Stimulate industry to invest in education: financially, in terms of personal engagements, …
- Stimulate companies to advertise the results of the cooperation with HEIs, in order to valorise the whole activity and the workers' requalification.
- Involve external actors (Distance teaching university associations, HE Ministry) to promote the feasibility of agreements between companies and distance teaching institutions.
- Stimulate academic staff to develop close conversation with labour market on education
- Support good practices of collaboration with labour market and stimulate to broaden it to different disciplines.
- Evaluate the accessibility of the educational organisation for external teachers to avoid them hindering their teaching tasks.
- Recognise and stimulate the use of a common and generally accepted language in conversation with all partners on educational topics.

Related to didactics

- Diversify the typology of the didactic offer (single academic courses, degree programs, vocational courses) in order to fit the different students' needs in companies and to attract more students.

- Set up a proper model to constantly monitor the students' learning process in order to prevent drop-out.
- Organize the exams in the company facilities, in order to reduce the mobility of the workers of a company.
- Centralize the organization of exams to manage the logistic and didactic aspects.

Related to the role of social innovation /crowdsourcing environments

- Universities can learn from the way of operating in these environments: generating spaces that facilitate new forms of relationship, participation and collective creation.
- One of the aims of most higher education institutions is to stimulate critical thinking in their students, and raising awareness of social and environmental issues (beyond their subject studies). This can be promoted by engaging in, or supporting open social innovation, reflecting on reality and the need for collective action to achieve social justice goals.
- Universities should provide spaces to develop solidarity, mutual support, and a collective, non-competitive environment, both on-campus and outside it.
- Facilitate participative decision making: making sure bottom-up decisions which have been discussed with the participation of several actors at university have an effect on universiy policy or strategic decisions.
- Encourage academic staff to develop collaboration with open social initiatives, thus generating a space for mutual feed-back. The content of academic subjects as well as the methodology used can be enhanced by this collaboration.
- Furthermore, knowledge can be constructed collectively between the academics and the social initiatives, and shared with wide sectors of society through any of the open methodologies analysed. Quoting Chesbrough, Vanhaverbeke & West (2006) again, it is important to bear in mind that open innovation is "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively".
- Management of higher education institutions could adopt a more horizontal structure and become less hierarchical. Raising awareness among administrators, managers, and even academic staff of more open, participative, and horizontal forms of management (not easy in the complex structure of higher education institutions, but possible, at least to some extent). Good examples can be found in the management structures of open social innovation initiatives, including those with educational goals.

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Annex 1: Glossary

INNOVATION

- Innovation

  Innovation is the development of new values through solutions that meet new needs, inarticulate needs or old customer and market needs, adding value in a new way.

- Gradual versus abrupt innovation

  Gradual innovation refers to small, incremental changes that are made to activities in order to create more value with less waste. In contrast *radical innovation* (abrupt innovation or disruptive innovation) refers to high risk; high uncertainty projects which hold the potential to both influence the marketplace and bring high returns to firms. It is a kind of "promised land" of differentiation, growth and wealth for businesses and nations.

- Open innovation

  Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively. This assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.

- Social innovation

  Social innovations are social in both their ends and their means. Mostly social innovations is defines as new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. These innovations are not only good for society but also enhance society's capacity to act.

  The *process of social interactions* between individuals undertaken to reach certain outcomes is participative, involves a number of actors and stakeholders who have a vested interest in solving a social problem, and empowers the beneficiaries. It is in itself an outcome as it produces social capital.

OPEN EDUCATION

- Open Education

  Open Education is an approach to education that seeks to remove all unnecessary barriers to learning, while aiming to provide students with a reasonable chance of success in an education and training system centred on their specific needs and located in multiple areas of open learning.

- Open Learning

  UNSECO defines Open Learning as an organised educational activity, based on the use of

teaching materials, in which constraints on study are minimised in terms either of access, or of time and place, pace, method of study, or any combination of these. They define 'open and distance learning' as an umbrella term to cover educational approaches of this kind that reach teachers in their schools, provide learning resources for them, or enable them to qualify without attending college in person, or open up new opportunities for keeping up to date no matter where or when they want to study.

- Open University

  An open university is a university that is open to people without formal academic qualifications and where teaching is at a distance using specific didactics and media. Most open universities awards undergraduate and postgraduate degrees, as well as non-degree qualifications such as diplomas and certificates, or continuing education units. Initially they have been initiated by policymakers to make higher education accessible to all people. Hence, open universities are accessible for you, even when you might not have a certificate from secondary school. Moreover, the open universities have specific services for disabled persons and for people studying at a home/workplace at their own time and pace. Open universities developed a distinct policy around openness.
- MASSIVE OPEN ONLINE COURSE or MOOC

  A MOOC is a course or unit accessible, usually with no prerequisites, to anyone who wishes to enrol, usually for free, and with self-assessment or peer assessment along the way. It enables the possibility to teach over 100.000 students at the same time in the same course. Many are being offered by household name universities who may not give you credit towards a degree, but will often award certificates of participation, or even a grade. Most MOOCs are now delivered by acknowledged experts and outstanding teachers. They are very new, and no-one yet knows what they will mean or what role they will play.
- OPEN EDUCATIONAL RESOURCES or OER

  Open Educational Resources (OER) are educational materials with an open license, i.e. materials used to support education that may be freely accessed, reused, modified and shared by anyone. OER creators own the intellectual property and copyrights of the OER they create. However, they license the OER and make it freely available to others.
- OPEN COURSE WARE or OCW

  The term OCW is largely synonymous with the term OER. OCW refers to a specific, more structured subset of OER. An Open CourseWare is defined by the OCW Consortium as 'a free and open digital publication of high quality university-level educational materials. These materials are organized as courses, and often include course planning materials and evaluation tools as well as thematic 'content'.