The Why and How of Open Education

With lessons from the openSE and openED Projects

open educational framework for
computer science Software Engineering

Designing for participatory learning in
open educational environments

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Version 1.0

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NOTE I: This book includes parts of the following work in an original, amended, or modified form: Meiszner, Andreas (2010), "The Emergence of Free / Open Courses - Lessons from the Open Source Movement", submitted for the Degree of Doctor of Philosophy, Centre for Research in Education and Educational Technology, Institute of Educational Technology, The Open University, UK; available from: http://www.scribd.com/doc/33852509/The-Emergence-of-Free-Open-Courses-Lessons-from-the-Open-Source-Movement. To improve the convenience of reading, those original, amended, or modified parts have not always been quoted ("…") as such.

NOTE II: This book includes the following official project deliverables from the openSE & openED projects:

- 2.1 Requirement Specification Document of the organizational framework – Chapter Four of this work
- 9.1 Sustainability framework – Chapter Three of this work

To allow for a better understanding of the subject area of Open Education, the deliverables have been embedded within the narrative of this work.

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Foreword

This book is an introduction to Open Education (OE), giving practical guidance on the design and delivery of OE courses while wrestling with theoretical considerations of this new and emerging domain. Educators are the main targets, but it will also be relevant to policy makers, senior education managers and the learning industry as a whole.

The book draws from three sources: first from well-established online learning ecosystems, including Open Source Software communities; second from existing Open Courses in traditional formal education and related design models such as the Meta-design framework (Fischer, 2007); and third from EU funded research and pilot projects: FLOSSCom (2006-2008), openSE (2009-2011) and openED (2009-2012). This piloting work enabled a thorough analysis and modification of assumptions that emerged from sources one and two.

The first chapter provides a brief introduction to the OE field, addressing the question: 'Why Open Education?'. The second chapter presents cases from the openSE and openED projects on how OE might look in practice. Sustainability is as important for OE as for traditional formal education, so before joining any kind of OE venture it is important to have a clear understanding of how such a venture might be sustained, as discussed in chapter three. Theoretical considerations and practical guidance for the design and delivery of OE are presented in chapter four, ahead of concluding remarks and future prospects in the fifth and final chapter.

This 'Version 1.0' of the book is released together with the start of the openED course on 'Business and Management Competencies in a Web 2.0 world', whose second edition begins on 26 April 2011. It is also published in parallel with the re-launch of the openSE website, which is an OE framework for computer science software engineering.

A 'Version 2.0', with more in-depth findings from the openSE and openED projects and general improvements, is tentatively scheduled for summer 2012. Anyone interested in co-authoring this 'Version 2.0', be it with minor improvements or major extensions, are invited to read the editable version of this book at the following link and to correct minor mistakes 'on the fly': www.openEdWorld.net

1   An Introduction to Open Education

Terms such as 'Web 2.0' (O'Reilly, 2005), 'Open Educational Resources', 'the participatory web', 'prosumers', 'peer production', or 'social learning' are today often used when talking about new forms of learning and educational provision that have been enabled through information and communication technologies. And indeed it appears as if Web 2.0 tools and techniques have developed a dynamic of their own, creating many good examples of how to support individual and collective learning, provide learners with a richer learning experience, foster collaborative learning and knowledge production, or allow for the establishment of continuous and evolutionary growing educational communities (Bacon & Dillon, 2006; Schmidt, 2007; Schmidt & Surman, 2007; Staring, 2005). The Web 2.0 approach provides the potential of combining all kind of channels through which knowledge can be changed and shared, from pure text to interactive multimedia applications, allowing participants' to develop critical thinking and analytical skills on how to engage within those environments and how to take advantage of the web for their personal learning needs (Brown & Adler, 2008; Weller & Meiszner, 2008). This ever-growing ecosystem that the Web 2.0 provides potentially allows embarking towards new and innovative educational scenarios that are open, inclusive, collaborative, cultural rich and well aligned with modern pedagogies – in short, they provide the cornerstones to make Open Education possible.

1.1   Defining Open Education

Open Educational initiatives, such as MIT's OpenCourseWare, marked the start of the Open Educational Resource (OER) movement, a movement largely strategically driven by educational institutions. With this movement, good quality tools and educational materials were made freely available to educators and learners worldwide. During the past years, many institutions followed this move, indicating that there is a growing trend within traditional education to 'open up'. At current, the OER movement is tackling maybe one of the most crucial aspects for education: the free and open access to educational resources being released under a commons license and thus the possibility to re-use educational resources and to adapt them to personal needs (Schmidt & Surman, 2007).

Over the past years a main focus has been on this OER movement, with relatively little attention being paid to the higher-level field of Open Education. Open Education has a number of component parts, as will be detailed at chapter four, and OER is only one of such

component parts. Furthermore, and from the education production perspective, it appears that the OER movement still largely follows traditional educational paradigms, using for example experts' production and development models and inclining to consider the learner as a passive consumer. The traditional expert production model that still tends to come along with OER implies that content, learning activities, learning processes and the discourse thereof remain disconnected (Meiszner, Glott & Sowe, 2008b). In addition to this, and from the education delivery perspective, OER are often not embedded within an overall and sound educational concept. OER are released as resources and should be understood as such. Open as well as traditional education takes nevertheless more then just educational resources. The OER movement has opened the door to the next generation of Higher Educational provision. OER should, however, not be seen as an alternative to traditional education, but rather as an enabler to combine free / open learning with traditional educational forms and to provide new and innovative Open Education Services. Despite the vast potential that OER could provide for Open Education, and for the provision of new and innovative Open Education Services, it is a matter of fact that, so far, extant educational systems, and Higher Education in particular, have adopted relatively little of these new opportunities. Still, graduate education does often not employ "the power of new media in visionary or effective ways" (Derry, S. J., & Fischer, G. 2007) and is largely 'analogue', 'closed', 'tethered', 'isolated', 'generic' and 'made for consumption' (Wiley, 2006), though a vast and constant move towards online courses fosters a change from 'analogue' to 'digital' and from 'tethered' to 'mobile' (Wiley, 2006).

On the positive side it can be observed nonetheless that more recently a further type of openness has developed within the traditional Higher Education domain, where formally enrolled students engage as a part of their studies with peers from outside their own institutions, by using Web 2.0 and social media. This recent development appears to be a rather teacher-learner-driven approach, in contrast to the more institution-driven initial OER movement, and results in an ever-blurring border between the formal and the informal and takes further advantage of the opportunities the participatory Web 2.0 provides (Weller & Meiszner, 2008). This teacher-learner-driven approach can be perhaps best observed within the recent emergence of 'Open Courses', at which OER are combined with the other component parts of Open Education, and thus allowing for new and innovative forms of free / open learning (Meiszner 2010). Such Open Courses seem to experiment with a range of different educational approaches, tend to promote different levels of openness, incorporate different sets of free and open tools and learning resources, and – to a varying degree – mix the formal with the informal; bringing together the different stakeholders to be found on the

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web (Meiszner 2010). Altogether, the OER movement and the teacher-learner-driven push towards Open Education have created a new area that has the potential to emerge into such an 'Open Education domain'. This domain would allow for new forms of services that consist of, for instance, self-organised online learning courses, peer-to-peer and community based learning ecosystems, open production and innovation, open internships, or new institutional approaches towards Higher Educational learning.

1.1.1   A proposed Working Definition of 'Open Education'

Open Education – in the very basic form – might be defined as the free and open access to, the usage of and the right to modify and re-use digital open educational resources and digital educational tools, and the free and open access to the related virtual educational communities, in order to learn, teach, exchange or advance knowledge in a collaborative and interactive way. Open Education draws on community principles, collective intelligence, user dynamics, and on some type of continuity and growth. In Open Education, the roles of the different stakeholders are not fixed but can change depending on context, situation or scenario. Stakeholders of Open Education, and in comparison to traditional education, might include the following: own and fellow students and educators; free learners outside of formal education; practitioners and enterprises as producers, consumers or collaborators; or established virtual communities of practice. Open Education is seen to co-exist with traditional education provision and complement each other, whereas the Open Education part might be characterized by its overall free and open nature and the traditional education part might be characterized by its service nature available to learners; such as support, assessment, certification, or the access to any physical infrastructures; and with those services being either provided for fee or for free.

1.2   *Stakeholders in Open Education*

Open Education features an extended set of stakeholders than traditional education. This enhanced set of stakeholders is a fundamental difference to traditional formal education and provides advantages as well as it enhances complexity (Meiszner, 2010: 6, 9, 10). Stakeholders in Open Education, and depending on the Open Education scenario, might include educational institutions, educators, formally enrolled own and fellow students, 'free learners' outside of formal education, enterprises as producers, consumers or collaborators, or

established virtual communities of practice, such as Open Source Software communities or Wikipedia. If learning ecosystems are not limited to a closed institutional environment, then formally enrolled students would unavoidably get in contact with new stakeholders as a part of their studies. Within such open learning ecosystems, formally enrolled students might get in contact with other learners, that are perhaps enrolled at different institutions, or that might be free learners outside of any type of formal education, or with practitioners from virtual communities like for instance the Wikipedia one (Meiszner, 2010: 6.4, 6.5, 9.2, 9.3). The case of computer science education and Open Source Software communities (Meiszner, 2010: 6.5, 10.5) illustrates well how such different types of stakeholders can collaborate and interact at the web. Open Source Software projects appear to be a suitable space for students to engage at and to carry out some type of virtual internships that allows them to gain practical and real life experiences. The openSE project, for example, is exactly drawing on this apparent fit and aims to bring together, in a structured way, the formal education field of computer science with the practical learning opportunities provided within Open Source Software projects. Given the vast existence of communities of practice at the web, and beyond the Open Source Software domain, and given that internships as such are a well established concept in many parts of the globe, this virtual internship approach would in principle not be limited to the computer science case and could also be applied in other subject domains.

1.3   Why Open Education?

The potential benefits and gains, as well as the underlying motivations for engaging at Open Education, are manifold, and they might vary depending on the perspective or application scenario. Following, a brief overview of identified benefits, gains and motivations will be provided.

1.3.1   Overall Benefits of Open Education

The introduction of 'open' approaches to educational provision brings along a number of potential advantages. First of all, 'open' implies 'inclusive' and therefore free learners outside of formal education are provided with the opportunity to learn together with their formally enrolled counterparts; thus Open Education contributes to the goal of many societies to provide educational opportunities to all.

From a learner perspective, Open Education further enables all type of learners to get in contact and to collaborate with each other, but also to engage with professionals from communities of practice, such as Open Source Software projects in the computer science case or open enterprise networks for other education fields. This provides learners with real life learning opportunities, yet being embedded within a sound traditional formal educational context. Such practical and real life experiences also allow learners to gain soft skills, such as time and work management, communication styles, or negotiation and conflict management skills. Open Education further fosters the creation of open mindsets, since learners will engage with stakeholders from very different cultural backgrounds, as can be seen for example within the openED project. In addition to this, Open Education allows improving language and ICT skills, which are today recognized as being crucial. Ultimately, all of the foregoing also implies that Open Education enhances employment opportunities.

From an educational provider perspective, Open Education enables such educational providers to improve their educational offers, or to increase the value for money of their offers. This is to say that traditional formal education can benefit from the complementary Open Educational offers, for example through improved support available to students and provided by a larger then usual stakeholder group, a higher cultural diversity, the availability of a larger set of learning resources that is more frequently updated, and ultimately through opportunities for students to gain practical experiences that are directly relevant for their profession. Open Education is also a viable mean to connect educational providers with professionals and practitioners, thus allowing for double feedback loops and enabling educators to assure that their educational services match with market needs. Open Education also allows for cost-sharing and can lower the burden for the providers of education to support, mentor, tutor and guide learners, because these tasks can be shared between different actors, including the learners themselves. Open Education further allows for the provision of new services that could generate revenues, such as in-class lessons, private virtual support or marked assessment and accreditation/certification.

Open Education further benefits the stakeholder group consisting of communities of practice, practitioners, or open enterprise networks. This stakeholder group benefits through the artifacts and knowledge contributed by learners and the educational field at large and from which this stakeholder group can gain in their respective roles: as producers, consumers or collaborators.

1.3.2   Individual Gains & Motivations of participating in Open Education

Analogue to the benefits, the respective gains and motivations to engage at Open Education vary depending on the perspective or the application scenario. Motivations for learners to engage at Open Education might be of an extrinsic or intrinsic nature (Meiszner, 2010: 12.1.3). Extrinsic motivations, such as to obtain some type of formal recognition, are perhaps more inherent for formal education aspects; meanwhile intrinsic motivations, such as the interest in given subject, concern possibly more the Open Education side.

1.3.2.1   For formally enrolled Students and Free Learners outside of formal Education

Extrinsic motivations for formally enrolled students might relate to exams, assignments or evaluation, and constitute ex-ante a strong motivational factor to become active in, or to act as a co-designer of education (Meiszner, 2010: 6.5). Ex-post however, 'the learning experience and outcome', constitutes a further motivational factor why learners might decide to engage into open elements as a part of their formal education. The reason for this increase in intrinsic motivation is caused by the fact that students gradually realize the added value provided through such open elements, for example by having access to a large course population with whom to share and collaborate, or to have access to subject matter experts. This difference in 'ex-ante' and 'ex-post' motivational aspect suggests however that a right balance must be established between voluntary and mandatory participation – at least for formally enrolled students; as free learners cannot be ordered to perform any tasks. For formally enrolled students the active participation and co-design of the open elements might therefore be a part of their formal assessment. Elements of such active participation and co-design, that could be assessed, might include the submission of concrete outcomes, such as assignments and project reports, or the provision of peer-support, peer-assessment and peer-evaluation. For all of such elements it must be made clear however to students, from the beginning on, what would be expected from them, and they should be provided with clear outlines and defined dates on what to achieve and to 'deliver'. Such mandatory elements are not seen to negatively impact intrinsic motivations, nor is it believed that those mandatory elements alone would conflict with the desired situation of allowing students to tinker, experiment, find out and to commit mistakes (Meiszner, 2010: 6.2, 6.3, 6.4, 9.2, 9.3).

For the case of free learners, and the motivational aspects why they might decide to participate in Open Education, the main motivation, and a basic pre-condition, appears to be their 'personal interest in the subject area' (Meiszner, 2010: 9.2, 9.3). Though this seems to be

an obvious pre-condition for any type of educational undertaking, this might not always be the case for subjects to be taken in formal education, where a main motivation could equally be to just obtain the degree (Meiszner, 2010: 10.4). The opportunity to produce something, that participants see as their own work and can showcase to others, can also serve as a strong motivational factor, and thus learners should be provided with opportunities to actively shape their own learning space, so it would match their expectations and they see it as 'their' own product (Meiszner, 2010: 10.5.5). Further to such intrinsic motivations, extrinsic ones also drive free learners outside of formal education. Analogue to traditional formal education, participants in Open Education expect to be able 'to gain something', similar to the certification that students gain in formal education (Meiszner, 2010: 10.4). Certificates and degrees in the formal education case are typically accepted by the society as a mean to validate learning outcomes. This same acceptance and validation for informally acquired learning outcomes is seen to be equally desirable within an Open Educational setting; and traditional formal assessment and certification methods can certainly also be applied within Open Education. Other means of validating learning outcomes in Open Education might be however established, and they might be supported through virtual and mobile learner portfolios. Those learner portfolios could include for example information on learning processes and outcomes, as well as peer-assessment, peer-review or peer-evaluation information, so that others could objectively judge what has been learned and achieved. Individual performances and commitment, artifacts created, or the reviews of peers and crediting good contributions, are all possible elements of such a portfolio. Nonetheless, such means of validation and learning portfolios would need to be generally accepted so that they could compete with their formal educational counterparts. For example, participants of Open Source Software communities can show what they have done and achieved, and they are aware that the skills they learn have a positive value on the labour market and, that they are therefore able to compete with others that have a comparable formal degree (Glott et al., 2007).

1.3.2.2   For Educators & Practitioners

Open Education holds the potential to provide win-win solutions for both of the sides involved: educators as well as practitioners. For the case of Open Source Software and computer science education, for example, the students' work adds a value to the respective Open Source Software project, and it allows educators to impart their students key and soft

skills, and therefore constitutes a clear gain for both sides (Meiszner, 2010: 6.4, 10.5). Most of such gains can be directly derived from the benefits detailed at section 1.3.1. As for the benefits, also the individual gains overall tend to relate to one of the following three attributes: higher value for money, the option of cost-sharing, or new revenue opportunities through service provision.

1.4   Potential Socio-Economic Impact of Open Education

Open Education could allow for a higher level of digital inclusion and for the provision of new and innovative Open Education Services that potentially could have a high socio-economic impact in societies; and therefore could significantly affect economic growth and contribute to poverty alleviation. Many countries in the developed and in particular in the developing world would gain from improved access to Open Education offers, since this would allow them to localize those to truly fit their needs. Open Education further allows for the provision of services that meet actual local needs and that can be provided at local conditions. Open Education therefore could have a high impact even in the poorest and most remote areas, regions affected by the 'Digital Divide'.

1.4.1   Open Education in the Context of Developing Economies

In 2000, The International Bank for Reconstruction and Development & The World Bank (2000: 91) highlighted that developing countries stand for more than 80 percent of the world's population, but they account for just half of the worlds Higher Education students, and for an even smaller percentage of students with access to high-quality Higher Education. Since then, not much appeared to have changed. For instance, although the number of students enrolled in tertiary education in Sub-Saharan Africa is growing, this trend does not at all suffice to advance the educational structure of the population of these countries, so that they become able to compete with other world regions. This Sub-Saharan region, with approximately 740 million people, roughly 200 public universities, and an increasing number of private Higher Education institutions, still shows the lowest tertiary gross enrolment ratio in the world of about 5 percent (Materu 2007; Bloom, Canning and Chan 2005). Perhaps the most important reason for this problem is a lack of infrastructures and / or of means to use existing resources and infrastructures efficiently, due to technological, economic or social constraints in developing countries; as well as failed international donor intervention and a shift in funding

priorities from tertiary to secondary education (Bloom, Canning, and Chan 2005). As could be seen from projects like the EU-funded FLOSSInclude project[1] or the German funded ict@innovation programme[2], key problem areas and areas of blocked potential for capacity building are often beyond the infrastructure level of access to electricity, computers and connectivity. Such other areas are overwhelmingly of a socio-economic rather than technical nature. Informing people, especially in rural areas, about available resources, opportunities and alternatives to suboptimal solutions they might be used to (like using illegal copies of software for education and business) is a big challenge in developing countries. Providing people with access to alternatives, and opportunities to learn how to use them effectively, is even harder. In this regard, Open Education could allow for global and fair, adaptive and sustainable collaboration; notably in between developed and developing countries, to achieve fundamental progress for both. Knowledge can be effectively generated through the transfer from the more experienced to the less experienced; the lack of infrastructure, or the lack of its effective use, creates nevertheless often a vicious circle that must be broken: "Knowledge begets knowledge. Fruitful scientific inquiry is often aided by having a suitable intellectual culture. And a critical mass of scholars and teachers is often required before Higher Education can thrive" (The International Bank for Reconstruction and Development & The World Bank, 2000: 94). To break this vicious circle requires a concerted effort between developing and developed countries and substantial and wide-ranging improvements rather than patchy and incremental steps (The International Bank for Reconstruction and Development & The World Bank, 2000: 91, 94). Open Education can tackle these challenges and allows establishing a systematic knowledge transfer and exchange, a two-way learning cycle, between developed and developing countries. Open Education Services, for example, provide a powerful means to overcome infrastructural weaknesses of and obstacles towards Higher Education in developing countries, because Open Education is not necessarily bound or limited to the physical presence of teachers and learners at the same location, or to fixed teacher and learner roles. Open Education is, in principle, independent of platforms and not limited to a single education provider, it is highly adaptive to specific needs, and can thus be tailored to the needs of developing countries. This allows for Open Education services to be cost-effective and provided by local agents, and therefore to be economical viable and affordable. Services around Open Educational offers could be of a manifold nature, including traditional in-class

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[1] Website: www.flossinclude.org

[2] Website: http://www.ict-innovation.fossfa.net/

support, or individual tutoring, that can be provided on a local base, and thus would be a powerful mean to provide access to high quality education.

1.4.2   Experiences from the openED Project: Open Education and Open Education Services in Developing Economies

openED is a pilot course on "Business and Management Competencies in a Web 2.0 world". The course is facilitated by educators and globally available as a FREE/OPEN online course. The first course round provided some evidence for the potential that Open Education and Open Education Services withhold for developed and developing economies. The course is delivered in English and consists of 10 modules, allowing participants to choose the individual modules that they like to take. Each of the modules includes some guidance and online facilitation, in form of weekly chats and support through discussion boards. The course has been running for the first time from November 2010 to February 2011 and attracted 283 registered participants. As Table 1-1 and Figure 1-1 show, the majority of course registrations has been from developing countries, in particular from Africa. The course has been promoted globally through the United Nations University network, as well as locally within Europe through the networks of the openED partners from Greece, Portugal, Switzerland and the UK.

openED Pilot Course Registrations - Round 1	
Total Registrations	283
Registrations from Developing Countries	185
Registrations from Africa	170
Registrations from Tanzania	71

Table 1-1 openED Pilot Course Registrations – Round 1; source: openED project, 2011
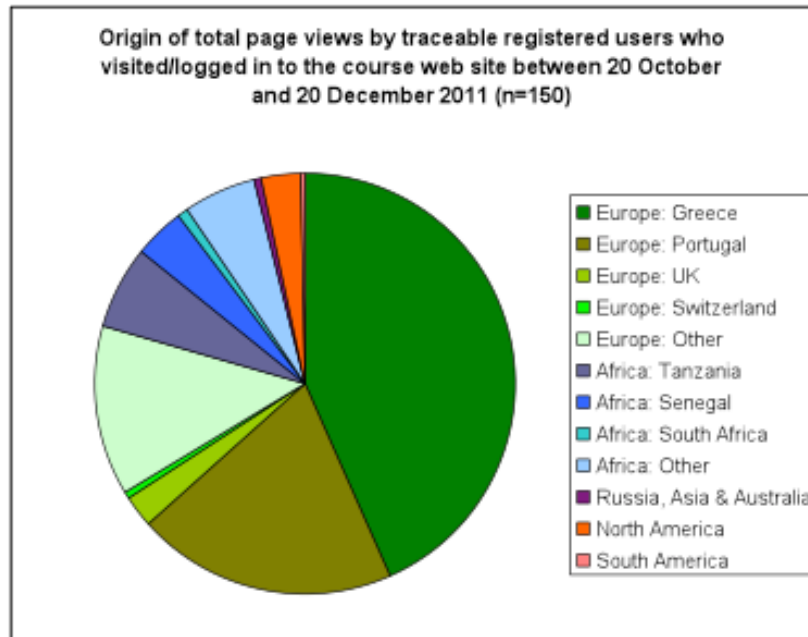
Figure 1-1 openED Pilot Course Visits of Registered Participants – Round 1; source: openED project, 2011

Given that the course has been promoted perhaps strongest in Europe, and equally promoted on a global base, the larger 'number of registrations' from developing countries cannot be explained with a higher effort of marketing activities within such countries, notably from Africa. Stakeholder consultation with educators from Africa suggested that the high percentage of 'registrations' or 'visits' from some of the African countries corresponds well with a high local interest in such countries in the access to good educational opportunities.

openEd 2.0 Pilot Course Statistics by Continent; source: openEd 2.0 project, 2011							
October 1, 2010 - November 15, 2010				November 16, 2010 - February 15, 2011			
Continent	Visits	Pages/ Visit	Avg, Time on Site	Continent	Visits	Pages/ Visit	Avg, Time on Site
Europe	946	8,91	0:09:40	Europe	1712	13,05	00:12:06
Africa	687	4,37	0:08:24	Africa	200	6,79	00:11:34
Americas	165	2,95	0:03:02	Americas	123	2,11	00:02:13
Asia	57	3,09	0:05:05	Asia	101	1,70	00:01:48
Oceania	14	5,50	0:09:07	Oceania	15	1,80	00:03:53

Table 1-2 openED Pilot Course Visits by Continent – Round 1; source: openED project, 2011

As Table 1-2 shows, the high 'number of registrations' from Africa as shown at Figure 1-1, is also reflected at the initial high 'number of visits' from Africa. The statistics for Europe include also the 'number of visits', 'pages per visit' and 'average time on site' from the team of the openED course itself, and are therefore not totally comparable against those from other continents. But what can be seen from Table 1-2, like also from the subsequent Tables 1-3

and 1-4, is that the 'number of visits' from Africa have been relatively high during the 4 weeks prior to the course start and during the initial 2 weeks of the course, but then for the remaining time of the course duration the 'number of visits' decreased considerably.

openEd 2.0 Pilot Course Statistics by Sub-Continent; source: openEd 2.0 project, 2011							
October 1, 2010 - November 15, 2010				November 16, 2010 - February 15, 2011			
Sub Continent Region	Visits	Pages/ Visit	Avg, Time on Site	Sub Continent Region	Visits	Pages/ Visit	Avg, Time on Site
Southern Europe	586	11,55	00:12:13	Southern Europe	1208	12,23	00:11:46
Eastern Africa	417	4,36	00:08:43	Northern Europe	273	14,73	00:12:36
Northern Europe	202	4,64	00:06:18	Western Europe	210	16,61	00:14:17
Western Europe	154	4,57	00:04:28	Eastern Africa	148	6,15	00:10:49
Western Africa	146	4,50	00:07:34	Northern America	111	2,21	00:02:24
Southern Africa	114	3,97	00:07:30	Southern Asia	47	1,47	00:01:05
South America	81	1,79	00:01:47	South-Eastern Asia	34	2,09	00:03:05
Northern America	73	4,34	00:04:29	Western Africa	25	11,36	00:15:20
Western Asia	19	3,89	00:04:42	Eastern Europe	21	2,90	00:02:11
Eastern Asia	16	2,19	00:03:20	Southern Africa	20	6,25	00:10:16
Southern Asia	13	2,31	00:04:26	Australia and New Zealand	14	1,86	00:04:10
Australia and New Zealand	12	6,25	00:10:38	Western Asia	12	1,50	00:01:33
Northern Africa	10	7,20	00:18:04	Caribbean	7	1,00	00:00:00
Central America	10	2,40	00:02:45	Eastern Asia	7	1,86	00:01:00
South-Eastern Asia	9	4,11	00:09:58	Northern Africa	5	4,40	00:16:36
Eastern Europe	4	4,25	00:05:15	South America	4	1,25	00:01:41
Melanesia	2	1,00	00:00:00	Middle Africa	2	8,00	00:20:10
Caribbean	1	1,00	00:00:00	Central America	1	3,00	00:00:39

Table 1-3 openED Pilot Course Visits by Sub-Continent – Round 1; source: openED project, 2011

Though the 'number of visits' from Africa overall decreased, the number of 'pages per visit' and 'average time on site' increased. For the case of North America, Asia and Oceania on the other hand the 'pages per visit' and 'average time on site' decreased overall over time. This indicates that African participants have continued to frequent the course website during the entire course period, and even spent an increased amount of time at it per visit. But in reality they have been relatively passive participants that rarely engaged in any of the subject matter discussions, or in the group activities, nor have they submitted any of the course assignments.

		October 1, 2010 - November 15, 2010			November 16, 2010 - February 15, 2011		
Nr	**Country/Territory**	**Visits**	**Pages/ Visit**	**Avg, Time on Site**	**Country/Territory**	**Visits**	**Pages/ Visit**	**Avg, Time on Site**

openEd 2.0 Pilot Course Statistics by Top 45 Countries; source: openEd 2.0 project, 2011

Nr	Country/Territory	Visits	Pages/Visit	Avg, Time on Site	Country/Territory	Visits	Pages/Visit	Avg, Time on Site
1	Greece	360	10,53	00:09:58	Greece	673	13,29	00:11:16
2	Tanzania	260	4,46	00:07:57	Portugal	480	11,51	00:12:50
3	United Kingdom	186	4,74	00:06:24	United Kingdom	251	15,59	00:13:30
4	Portugal	160	17,36	00:20:37	Germany	143	21,15	00:18:09
5	Senegal	120	4,40	00:06:36	United States	88	2,18	00:02:23
6	South Africa	101	3,92	00:07:16	Tanzania	64	4,47	00:04:00
7	Switzerland	93	2,34	00:03:05	Switzerland	43	8,28	00:06:32
8	Chile	59	1,53	00:01:04	India	39	1,54	00:01:09
9	United States	58	4,74	00:05:09	Kenya	32	4,28	00:15:27
10	Spain	54	3,28	00:04:00	Croatia	29	8,34	00:13:47
11	Uganda	51	4,90	00:09:45	Canada	23	2,30	00:02:27
12	Kenya	45	3,49	00:09:05	Zambia	21	16,33	00:31:16
13	Germany	36	11,72	00:09:43	South Africa	17	6,94	00:11:52
14	Rwanda	29	4,79	00:14:26	Austria	13	6,38	00:08:29
15	Côte d'Ivoire	16	6,31	00:16:12	Rwanda	11	6,18	00:08:25
16	Canada	15	2,80	00:01:56	Australia	11	2,00	00:05:17
17	Zambia	14	3,57	00:05:43	Italy	10	1,60	00:00:36
18	Namibia	12	4,42	00:09:07	Nigeria	10	7,40	00:21:17
19	Netherlands	12	2,17	00:02:09	Romania	10	2,70	00:01:08
20	Australia	11	6,73	00:11:36	Senegal	9	19,22	00:14:33
21	India	11	2,55	00:05:15	Philippines	9	1,11	00:00:02
22	Mozambique	11	2,45	00:02:56	Norway	9	1,67	00:00:48
23	United Arab Emirates	10	5,10	00:03:58	Uganda	8	7,63	00:12:19
24	Colombia	10	2,30	00:01:31	Singapore	7	1,00	00:00:00
25	Mexico	10	2,40	00:02:45	Poland	7	3,43	00:04:42
26	Sudan	9	7,33	00:18:51	Denmark	7	11,43	00:03:20
27	France	7	2,14	00:02:37	Netherlands	6	2,83	00:02:02
28	Israel	7	1,71	00:04:36	Ethiopia	6	1,17	00:00:00
29	Argentina	7	1,57	00:02:35	Trinidad and Tobago	6	1,00	00:00:00
30	Macau	6	3,00	00:06:27	Malaysia	6	1,00	00:00:00
31	Italy	5	3,00	00:11:53	Spain	6	5,67	00:06:45
32	Norway	5	2,60	00:00:12	Pakistan	5	1,00	00:00:00
33	Nigeria	5	1,60	00:07:35	Ghana	5	5,80	00:04:30
34	Sweden	5	5,60	00:12:34	United Arab Emirates	5	2,00	00:03:42
35	Myanmar [Burma]	4	7,75	00:17:58	Mauritius	4	1,25	00:00:00
36	Hong Kong	4	2,50	00:03:05	Sweden	4	2,75	00:03:45
37	Belgium	3	5,00	00:01:59	Myanmar [Burma]	4	8,25	00:16:06
38	Peru	3	6,33	00:15:57	Albania	4	1,00	00:00:00
39	Croatia	3	1,33	00:00:41	Serbia	4	2,50	00:08:02
40	Ethiopia	3	6,00	00:15:11	Indonesia	4	2,75	00:10:03
41	Ghana	3	6,00	00:05:02	New Zealand	3	1,33	00:00:05
42	Austria	3	2,67	00:00:48	Belgium	3	1,33	00:00:01
43	Ireland	3	1,67	00:01:56	Japan	3	1,67	00:00:45
44	Cambodia	3	1,00	00:00:00	Sudan	3	6,00	00:27:10
45	Malawi	3	6,00	00:28:55	Lebanon	3	1,33	00:00:00

Table 1-4 openED Pilot Course Visits by Country – Round 1; source: openED project, 2011

Analogue to Tables 1-2 and 1-3, also Table 1-4 shows that for most of the African countries the 'number of visits' decreased, meanwhile 'pages per visit' and 'average time on site' increased. Table 1-4 further shows a very high number in 'visits from Tanzania'. As can be seen at Table 1-1, out of the 170 course registrations, 71 had been from Tanzania. In

accordance to educators from Tanzania, Tanzanians are very interested in educational opportunities and have a strong culture of learning. This interest in educational opportunities did however not translate into active course participation of Tanzanians, as has been equally the case for all participants from Africa. It must be noted nonetheless that the course has seen a general high passive participation rate; and on a by-country level comparison one could equally find countries from the developed world that had comparable passive participation rates than the African cases. But none of the other countries featured as many registrations as has been the case for Tanzania, and almost all of those participants from Tanzania have been largely passive course followers. One of the reasons for such high drop-out, or passive participation rates, might be explained by a lack of skills required for participating at this type of online course; for example being skilled in using ICT or having sufficient self-study capabilities. Stakeholder consultations with educators from Africa suggest that for the African case indeed a lack of skills might have been one reason that prevents active participation at such Open Courses; and that learner from Africa perhaps would need some type of more close in-class support or tutoring. The same stakeholder consultations further pointed out that a lack of bandwidth and flat-rate availability might be an additional hurdle that limits the abilities for African participants to engage at online learning activities, and therefore a balance between online and offline activities should be achieved. Perhaps the lower 'number of visits' and increase in 'pages per visit' and 'average time on site' from African participants is therefore also resulting from such a lack of bandwidth and flat-rate availability; which overall might have been posing a too high burden to follow such an online course. For both, lack of skills and infrastructure limitations, Open Education Services, such as in-class support that is provided at a local level, might therefore be a suitable mean to overcome such problems. In such a case online participation might take place more targeted, like for example participating at selected online activities, meanwhile following the overall course locally in a traditional in-class setting. Furthermore, such locally provided Open Education Services can be offered at local rates and therefore should be affordable for participants from developing economies. The following two openEd pilot rounds, starting in April and October 2011, perhaps will provide some more evidence about such initial assumptions. Based upon the preliminary findings discussed at this section the openED course has taken however immediate actions and now provides an adapted infrastructure to facilitate the third-party provision of Open Education Services around the openED course.

1.5   Open Education: From 'Why' to 'How'

This first chapter has provided an introduction into the field of Open Education, including a working definition for Open Education. It also has been shown that Open Education consists of a number of component parts, including but not limited to Open Educational Resources / OER. Open Education further features a larger stakeholder group than traditional education; as will be further illustrated within the subsequent chapter two, and that those stakeholders might have different reasons to engage within Open Education. Socio-economic aspects of Open Education have also been introduced, in particular with regard to developing economies. Though Open Education might have a more significant socio-economic impact within developing economies, the economies in the developed world are seen to benefit equally from it. The following chapter will feature some cases that illustrate how Open Education could look like in practice, and some of such cases will also show how developed economies might benefit from Open Education, or how developed economies might benefit from developing economies.

2   Open Education Cases from the openSE & openED Projects

This chapter illustrates how Open Education might look like in practice. The following cases are grounded in the theoretical concepts of the openSE and openED projects and they draw on lessons learnt and recent developments within those projects. The openSE project is piloting ways of Open Education at a multi-course level and under involvement of Open Source Software communities, at which learners can engage at virtual mentored internships. The openED project is piloting ways of Open Education at a course level, with the course being provided to learners around the globe by a number of educational institutions. Overall, the cases provided within this chapter should be understood as fictive ones, and where this has not been the case all names have been changed. Chapter one has been introducing the type of stakeholders that can be found within Open Education, which were seen to be: Free learners outside of formal education, formally enrolled students and educators across institutions, or practitioners and communities of practice. For each of those four groups a number of cases will be presented within this chapter.

2.1   Free Learning Cases

2.1.1   Maya from Germany @openED: A Self-Print Certificate to show what she learnt

Maya is a 48-year-old account manager at a bank in Berlin. For a while she thought about enrolling into a training programme to better understand the complexity of contemporary enterprises. By times she feels that the way enterprises operate and function has changed quite a bit since she graduated, and that she should adapt her daily practices to such a changed situation. Instead of hitting the books again she is searching on the web for some training opportunities and stumbles across the openED Business and Management course. Besides being for free, what really calls her attention is the diversity of learners that signed up for the course. She quickly finds two other accountants from the US and Bahrain that also study the same course modules than she had enrolled at. During her study time at openED she not only manages to update her theoretical skills, but also to exchange experiences from across the globe. After having submitted all of her assignments she is printing out her 'Self-Print Certificate', which lists all of the modules she has taken and the assignments submitted by her. She is proud of what she has been taken out of the course and updates her profile within the internal HR system of the bank she is working for. A couple of days later the HR manager of the bank is contacting her to ask for a certificate that would confirm her updated skills. She

shows him the Self-Print Certificate and explains that all of the assignments and the related discussions with peers are openly available at the openED course page. The HR manager seems to be a bit confused about such type of online certificate and informs her that he will have a look at the openED course page. Some days later they are meeting at the corridor and the HR manager congratulates Maya for the good quality of the assignments that she has completed at the openED course. Following, he also asks if she could tell him more about the discussion that she had within the openED course with that account manager from Bahrain as the subjects that they have been discussing sound very interesting to him and of relevance for their bank too.

2.1.2   Landra from Portugal @openED: From Free Learning to Formal Learning

Landra is a 28-year-old housewife from Lisbon. Her sun just turned six years old and entered the primary school. Once her sun was born she had just finished her undergraduate studies. Since the salary of her husband was not sufficient to cover the current cost of their young family, she has been working part time at a boutique nearby during the past years. For the first time in six years she now again has some time at hand as the boy is out at school. She still has the desire to do more in her live and thus is searching the web for courses that she could take to update and refresh her skills. She finds the openED course and decides to enrol at the two first modules on "Tools for collaboration" and "Searching for information". She really enjoys the course flair, as well the subjects as the engagement with people from around the globe. Eventually she ends up taking all of the 10 modules of the course over the coming three month. She not only learns a lot at the openED course, but also realizes that she still has not reached her limits; and thus she decides to go back to university and to study for a full postgraduate degree. Fortunately, the new university has accepted to credit some of the modules that she has been taken at the openED course.

2.1.3   Eduardo from Mozambique @openED: Local In-Class Support and Certification in the UK

Eduardo is a 22-year-old technician by training and self-employed. He is maintaining technical equipments for domestic and international companies in the area of Maputo. Doing business with international companies is by time a bit difficult for him and he feels that it would be useful to learn more about Western business practices to better understand his

business partners. The openED course seems to be a pretty good fit for this, it's not only free but also provides some insights to Western practices – and on top of this it provides access to peers that come from those regions. Studying the course online is a big challenge to him, since bandwidth is limited and expensive. He sees at the course page that a local business school is offering In-class support to the course, including free Internet access before and after the classes. The prices for such In-class support are reasonable and thus he is signing up for such extra services. He decides to take all of the 10 course modules and through the combination of In-class support and online collaboration with course facilitators and peers he masters each of the course assignments. He is proud of what he has achieved himself, but would also like to get some formal recognition for this. The local business school informs him that he could either get a certification with them, or from a partnering business school in the UK. The certificate from the partnering business school in the UK is slightly more expensive, since the UK school would need to evaluate all of his assignments again. But he decides to pay this price, since he thinks that this is a unique chance to get a formal certificate from the UK – and something he could never have afforded without the openED course.

2.1.4   Laura from Spain @openSE: From Mentored Internship to Employment

Still being at high school, Laura has developed a passion for 'coding'. A year ago at the age of 18 Laura was helping to set up the new website of her school, and for this reason she was looking for tutorials on how to configure Joomla, which is a popular Open Source Software Content Management System (CMS). She found some tutorials but realized that she also would need to acquire some more basic programming skills, and this lead her to the openSE framework for computer science software engineering. openSE offered Laura free access to courses, tutorials, guides, and lots of reports from other learners that described how they have started, what would be important to consider and what are the pitfalls to be avoided. Moreover, openSE allows her to get in touch with those other learners and also with experienced practitioners from Open Source Software communities. After three or four month Laura has acquired a solid theoretical understanding on PHP and related topics; and she also has gotten pretty excited with all of the features and functions that Joomla provides. The next day at openSE she sees a vacancy from the Joomla project for some available Mentored Internships and immediately applies and gets accepted. The internship takes her three-month and upon completion she decides to continue and to join one of the Joomla development teams that works on templates for schools. Today Laura has graduated from high school and

makes some money as a self-employed web-designer for local schools. The earnings are reasonable and if all goes as planed then those earnings should be sufficient to finance her the Master in Open Source Software, for which she just had signed up.

2.1.5   Ioannis from Greece @openSE: Getting formal recognition for informally acquired skills

Ioannis is a software engineer by practice. He has 34 years and has been 'coding around' since the age of 22. Over the past years he did pretty good and could make a living with freelancing work. He feels however that it is time for him to look for regular employment in order to have a more stable and regular income. Most of the job offers unfortunately ask for some type of formal degree, and this is what he is lacking. He has been helping out at openSE over the past three years as a support provider for learner. For this reason he also knows about this one Master Course in Open Source Software from a Spanish university that is available through openSE. This Spanish university has an open entrance policy and upon contacting them Ioannis learns that the university takes into account his already informally acquired skills. To obtain this Master in Open Source Software he would need to pass some formal exams, as well as to study some courses for which he is still lacking skills. This sounds fair enough to Ioannis and thus he provides further information and evidence to the university on the skills that he already possesses. Both, his practical experiences as well as the support he provided at openSE are taken into account, and as it turns out he only would need to take some minor electives to then graduate and to obtain this Master degree. Twelve month later Ioannis is having a Master degree in his hands and he also has a new full time job as a system administrator for a local telecommunication company. Interesting though; his now company employed him based on his existing skills and in particular the commitment that he showed by pursuing a master and by helping out at openSE – but not because of the Master degree itself.

2.2   *Formally Enrolled Student Cases*

2.2.1   Anna from England @openED: Acquiring Soft-Skills & enhancing the Horizon

Anna is a 21-year-old undergraduate student from London and more interested in shopping around with friends then in studying. Anna comes from an upper class family and might be easiest described as superficial and spoiled. Her social contacts are not very different and the

evening news are the closest that she ever comes to poverty or the need to fight for daily things. As part of her business study she has to take a module on 'Project Management Skills' within the virtual openED course. This module on 'Project Management Skills' includes a group work activity to develop a project management plan. The teacher had made it mandatory that each of the students would form groups with other openED course participants that are located outside of the UK. As a result of this Anna is enrolling in a study group with Roger from Nigeria and James from Uganda. Roger runs a small consulting company and James works as a sales person for a local wholesale chain. Initially Anna is very dominant and insisting on developing the project management plan in accordance to the literature that is provided at the course. Roger and James however doubt the practical applicability of such a very theoretic plan. After some discussions have past a more collaborative dialogue emerges and Anna is also learning about the local situations Nigeria and Uganda and why such a project management plan might work out in the UK, but not under totally different conditions. By the end of this module on 'Project Management Skills' Anna has not only gained an extended set of subject matter skills, but she has also learnt quite a bit about different cultures and how to reflect on subjects from different perspectives.

2.2.2 Peter from Germany @openED: Improving language Skills on the Fly

Foreign languages have never been a strength of Peter and it hasn't been different with English. He usually feels unsecure and embarrassed about the mistakes he does and his grades mirror this lack of practice. But somehow this is different at the openED course. There are many participants that are also not perfect, but they try as good as they can to express themselves, and somehow this made Peter feeling more comfortable and thus he is also trying as good as he can. Over the weeks Peter realises that writing and chatting in English is getting something more and more natural, and one morning he wakes up and wonders if he was really dreaming in English the other night. He actually signed up for the openED course to learn something about business and management, but well, he doesn't mind of getting such skills on top. By the end of the openED course Peter's English skills improved quite a bit and he also got to learn about all of those business terms in English.

2.2.3   Shana from Tanzania @openED: From single Degree to double Degree

Shana is studying for a Degree in Business and Management at the university of Dar Es Salaam. One of the courses she has to take as a part of her studies is the openED course. She enjoys this open and diverse learning experience that the openED course provides; and she also discovers that there are foreign universities that offer credit points for the openED course within their own study programmes. Upon further investigating such offers she finds a university in the Netherlands that grants 60 credit points for the openED course. At this Dutch university the openED course is lectured as a part of an online Bachelor in Business Administration (BBA) programme. Shana contacts the Dutch university to learn more on the possibility to obtain this BBA with the Dutch university. She is told that she would be credited the 60 points, in the case that her local university would provide a letter that confirms that she mastered the openED course. Shana then could enrol with the Dutch university to study for the other missing credits. Shana is providing the requested documents and enrols with the Dutch university at a special rate that is offered to students from developing economies. At the end of her studies she not only has a Degree in Business and Management from her university in Tanzania, but also a Bachelor in Business Administration from the Dutch university.

2.2.4   Mahid from India @openSE: A Start-Up in Africa with Kenyan Partners

Mahid is the coordinator of an Indian Open Source Software project that focuses on accounting systems. Like most Open Source Software projects Mahid is keen on attracting new talents that can help to develop the project further and to promote its deployment across the globe. For this reason Mahid has been offering five Mentored Internships through the openSE framework. Interest in those internships has been high and it is difficult for him to decide whom to take on. He ultimately decides to take on five interns that come from the University of Nairobi. The reason for his decision had been that the teacher of the students has assured to also provide a close monitoring of the students and thus the risk for Mahid that the students would perform poor or drop out seems to be reduced to him. It takes the students some weeks to get familiar with the culture of the project, but after this initial period they perform very well. The students understand that there is a good local demand for such an accounting systems and by the end of their internship they propose to Mihad to set up a local business and to provide services for this accounting systems. Mihad is provided with a brief business plan, which looks very convincing to him, and thus he agrees to join into this venture

and to partner with the students. A year later the start-up is doing well and it has been a win / win solution for both of the sides involved.

2.3 Educator Cases

2.3.1 Alex from Switzerland @openED: Boosting Student Enrolment by 110%

Alex is Professor at a University in Switzerland and lectures business and management to graduate students. Competition for student enrolment is high amongst universities in Switzerland, in particular at a graduate level since each graduate student is fuelling in a good amount of money. On the positive side this competition has allowed the lectures to innovate with less institutional restrictions. For this reason Alex decides that the openED course would become an integral part of his business and management graduate program. His students are initially sceptical, but soon start to enjoy this rich and authentic learning experience that openED provides. Unlike in other course, learners at openED tend to be more committed and excited to learn and this is not different for Alex own students. For this reason Alex' students feel that learning at openED is not only providing a better learning outcome, but also makes much more fun. Word-of-mouth is a powerful marketing tool, and within the subsequent two semesters Alex sees that student enrolment at his business and management graduate program is boosting by 110%.

2.3.2 Jasper from Finland @openED: Providing Assessment and Certification on a Global Base

Providing assessment and certification against fee is a common revenue model for Finish education provider. It is often used within a lifelong learning context to allow for the formal recognition of informally acquired skills and knowledge. Jasper is working for one such education provider as a business developer and once he discovers the openED course he immediately sees its potential. He briefs his superiors about the opportunities that he sees in openED and gets green light to organize the provision of assessment and certification services to openED participants against a moderate fee. A small team is established that studies the openED course in detail to have a clear understanding on subject matter focus as well as the assessment criteria in place. With this Jasper's team is also approaching the openED course team to suggest a number of improvements and ultimately one member of Jaspers' team is joining the openED course development team. As time will show, this initial investment in

time and resources pays off for Jasper's employer and has helped them to establish a new revenue stream; and today they not only provide assessment and certification services, but also virtual individual tutoring and support to openED participants.

2.3.3   Caspar from Kazakhstan @openED: Providing local Students with high quality Learning Opportunities

High quality education is nothing to be taken as given in Kazakhstan. One of the reasons is the high price for learning materials that makes them less affordable for education providers or students. In addition to this, much of those materials come from the West and do not consider local particularities and strict copyright licenses do not allow for further localization. For this reason Caspar has been delighted about the flexibility that the openED course provides as all content is available through a creative commons license and can be adapted so to match to local needs. Casper also liked the availability of past semester students' assignments and the questions, answers and discussions available through the forums. All of those resources are of potential use for the business and management course that he is lecturing. He would have loved to see his students engaging more frequently with other learners of the openED course from across the globe, but unfortunately computer availability and internet access is still scarce and thus preventing his students from doing this. Nonetheless, he tries to make resources available as often as possible so that his students could connect to virtual peers. Given that the students can't upload all of their assignments to openED Casper is taking the time himself and does it for them. He feels that this is not only something he owes to the openED course, but having the assignments of his students peer-reviewed by others is also helping him to further develop his evaluation and assessment skills.

2.3.4   Francesca from Italy @openSE: Matching Curricula with Market Needs

To update ones courses frequently is still not very much rewarded at the university Francesca is working for. It is not only little rewarded, but also a time consuming task. And updating her course implies not only to look for updated content, but also to make sure that the content matches with actual employer needs. For this very reason alone Francesca is very happy of having found openSE. Much of the contents from other universities that are available through openSE have been released under favourable licenses that allow her to integrate such contents within her own course. But as importantly, openSE features both sides of the coin and also

has large numbers of participants from the enterprise field. This means that much of the content available through openSE is not only of a good quality, but also matches with market needs. By times Francesca nevertheless feels guilty that she is consuming significantly more contents from openSE then she is giving back to it. To compensate for this she ultimately found a way: she not only let her students learn at openSE, but also made it mandatory to them that they must provide some peer support to other learner from outside of her course. She does not consider this to be a miss-use of the students' time, since her students will learn themselves by supporting others and it would also help them to improve their communication skills.

2.3.5 Paulo from Brazil @openSE: enhancing Students' employment Opportunities

Paulo has been a lecturer in computer science education for the past twenty years and he still can recall the amount of time that he spent to phone up local businesses to make available practical placements for his students. Since then much has changed, the internet came along and then last year he found openSE. openSE is a great way for Paulo to provide his students with practical placements across the globe in the real virtual world. Not all is pink, and Paulo is clearly aware about some of the drawbacks that come along with virtual placements. His students might lack the physical interaction or really know the persons that take them on. To compensate for such potential shortcomings and to minimize students' failure Paulo is closely monitoring the performance of his students within their virtual placements, and he has also established study groups within his course to assure that students would met up regularly and to exchange experiences amongst them. Overall, he sees a gain in using openSE as the international skills that his students acquire certainly enhance their employment opportunity. From a time perspective he can conclude that the closer students' monitoring does not add an additional burden to him. The increased time that he now has to dedicate for this is the time that he safes on the phone to call up local businesses.

2.4   *Practitioner Cases*

2.4.1   Christian from France @openED: Training the own Workforce & let them look beyond their own nose

Training the own workforce of a French based insurance company is Christian's responsibility. For Christian it is as important to keep their subject matter skills up to date, as

it is important to him to have them look beyond their own nose. In older times both of this often required separated training efforts, and in business terms this means double cost. The openED course on the other hand allows to tangle both at once. Though subject matter skills are at the forefront of the course, the course itself does provide ample of opportunities to look beyond ones nose by engaging with peers from different cultures and from very different backgrounds. Christian's superiors have been initially sceptical about using such an open and public course for company internal training, but the double-cost argument has worked out and he had been allowed to give it a try. Indeed, costs have come down and outputs are as desired. The management even has made available some budget, so that Christian could enter the course team and help to update and improve parts of the course. The reason for making available this budget has however not been entirely selflessly. The management understood that only as part of the course team Christian could make sure that the course would develop in a direction that is also of interest for the training needed within his company – it's business after all and this is how decisions are made…

2.4.2 Peter from South Africa @openED: Discovering bright Minds throughout Africa to support the Company's Expansion

Battling for talents is not an unusual thing and for this reason companies often keep close relations to educational institutions. The openED course is not different to this, and Peter sees the opportunity of finding some bright minds at the openED course that potentially could be employed by him or become a business partner for further expansions abroad. For this reason Peter is signing up for the course and closely monitors the performance and behaviour of course participants from South Africa and neighbouring countries. Given that the openED course is open by nature Peter easily can spot potential bright minds; and with this he indeed finds the candidates that he has been looking for. Over the coming month he is contracting three openED course participants from South Africa, as well as establishing partnerships with some others from Mozambique, Uganda and Namibia. Surprisingly, the openED course has not only allowed Peter to find such bright minds, but it also has seduced Peter to participate at the course itself; and he feels that he learns quite a bit.

2.4.3 Chris from Malawi @openSE: Optimizing Community Management and New Member Integration into an African Open Source Software Project

Community management and new member integration is as crucial to African Open Source Software projects then to any other one. Both are time consuming efforts and therefore any mean to optimize either of them is welcome. It seems to Chris that openSE would be a way that would allow for such optimizations, as it could free up time that core developers currently spend on mundane community and integration tasks. Such mundane tasks might instead be moved into openSE. Using openSE for shared 2nd level support ultimately benefits all of the sides involved, Open Source Software projects as well as educational institutions. Chris understands that competition for bright minds is taking place at a different level, and thus he feels comfortable of guiding newcomers to openSE. The engagement within openSE indeed pays off and Chris has not only managed to optimize community management and new member integration, but he also has attracted new members from across the globe and thus laid a new stepping stone that perhaps would allow their project to reach out beyond Africa.

2.4.4 Sharon from England: @openSE: Sharing 2nd level Support and optimizing HR Time

Sharon is working for the educational programme of the ASF Apache Software Foundation and she has been one of the founding members of the openSE framework. She clearly sees the advantage of such multiple stakeholder co-operations. Educators, learners and practitioners from the Open Source Software field potentially could realize significant gains if working together. Sharon has a business background and understands that there is a difference in between 'competition in core areas' and 'co-operation within complementary fields'. Thus she is not concerned that the ASF might loose bright talents to other Open Source Software projects. Instead she believes that more of such bright talents would emerge as a result of the educational opportunities provided through openSE. The use of openSE potentially also allows to optimize HR time of ASF staff. At current, much time is consumed by explaining basics over and over again, or by providing good guidelines that smoothen the entry of new developers. A significant amount of such time is dedicated to supporting member in areas that are not limited to the ASF project itself, but that equally apply to other projects too. This is clearly duplication across projects that could be reduced; and this is what in accordance to Sharon the openSE framework would allow for.

2.5   Summary

This chapter featured a brief set of cases that illustrate how Open Education could look like in practice. Those cases covered the different stakeholders that can be found in Open Education, and the cases provided an insight of potential gains and underlying considerations on why to engage within Open Education. Chapter four of this work will discuss theoretical concepts and provide some practical guidance on how to design and deliver Open Education. Before reaching this fourth chapter, however, the aspect of sustainability of Open Education will be discussed. Open Education, like also Open Educational Resources, can be certainly seen as a desired move, as they support social inclusion and free / open access to education. The Open Educational Resource movement has nevertheless also shown that 'doing the right thing' might not be sufficient, if no solid sustainability concepts are in place to maintain all of this over time. Or in economic terms, before one might consider to read the 45 pages of chapter four, it perhaps would be useful to understand if any of the sustainability concepts that are discussed within the third chapter would be suitable. In the case none of such sustainability concepts are seen to be applicable, only the time of reading six pages have been consumed.

3   Sustainability of Open Education

3.1   Introduction

Sustainability is as important for Open Education, as it is important for traditional formal educational offers. Concrete pathways and measures to assure the sustainability of Open Education certainly will vary in accordance to the respective Open Educational scenarios, as already indicated by the cases provided within chapter two; and they would also vary depending on local particularities on how traditional formal educational systems are designed and funded. This chapter will however not look at sustainability based upon a respective educational system or educational institution; instead more broad concepts will be discussed.

Donations, advertisements, or commission on sales are all viable and well-established means of revenue generation, and they are applied successfully within and outside of the education sector. For this reason such sustainability concepts will not be a part of the subsequent discussion, though they might be also applied to support the sustainability of Open Education.

3.2   Open Education as an Element of Traditional Education

Education cost money, or not? Even in the event of free access to educational resources, such as OER ones, there are still further items that must be considered, like for example staff cost for teachers and administration, or the cost for physical premises and equipment. So if cost incur, how could Open Education possibly be offered for free?

As has been pointed out at chapter one, "Open Education is seen to co-exist with traditional educational provision and complement each other". This implies that the elements of traditional formal education, such as staff cost or cost for physical premises, would certainly require to be sustained in the way that they are sustained at current. Open Education might however contribute to optimize current sustainability approaches of traditional formal education by allowing for cost-sharing or in the best case even cost-reduction, for more value for money, or for new revenue sources as will be discussed at the subsequent sections.

3.3   Open Education at a Course Level: the 'low budget sustainable Approach'

Over the past years a number of Open Course have been emerged that all have been running successfully, and without necessarily requiring additional budgets or funding, with the main investment required being perhaps a higher-then-usual workload for the educator (Meiszner,

2010: 6, 9). This does not suggest that institutions should demand their staff to invest such extra hours, but it shows that educators who want to engage within Open Education can take actions themselves and improve the learning experience and learning outcomes of their student population. Chapter two has featured some cases that illustrate how Open Education might be provided at a course level; and for those educators whishing to become active, chapter four of this work will provide further theoretical concepts and concrete practical guides on what to consider and on how to get started. Further concrete examples of existing Open Courses, which have all been running successfully without requiring additional funding, can also be found within the work from Meiszner (2010) within the chapters six and nine.

3.4 Cost-Sharing through Open Education

Cost-sharing can be one mean to allow for the sustainability of Open Education and to optimize the use of the resources at hand. Cost-sharing in Open Education might be achieved from two different sides: from the educational provision or from the educational delivery one.

3.4.1 The educational provision Perspective

From the educational provision perspective cost-sharing could be achieved through open sharing and by using collective intelligence and 'openness' as a transfer mechanism for the production and maintenance of open educational environments, open educational resources or open research and development. This perspective considers the (co-)production of open educational resources, the use of particular tools to support their production, and strategies on how to deploy (retrieve, adapt, deliver, summarise, ...) all of this. The openSE project shows for example how to provide a framework at which a multitude of different stakeholders (educator, practitioner, formally enrolled students and free learner outside of formal education) could share educational resources, though no mechanisms for co-production have been considered within openSE at this point in time. The openED project on the other hand shows how a number of educational institutions can co-produce a course, and how the artifacts created by students could enhance such core course material. In the openED project co-production is further facilitated through modularity, as the course consists of ten modules that can be maintained or taken alone. A close coordination amongst module producers is nevertheless required to assure that the respective modules would match with the overall course outline.

3.4.2   The educational recipient Perspective

From the educational recipient perspective perhaps, again, two different angles could be considered: the technical and the human one.

The technical angel acknowledges that the learning environment is not only a condition for, but also an outcome of learning. Therefore learners should be provided with an open set of learning tools, the access to an unrestricted number of actors (learners, educators, peers, etc.), and an open corpus of artefacts, as well pre-existing core contents as those ones created as part of the learning process. All of those resources should be ideally freely combinable and utilisable by learners within their learning activities. Mash-up and personalisable learning environments would for example allow learners to build-up their own personal learning environments by composing web-based tools into a single user experience; to get involved in collaborative activities; or to share their designs with peers (for 'best practice' or 'best of breed' emergence). Such Mash-up and personalisable learning environments therefore also could help to reduce tutoring costs, though investments would need to be made for their development and maintenance – and thus it might be rather seen as a mean for cost-sharing than as a mean for cost-reduction. Both, the openSE and openED projects, show some elements of such personalisation, as both of the projects' spaces make use as well of their own environments, as they embed external spaces within their internal environments in a number of ways.

The human angel is concerned with shared tutoring or 2nd level support. Within Open Education educators, practitioners, or the learners themselves, could provide support in a number of ways. Open Education allows in principle to draw on the philosophy that 'the whole is more than the sum of its parts'. The availability of a larger and more heterogeneous learner population and of practitioners, as well as the joint efforts of educators, allow for a multitude of learner support and collaboration scenarios. The openED project shows for example how educators from different educational institutions can share the provision of learner support. The course has 10 modules and each of the modules has two assigned facilitators to provide support and to facilitate the course. This is to say that each of the openED partners is able to offer to their learner population the 10-module course, but does not need to provide support for all of the 10 modules. The openSE project on the other hand shows how cost sharing might be achieved through shared 2nd level support. openSE brings together Open Source Software communities and courses from the computer science field.

Within those two different fields a number of duplication exists; as well with regards to learner support, as for the learning resources used. As is the case for the educational provision perspective, joint efforts are seen to be a viable mean for optimized use of available resources. This is to say that duplication of efforts could be avoided, or minimized, through shared 2nd level support, to be jointly provided by practitioners from the Open Source Software field and educators from the computer science field. In addition to this, the openSE framework further provides all involved stakeholder with an access to 1st level educational resources, which are located outside of the openSE environment; either within the respective environment of the Open Source Software projects or the educational computer science institutions. This is seen to be another mean of allowing for an optimized use of resources, since duplications could again be avoided.

3.5 *Added Value to Traditional Education Offerings*

Open Education provides an added value to traditional educational offerings. From a sustainability perspective this implies a higher value for the same cost involved, or in the best case even at a reduced rate. Students in traditional formal education are typically operating in an isolated, artificial and very heterogeneous world, which is disconnected from the real physical world and from the real virtual world. To allow for real life learning, or to acquire key and soft skills, as well as experiences and practice, such an isolated, artificial and very heterogeneous world might however not be optimal. Internships or voluntary services, at a local level or abroad, are today well-established means within traditional formal education to allow students to acquire real life skills, experiences and practice, and to broaden their horizon. Whether Internships or voluntary services, what both have in common, is that they require the use of additional resources; most notably time and perhaps also money for re-allocation that a student has to invest. The larger stakeholder group, and the possibility to embed and make use of well-established virtual communities of practice, allow Open Education to provide students with real life learning opportunities, without necessarily consuming such additional resources from them. The openSE project shows for example how learners can engage within virtual mentored internships. In the openSE case, students from computer science classes are provided with the opportunity of mentored internships within Open Source Software producer communities. Within closed and formal traditional settings this likely would not have been possible. Similarly, the openED course allows students to get in contact with fellow students and practitioners from across the globe. In this sense, the

openED course is close to studies abroad, but without the need of physical reallocation. The openSE as well as the openED cases therefore illustrate well how Open Education could provide an added value to formal traditional education.

3.6 Revenues through Open Education Services

Open Education allows for the set up of new business, financing and revenue models that, for instance, generate revenues on individualised educational efforts and curricula, instead of highly formalised and standardised catch-all services that characterise traditional educational institutions. Open Education is an enabler for service provision, and thus an alternative revenue model to traditional product sales, like for example learning-material publishers that usually would generate their revenues through such product sales. Analogue to the Open Source Software case, Open Educational Service concepts would allow for a move away from seeing education as a finished product to be sold and consumed (Fischer, 2007), towards a more timely service based education economy. The Open Educational Resource move, and the usage of respective open licenses, has created a favourable situation that in principle supports such a service-based approach within the education domain. Open Education Services include also opportunities for learners to participate in open educational arrangements 'free of cost', since financial sustainability can be achieved through traditional and service-based revenue components. Moreover, in Open Education it is desirable to have such 'free learner' participating, as those not only add a value to the education offering (see 3.5), but 'free learner' are also potential customer that might would subscribe to available Open Education Services. Thus, Open Education can draw as well on traditional revenue models, based on enrolment and tuition fees, as it can draw on new service-based revenue models like for example, in-class support, virtual tutoring or assessments and certifications against fees.

Open Education Services are not limited to the learner perspective, but could also be provided to educational institutions. Outsourcing and cloud-sourcing services are today well-established concepts in many domains that also could be provided within the Open Education domain. The openED project for example has introduced such Open Educational Service concepts. The openED course environment features an 'Extra Service Directory', at which educational providers can promote any type of offers around the openED course. At this point in time, in-class support, virtual individual tutoring or assessment and certification have been considered as possible service offers. As the openSE project however shows, a number of

further services might be considered. Market-place concepts for virtual mentored internships, with individual assessment and certification of what has been learned; 2nd level support as a service to educational institutions; outsourcing and cloud-sourcing of institutional course environments; or learning resource updates and optimization are all opportunities for Open Education Service provider. The opportunities for Open Education Services are manifold, and therefore the above outline is not deemed to be exhaustive, but rather to be understood as an initial set.

3.7   Summary

This chapter has discussed a number of pathways and measures that could be deployed to allow for the sustainability of Open Education. Cost-sharing, added value for money, or the provision of Open Education Services are three concrete means that could be deployed isolated or in conjunction to allow for the self-sustainability of Open Education. Such sustainability concepts further would allow the provision of Open Education 'free of cost', or at least 'free of cost' in its very basic form and within given limitations. Given that sustainability of Open Education potentially could be assured, the following fourth chapter will now finally provide some theoretical concepts and practical guides on how to design and deliver Open Education.

4   Designing & Delivering Open Education

4.1   Introduction

This chapter is concerned with the 'How' question: How to embark on the Open Education journey? The chapter provides theoretical considerations and practical guidance for the design and delivery of Open Education. Those theoretical considerations and practical guidance have been derived from three different sources.

The first source concerns mature and well-established online learning ecosystems, like for example Open Source Software communities, and the way they operate and function as educational ecosystems (Glott, Meiszner & Sowe, 2007; Meiszner et. al. 2008; Meiszner, 2010; Weller & Meiszner, 2008). There are a number of analogies between the former and the latter, like for example organization aspects of such open and participatory learning ecosystems, the type of learning resources featured, associated learning technologies, underlying pedagogies, learning opportunities and activities, the communities and stakeholders participating at it, individual motivations to participate and the different roles assumed by participants, or the added value of such open approaches, the opportunity for cost-sharing and a service based revenue approach.

The second source draws on existing Open Courses in traditional formal education (Meiszner, 2010: 6, 9), and it also draws on the Meta-design framework (Fischer, 2007) and its underlying SER (Seeding, Evolutionary growth & Re-seeding) / Courses as Seeds process model (de Paula et al. 2001), which can both support Open Course design and delivery (Meiszner, 2010: 5). As has been highlighted at chapter one, and recalled at chapter three, Open Education is understood to be a complementary part of formal traditional education. Analogue to this, Open Education design and delivery is not a synonym for abolishing traditional educational practices, as we know them, but instead about finding the right balance 'in between'. From this second source it can be learnt that there are a number of traditional course design and delivery principles that might be retained, and that should form the base upon which Open Course design and delivery builds, such as for example structuredness, guidance, or clearly articulated outcomes to be delivered, such as assignments.

As a third source, this chapter draws on piloting works that have been carried out within the FLOSSCom (2006-2008), the openSE (2009-2011) and openED (2009-2012) projects. In those projects the knowledge and experiences from the first two sources had been put into

practice. Such piloting work has allowed for a more thorough reflection, analysis and modification of the assumptions that emerged from sources one and two.

4.2   Inside, Outside and Hybrid Perspectives to Open Education

Open Educational scenarios might be differentiated by 'inside', 'outside' or hybrid approach (Meiszner, 2010: 6,8,9). The following three sections will introduce each of the three approaches, by focusing on Open Education at a course level.

4.2.1   The inside Perspective

Within the inside approach (Meiszner, 2010: 6.2, 6.3, 8.1, 8.5, 8.6, 8.7) some principles as also inherent within well-established and mature online learning ecosystems, such as the Open Source Software case, are applied within the (higher) education context. The 'Meta-design' and 'Courses as Seeds' process model (Fischer, 2007) is one example for a structured attempt of the inside approach and aimed at supporting self-directed learners within virtual learning communities by creating socio-technical environments that support new forms of collaborative design. Fischer (2007) talks of users creating socio-technical environments and as a continuum of participation ranging from passive consumer to Meta-designer. Key stakeholders within the 'inside approach' are formally enrolled students and the educator, with practitioners assuming no real importance and free learners outside of formal education or fellow students institutions being at the very least allowed to observe. This is to say that the general public is at the minimum allowed to view what is going on within the environment, but might also be allowed to participate and engage in this environment. Allowing for such type of participation or engagement would likely be a first step towards a hybrid approach. Depending on the degree of openness, for example open to view, open to consume, open to participate, open to change, the outside world remains largely or totally disconnected from the inside one, the course 'community'. An inside approach that would only allow outsiders to view, but not to participate, therefore would limit the opportunities to establish a course 'community' and 'evolutionary growth', since a given course could only draw its own student population (Meiszner, 2010: 6.2, 6.3), that has (a) a 100% student turnover per semester / course and (b) a comparatively small number of potential community member (formally enrolled students of a course). Within such an inside attempt the educator retains the control about organizational structures and processes, or even access rights. For this reason the inside

approach might be relatively moderate to implement since the technology should be already in place at most Higher Education institutions, or available at low or no cost. On the down side this approach would still keep the students of the institution within this learning environment preventing their semi-structured engagement and collaboration within the wider Web. It would also limit the opportunities of 'best of breed', as the wider Web might provide better technological solutions, practices, or already established and mature communities for respective study fields.

4.2.2 The outside Perspective

Within the 'outside approach' (Meiszner, 2010: 6.4, 6.5, 8.1, 8.5, 8.6, 8.7) educators would send out their students into already well-established and mature learning ecosystems to engage in and collaborate within those communities on pre-defined tasks. In contrast to the inside approach, the outside approach takes traditional education as the starting point by providing theoretical information 'in-class' and then sends the students 'outside' to find well-established communities, such as the Open Source Software ones or Wikipedia. Students then would work within those communities and apply and deepen their theoretical knowledge. Main stakeholders of the outside approach are therefore formally enrolled students, the educator and practitioners of the outside communities involved, with 'free learners' likely being present within the outside world, but not integrated into the overall course structure. The students are provided with an initial academic background and then required to choose and engage within well-established and mature online learning ecosystems. This clearly has benefits as it gives students real experience of collaborating with practitioners and to gain real life practical experience of collaboration, an authentic learning experience and allows them to acquire an enhanced set of skills than they would have acquired in traditional class settings (Meiszner, 2010: 6.4, 6.5, 9.2, 9.3, 10). The outside approach can be realized whenever there is an external, 'real' community that is operating on principles that allows for production activities, with openness being the main criteria that must be met. The outside approach might be the least complex and almost cost neutral; and therefore relatively easy to implement. One of the drawbacks of the outside approach is that the results of students' collaborative learning and knowledge production very likely would remain within those outside ecosystems and therefore would be lost for future students, or at least could not be easily detected. The outside approach therefore does not provide next year's students (newbies) with an easy access to the prior knowledge created by the former students. The use of external spaces and communities

comes also at the price of giving up control and certainty, an aspect for which one needs to be prepared and to be taken into account.

4.2.3 The hybrid Perspective

A hybrid approach to Open Course design and delivery (Meiszner, 2010: 8.1, 8.5, 8.6, 8.7, 9, 10, 11) is aimed at connecting the 'inside' and the 'outside' worlds in a more structured way and is close to the concept of 'open participatory learning ecosystems' as outlined by Brown & Adler (2008). Within the hybrid approach some of the principles of well-established and mature online learning ecosystems are adopted within the inner course, such as collaboration, use of technologies, peer production. People learn by doing, for example by remixing or re-mashing content that is viewed by others. However these activities occur in a broader ecosystem that is open for everyone and that aims to integrate the 'outer world' in a more structured manner within the overall course. Stakeholders of a hybrid approach consist consequently off all stakeholder groups: own students and the course team, free learners outside of formal education, practitioners and perhaps also fellow students and educators. Hybrid Open Courses might make use of a number of environments, spaces and communities where students could engage at in a semi-structured way and where guidance and support is provided through the use of technologies (for example RSS, suggested contents, etc.) and the use of the human factor (for example knowledge brokers, community support, etc.). Hybrid Open Courses should also aim to meet the interest of both sides involved, the educational one as well as the outside communities involved (Meiszner, 2010: 10.5.5), as well as the willingness to accept and draw on established best practices. This might be achieved by mapping and integrating the methodologies, tools and practices already used and well established of the outside communities involved, instead of formal education trying to set up a "parallel universe" itself (Meiszner, 2010: 10.5.5). To allow for continuity, connectedness, transactive group memories or re-use and re-seeding one might need to look at courses beyond the semester term and instead look for means to grow such hybrid educational spaces by connecting the various stakeholder groups and therefore to gradually achieve that a "critical mass builds on-line" (Meiszner, 2010: 10.5.5.4). "Being like the community" however is likely a novel way of working for teachers and therefore perhaps requires also a paradigm shift on how one sees formal education (Meiszner, 2010: 10.5.5.4). The openSE and openED projects provide an insight on how such hybrid scenarios might look like in practices.

4.2.4 Comparative Overview: Inside, Outside and Hybrid Approach

The Table 4-1 suggests key characteristics of the inside, outside or hybrid approach and briefly outlines their potential strength or limitations. The characteristics presented at Table 4-1 for the inside and the outside approach have been derived from case studies (Meiszner, 2010: 6), with the characteristics of the hybrid approach being derived from as well case studies (Meiszner, 2010: 9) as from practical experiences gained from the openSE and openED projects.

Open Educational Scenarios: Inside, Outside & Hybrid Approach			
	Inside	Outside	Hybrid
Open Learning Environment / Ecosystem			
Higher Education institutional virtual space(s)	X		X
Outside virtual community space(s)		X	X
Interactions			
Face to Face on campus	X - of 1 institution	X - of 1 institution	X - of various participating institutions
Virtual	X	X	X
Learning user groups	At an internal course level	At an internal course level	Physical at a internal course level or through self-organized study-groups. Virtual through self-organized and/or guided learning groups.
Level of Openness			
Static Content	Educator/Student	Educator/Student &	Educator/Student, Free learner

(Core course content)	can edit / Free learner can view, might even allow outsiders to participate to some degree	practitioner can view & edit	& practitioner can view & edit, though limitations might be in place to assure consistency and quality of the course.
Dynamic content (for example discourse or artifacts to be created by students, such as assignments)	Educator/Student can edit / Free learner might view, might even allow outsiders to participate to some degree	Educator/Student can view & edit within the inside space. Educator/Student & practitioner can view & edit within the outside space	Educator/Student, Free learner & practitioner can view & edit
Participation	Educator/Student can edit / Free learner likely not, but might even allow outsiders to participate to some degree	Educator/Student can participate within the inside space. Educator/Student & practitioner can participate within the outside space.	Educator/Student, Free learner & practitioner can participate
Characteristics			
User generated content	Educator/Student - rather small scale – except if allowing outsiders to participate	Educator/Student & practitioner - potentially large scale	Educator/Student, Free learner & practitioner - potentially very large scale
Peer production	Educator/Student - rather small peer group – except if allowing outsiders	Educator/Student & practitioner - potentially larger peer groups and / or higher	Educator/Student, Free learner & practitioner - potentially high number of peer groups and break down in sub-groups

	to participate	number of groups	working on particular subjects / projects. Sub-groups might consist of formally enrolled students only, or mixed groups
Contribution to the process	Educator/Student - rather limited and rather structured	Educator/Student & practitioners - though the later might assume a dominating role as the student has a fixed entrance and exit date and therefore might be seen rather as a "Newbie"	Educator/Student, free learner & practitioners. Practitioners might assume a dominating role, analogue to the outside case
Greater sharing of knowledge	Educator/Student - rather limited – except if allowing outsiders to participate	Educator/Student & practitioner - potentially large scale	Educator/Student, Free learner & practitioner - potentially very large scale
Connection of content & discourse	Only if earlier and future students are involved in current students' activities – for example earlier students as mentors, future students as lurkers	Yes, though based at the Web and therefore might be disconnected for future students, or at least requires them to figure out the connection themselves. Earlier and future students might be involved in current students' activities to allow a connection - for	Very likely since this scenario involves as well formally enrolled students, from various institutions, as free learners outside of formal education and practitioner. Students from different institutions might also have different start and end times that could foster continuity. An equilibrated ratio of students, free learner and practitioners might further lead to continuity and

		example Earlier students as mentors, future students as lurkers. Students are only "guests" at the outside space and therefore the space is not shaped for their needs	evolution.
Peer support	Educator/Student - rather limited, except if allowing outsiders to participate	Predominantly by practitioners	Educator/Student, Free learner & practitioner - potential for robust support structure
Peer assessment	Educator/Student - rather limited	There might be a peer assessment, either unorganized by practitioners or organized by other students	Two types of peer assessment: can be unorganized or as well organized and provided by practitioners, other students or free learners
Real activities	Educator/Student - rather limited	Educator/Student & practitioner - potential for engagement in real activities	Educator/Student, Free learner & practitioner - potential for engagement in real activities
Personalized learning experience	Educator/Student - rather limited / Free learner can 'consume' what they are personally interested at – might also be allowed to	Educator/Student & practitioner - potential for personalizing the learning experience	Educator/Student, Free learner & practitioner - potential for truly personalized learning experiences

	participate		
Informal learning	Yes, but potentially limited	Formal and informal learning - formal learning clearly structured	Formal and informal learning - formal learning more unstructured
Use of technologies	Limited to available institutional tools, respectively course' tools	Limited to available tools used by outside community, though students can select the outside environment and therefore indirectly also the type of tools.	Large and diverse range of involved tools and spaces, based "out" at the Web as well as across participating institutions. Likelihood of having "champ hosts" for different modules that could be institutional or existing web-communities.
Speed of innovation and evolution	Likely rather slow	Depending on outside community, potentially faster than inside approach	Fast, perpetual beta
Speed of learning	Likely fast	Depending on outside community, potentially slower than inside approach	Depending on the learner and type of support provided for formally enrolled students. Likely slower for newbies, but faster for ICT literate learner
Scope of learning	Limited, predictable	Enhanced, fairly predictable	Widest, with guaranteed minimum scope for formally enrolled students depending on institutional guidance
Unique Selling Points (USP) / Key features	*Transparency of environments improves quality *Meets social	*Real life learning with resulting higher degree of soft skills, key and practical skills	*Transparency of environments improves quality *Meets social responsibility

responsibility *Possibility to attract higher number of future students (that might also match better - "know before what they buy")	*Enhanced employability chances as a result of the points above *Opportunity to meet future employer	*Possibility to attracts higher number of future students (that might also match better - "know before what they buy"). *Real life learning with resulting higher degree of soft skills, key and practical skills *Enhanced employability chances *Opportunity to meet future employer *Allows for new HE business models - for example learning for free as you go, pay for services (f2f classes, formal assessment, degrees) *Allows for niche courses and identification of rising stars at lower costs.
Examples		
	Meiszner 2010: 6.2, 6.3	Meiszner 2010: 6.4, 6.5	Meiszner 2010: 9.2, 9.3, openSE & openED projects

Table 4-1: Application scenarios of open educational approaches

4.3   A Framework for Open Course Design & Delivery

As pointed out at the introduction of this chapter, there are a number of traditional course design principles that might be retained, and that Open Course design and delivery perhaps should build on top of those; such as the structuredness, guidance, or assignments provided within traditional courses. The Meta-design conceptual framework and its Courses as Seeds / SER process model appear to be a suitable mean to approach characteristics desirable for

Open Education, without giving up on established best practices from traditional formal education.

4.3.1 Meta-design & Courses as Seeds / SER

Meta-design framework and the Courses as Seeds / SER process model both consider advantages of online learning ecosystems, such as the Open Source Software one. The Courses as Seeds / SER process model, for example, can serve as a transversal Meta layer to support a course design and delivery that would foster continuous improvement of processes and products: the initial seed of the course, its growth during the lectured period, up to the reseeding phase at which the created knowledge, structures and processes would be organized, formalized and generalized, before the circle starts again (Meiszner, 2010: 5, 10, 11). Within an optimal hybrid organizational framework for Open Course design and delivery, the SER (seeding, evolutionary growth, re-seeding) process would be an integral and almost automated part, so that by the end of a course a reseeding has been already taken place; analogue to the Open Source Software case, where the individual production activities result in the release of the next software version (Meiszner, 2010: 10). Nonetheless, existing Open Course cases (Meiszner, 2010: 6, 9) have shown the need to advance on the practical applicability of some theoretical considerations of the Courses as Seeds / SER model, in particular those ones relating the concept of 're-seeding' a course. The openSE and openED projects have been – inter alia – dealing with this problematic and the following two sections provide some potential pathways, to support not only the seeding and growing phases of a course, but also the re-seeding phase.

4.3.2 Modularity as a Mean to foster Seeding, Evolutionary Growth & Re-seeding

In the Open Source Software case (Meiszner, 2010: 2.9) modularity helps to reduce systemic interdependencies between different files of the same product, allowing a higher level of task partitioning and a lower level of explicit coordination and interaction among programmers. Modularity might be achieved through a clear division of labour between the core product and more 'external' features such as modules, add-ons or plug-ins (Mockus et al., 2002). From a product perspective modularity increases flexibility and comprehensibility, allows for a reduction in development time, provides well-defined interfaces to ensure smooth interaction of the various contributions (Stürmer, 2005). From a learning perspective modularity fosters

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community building, allows participants to engage in smaller sub-projects that can be either integrated into the product (like contributions, modules, plug-ins, extensions), or are of a supportive nature (like manuals, live demos, how-to guides, translations), or allows for participation at a lower time commitment or with less skills and therefore lowers the participation burden (Stürmer, 2005). Modularity plays not only an important role to reduce complexity or to lower the entrance burden, but additionally helps to provide a certain structure, to conveniently identify what one is looking for, or to find prior discourse that for example relates to a single module (Meiszner, 2010: 2.4), be it through individual's own search actions, or be it by being pointed to those sources by other community members (Meiszner, 2010: 2.6). Much of the ongoing discourse in Open Source Software clearly relates to for example 'a product to be developed', 'a task to be fulfilled', or 'a solution to be found for a problem' (Hemetsberger & Reinhardt, 2004, 2006; Hemetsberger, 2006), with all of those interactions being embedded within the respective Open Source Software ecosystem and being kept in a context due to a combination of technological solutions in place (Meiszner, 2010: 2.2) and individuals acting as knowledge and information broker (Meiszner, 2010: 2.8). The aspect of modularity is not limited to the Open Source Software domain, but can also be seen in other major online projects, such as Wikipedia (Swartz, 2006). Modularity therefore contributes at different levels; like providing an easy entrance, offering a large variety of opportunities to participate, or facilitating collaboration and production (Meiszner, 2010: 2.4). Modularity further enables new developers to learn their skills and work practice by developing code that extends the system's functionality, but does not interfere with its core functionality (Tuomi, 2005). This not only fosters their social integration, but also allows such new developers to contribute and to become content and knowledge creators. Therefore modular approaches, in which less skilled people are provided with the opportunity to enhance 'non-core' functions, are beneficial in at least three ways: (1) it allows new and less skilled participants to become knowledgeable practitioners, (2) it fosters social integration and community building and (3) the artifacts created by those new and less skilled participants still add a value to the Open Source Software project itself, but do not interfere with the core.

Within an Open Course scenario a core might relates to 'core course components', with modularity referring to either course modules suitable to be studied alone (see openED project), or modularity referring to the students' works (see openSE & openED projects), such as working on concrete projects, or similar types of assignments, that all result in a concrete deliverable to be developed and submitted and that then would add a value to the core itself.

Open Education can further draw on a larger and more heterogeneous stakeholder base then closed traditional formal education; and therefore participants potentially could contribute their different sets of skills and act as co-designer to the overall course development through the creation of, for examples, spaces or content, and they could voluntarily decide which role(s) they want to play or which responsibilities to take on (Meiszner, 2010: 9.3.4). Given the right level of modularity participants could take on a diverse set of roles beyond content and course creation, such as information brokerage (even amongst language domains), support provision, to self-organize their activities in their own spaces of choice, act as domain experts, or to become teachers to others.

4.3.3 Bridging Discourse and Learning Materials through Learner' Productions

Besides modularity, Open Course design and delivery should allow for clearly outlined learners' production activities, such as assignments (see openED project) or project reports (see openSE project). As illustrated at the former section, there are a number of production activities that participants could take on and which all seem to be desirable. However, more clearly outlined products to be delivered by the learner, like for example assignments or project reports, and a respective environment that allows for a systematic availability of such products, could serve as a mean to clearly relate individual production activities and discourse to the core course learning resources. Clearly outlined products could thus serve as a bridge between the instructional and learning resources provided by the course team ('static' and 'core' content) and the products, discourse and artifacts created by the students. This is very well in line with the Meta-Design framework that does not aim to provide the learner with a finished set of expert developed 'static' content to be consumed only, but instead, it expects the learner to actively embed the artifacts they create within the course environment and to link to external sources and spaces involved (de Paula et al., 2001; Fischer & Sugimoto, 2006; Fischer, 2007; Scharff, 2002; Staring, 2005). Such a concept therefore could facilitate keeping learning resources (initial ones as well as those leveraged into the course by the students), artifacts created by students and underlying discourse within a context and structure that would allow future cohorts of students to re-experience, build on and improve what others did. The concept could facilitate the 'seeding, 'growing' and notably 're-seeding' of a course, as aimed by the 'Courses as Seeds' process model (de Paula et al., 2001).

The openSE and openED projects have implemented this concept through – inter alia – the use of directories. In the openSE case learners are required to submit a project report and

supplement information on what they have learnt during the practical work that they have done within Open Source Software projects. The openED project equally requires learners to make their assignments available within such directories. In both of the projects additional functionalities have been implemented to take further advantage of the learner products: (1) the products can be rated and commented by any type of users. This allows for peer-evaluation as well as for formal evaluation through educators (openED) and/or practitioners (openSE & openED). The availability of such information potentially allows other students to understand what is seen to be of good quality, what to consider, or how to present their work; (2) the products can be related to a given course module (openED) or to a given task within an Open Source Software project (openSE). This helps students to better understand what they are expected to do; (3) the products can serve as a bridge to relate forum discussions to course modules (openED) or practical tasks (openSE); (4) the products bridge the internal environment with external spaces, (5) the products can serve to allow for some type of recognition and validation. In both, the openSE & openED case, participants can generate a self-print certificate that provides information on what the learner has produced and delivered. Such self-print certificates could also include other information, such as peer-evaluations as well as formal evaluations, etc.; (6) the products and all related information could be integrated into a mobile online learner portfolio and thus allow for unified information independently of the respective learning ecosystem at which the learner had engaged at.

Finally the 'online concept' of such learner products is perhaps not a real novelty, as it corresponds well with the 'offline practice' of students' passing on all type of information of 'the things they have done' from one semester to another, which is a well established tradition in formal education.

4.4   Basic Considerations on hybrid Open Course Design & Delivery

This section will address some of the fundamentals to hybrid Open Course Design and Delivery that should be taken into account, unless future research would advice other. Such considerations are backed by the three sources that have been detailed within the introductory section of this chapter.

4.4.1   Semester based Concepts vs. the Learning Community Idea

One of the biggest challenges perhaps relates to how one defines formal education and the nature of courses, with 'being like the community' presenting perhaps a novel way of working for teachers and therefore might also require a paradigm shift on how one sees formal education (Meiszner, 2010: 10.5.5.4). Semester based concepts conflict almost 'per se' with the community idea that usually requires continuity (Meiszner, 2010: 10.4.4, 10.5.5). One of the main differences between traditional education, even if talking about currently existing Open Courses (Meiszner 2010: 6, 9), and established and mature virtual learning ecosystems, such as the Open Source Software one, is that the former starts and ends at a predefined date and the latter provides continuity and allows for evolution over time. Such continuity and evolution are however required to allow for desirable characteristics such as a transactive group memory (Meiszner, 2010: 2.4) or the possibility to get in contact with more experienced community members (Meiszner, 2010: 2.6, 2.8). Though similar conditions can be established within the traditional semester based concept (Meiszner, 2010: 9.3, openSE & openED project), a course should provide means that would foster continuity and evolutionary growth at a community level. This is to say that means should be established that allow for the involvement of past year participants, such as formally enrolled students, free learner or practitioners, at the current course edition. One way to achieve this would be for example to allow all type of learners to work on their products, be it assignments, project reports or else, beyond semester terms.

4.4.2   The Role of traditional Course Design and the 'Core'

Prior findings (Meiszner, 2010: 6, 7, 9, 10, openSE & openED projects) suggest that the structuredness of traditional courses might be maintained with regard to clearly articulated learning objectives and outcomes, instructional materials, a set of learning materials that would allow to master the course, assignments and practices, and lectures or tutorials. Analogue to the Open Source Software case such 'basics' might be described as the 'core' (Meiszner, 2010: 2.3) that perhaps should only be editable by 'core developers', like for example the course team. The role of the 'core' is therefore to assure a certain level of structuredness and to facilitate coping with less control and constant change (Meiszner, 2010: 12.1.4).

4.4.3   Openness & Inclusivity

Commitment to 'openness' (Schmidt & Surman, 2007) or 'inclusivity' is a pre-requirement to any type of hybrid Open Course provision, with the respective degree to vary within certain borders. Openness and inclusivity means that those who want to join do not have to pass enrolment procedures or have to pass formal performance assessments. Openness not only allows free access to everyone and inclusivity, it also fosters transparent structures since the learning ecosystem is openly accessible, providing access not only to learning resources, but also communications, discussions and interactions, for example through forums, mailing lists or chats sessions. However, openness and inclusivity might be limited within a number of ways. To assure assessment of formally enrolled students, 'openness to change' might be limited for the works that formally enrolled students engage at, with inclusivity being perhaps limited with regards to guaranteed support provision through educators being available for formally enrolled students only.

4.4.4   An extended Group of Stakeholder to be involved

Hybrid Open Course scenarios potentially involve an extended number of stakeholders as detailed at section 1.2, such as (1) fellow students and educators, (2) 'free learners' outside of formal education and (3) practitioners. Each of those stakeholder groups should be carefully considered and how they might impact the course or engage at it, or which type of co-operation and collaboration agreements might be established:

- For the case of fellow students and educators, this might be the least problematic case, given that both originate from traditional formal education and therefore would likely have the same needs or expectations (see also Meiszner, 2010: 6.3)

- Free learners not formally enrolled at the course on the other hand might be a group that is less common for traditional educational settings and might have different expectations of what to get out and motivations why to participate than their counterparts (see also Meiszner, 2010: 9.2, 9.3). Free learners might be only consumers that like to view what is going on at a course or engage in self-studying activities only (Meiszner, 2010: 6.2). They might however be active course participants and follow the overall course or some of its parts and enter or leave at any moment (see also Meiszner, 2010: 9.2, 9.3).

- Practitioners are regular participants of a given online ecosystems and their communities that might be involved within an Open Course scenario and could impact the course in a number of ways (see also Meiszner, 2010: 6.4, 6.5, 9.2, 9.3, or 10.5).

4.4.5   Less Control and constant Change

The involvement and use of external spaces or communities within a given Open Course might come at the price of giving up a certain degree of control or certainty (Meiszner, 2010: 6.4, 6.5, 9.2, 9.3, or 10.5). External communities and spaces have their established structures, practices, rules or culture and formally enrolled students that wish to engage with those would be required to behave in accordance (Meiszner, 2010: 6.4, 6.5, 10.5, 10.5.5). External spaces might also relate to individual ones established or maintained by course participants themselves and brought into the course as a part of their active co-designer role (Meiszner, 2010: 9.2, 9.3), but analogue to the case of external communities the ownership and control remains with those course participants and not with the course team. This might be considered within Open Course design scenarios and therefore 'core' course components should preferably be kept within the control of the course team.

4.4.6   External Co-operation & Collaboration Considerations

Embedding external and well-established online ecosystems and their communities within Open Course scenarios comes as well with advantages as potential drawbacks. Potential drawbacks are a lower degree of control of those external spaces (Meiszner, 2010: 6.4) or a non-optimal use of resources, be it of a human, technological or learning resource nature (Meiszner, 2010: 6.5). For this reason it might be possible to agree on certain types of collaboration and collaborations (Meiszner, 2010: 10.5.5), or at the very least to be well aware about the way those ecosystems and their communities function and what the potential risks are. The same holds valid for courses of fellow institutions that might form a part of a given Open Course, though likely cooperation and collaboration options are more predictable, as can also be seen at the openED pilot course, in comparison to external and well-established online ecosystems and their communities. Though cooperation and collaboration arrangements should be considered, none of the existing Open Course cases reviewed (Meiszner, 2010: 6, 9) has shown that those arrangements would be preconditions as long as the 'core' course remains within the control of the respective course team.

4.4.7   Legal Aspects

Though legal aspects appeared to be marginal in all of the Open Course cases reviewed (Meiszner, 2010: 6, 9) and also within the FLOSSCom, openSE or openED pilot works, they might turn out to be a major challenge and could be of any nature, such as licensing, copyright, quality assurance, or formal degree and certification aspects. Therefore they should be taken into account from the very start.

4.5   The Component Parts of Open Education

This section will provide a introduction to the component parts of Open Education, with each of those component parts being discussed more in detail within the subsequent section that provides a guide to Open Course design and delivery. Some of the following consideration are backed by strong evidence, such as the need to keep a certain type of structuredness and guidance, or pre-conditions that must be in place at an internal course level such as openness, or how external aspects might be considered such as the use of external spaces or communities. Other consideration can only draw at anecdotal evidence or theoretical considerations. Consequently the guide presented in this chapter will differentiate between the former and the latter using the following classification:

- *'Keep'*

'Keep' refers to fundamentals of traditional course design that might be kept unless differing evidence would become available that suggest otherwise.

- *'Change'*

'Change' refers to identified pre-requirements that must be established within the course environment to create the basic conditions for any type of Open Course scenario. 'Change' therefore presents an inside view on conditions that must be established within the internal course space.

- *'Integrate'*

'Integrate' refers to external organizational aspects and how those might be integrated into the overall course. 'Integrate' therefore present an outside view on how external spaces and communities might be integrated within the course space.

- *'Consider'*

'Consider' refers to aspects that provide a potential benefit within Open Course scenarios, but for which no clear evidence exists on how to actually implement those aspects, or aspects that might come at the risk of giving up a notable level of control.

The classification by 'Keep', 'Change', 'Integrate' and 'Consider' aims at allowing educators to clearly understand and distinguish between necessary pre-conditions, 'Keep'-'Change'-'Integrate', for Open Course design, or desirable elements for which no clear information and evidence could be provided on how to establish those conditions and to assure their functioning in practice.

The following layers that form the component parts of Open Education design and delivery, though it is not claimed that those layers are all-inclusive, but rather that they present an initial set on which to build.

4.5.1 Content Layer

The content layer includes course materials as it can be found in traditional education, such as the more static instructional & learning resources, but also those artifacts created by course participants, be it the things they produce, the resources they leverage into the course space or the underlying discourse. The content layer therefore is closely linked to the learning and the technical layer.

1.1 Static resources internally provided

Those are the resources that are typically provided within traditional course settings (Meiszner, 2010: 3.6, Andres 2002, Dean & Leinonen, 2004, Fischer 2007, Tuomi 2005). They are well designed and include clear learning objectives and pathways towards achieving those. They can be as well of a theoretical academic or of a practical nature.

1.2 Static resources externally provided

This relates to the resources provided by external communities or other spaces. They might be leveraged into the course space by any of the stakeholder groups, the educator (Meiszner, 2010: 6.2, 6.5, 9.2, 9.3, 10.5), formally enrolled students (Meiszner, 2010: 6.2, 6.3, 6.4, 6.5, 9.2,9.3), or practitioners and free learners outside of formal education (Meiszner, 2010: 9.2, 9.3).

1.3 Dynamic resources

Dynamic resources would typically consist of the collaborative production activities and associated discourse, or the discourse associated to other study activities, such as debates or collaborative inquiries (Meiszner, 2010: 2.2, 2.3, 2.5, 2.8,2.9, 3.4, 3.6, 6, 9, 10, Brown & Duguid, 1991; de Paula et al., 2001; Fischer, 1998; Glott et al., 2007; Hemetsberger & Reinhardt, 2006; Weller & Meiszner, 2008).

4.5.2 Teaching / Lecturing Layer

This layer refers to the actual lectures and also includes listen / understand or questions / answers components, this is a fairly dynamic layer and in traditional class based settings most of this layer might not be preserved (Meiszner, 2010: 2.4, 2.5, 3.6). Within an Open Course context the teaching / lecturing layer must also consider the different types of stakeholders involved, such as:

2.1 Educator / Lecturer layer

This refers to the educators / lecturers as to be found in traditional classes and their role as being the domain experts for theoretical academic aspects and the course at large (Meiszner, 2010: 6.2, 6.3, 6.4, 6.5, 9.2,9.3).

2.2 Practitioner layer

Practitioners are regular participants / members of the outside spaces and communities that are associated to a given Open Course (Meiszner, 2010: 6.4, 6.5). Practitioners might take on well-defined support roles such as for example mentoring (see openSE project), or they might provide support and assistance on a more fluid and ad-hoc base. Practitioners might focus more on practical course elements and how theoretic knowledge might be applied within a specific context or situation.

2.3 Peer layer

Peers could be either other students that are formally enrolled at a course (Meiszner, 2010: 6.2, 6.3, 6.4, 6.5, 9.2,9.3), they could be fellow students (Meiszner, 2010: 6.3), or they might be free learners outside of formal education that engage within the Open Course or associated spaces (Meiszner, 2010: 9.2, 9.3). The role of peers might be the same one than the role of practitioners; this is to say that they might engage as well at theoretic academic areas as on the more practical ones and therefore might act as a bridge between the former and the later (Meiszner, 2010: 9.3).

4.5.3 Learning Layer

The learning layer refers to all learning processes and associated activities. As for the teaching / lecturing layer much of this layer might not be preserved within a traditional class based setting (Meiszner, 2010: 3.6).

3.1 Pedagogical layer

Considers the different pedagogical approaches suitable for Open Course scenarios, such as self-directed learning, cooperative learning, problem, case, project and inquiry based learning or reflective practice (Meiszner, 2010: 3.2, 3.3, 3.4, 3.5).

3.2 Assignment & Practice layer

This layer refers to the students' works on their respective assignments, individually or as a group, and is a relative dynamic one (Meiszner, 2010: 6.2, 6.3, 6.4, 6.5, 9.2, 9.3, 10.4, 10.5). The assignment & practice layer should allow participants to produce concrete outcomes and preferably fit into modular course structures to facilitate that artifacts created by students and the underlying discourse could become an integral part of the course and that all of this would be embedded within a clear contexts (Meiszner, 2010: 2.3, 2.9, 5, 6, 9, 10, Brown & Duguid, 1991; Fischer, 1998; de Paula et al., 2001; Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006).

3.3 Studying (silent) layer

The studying layer might be described as a largely invisible and therefore as a silent layer. Through collaborative activities such as questions and answers, reflections, or other dialogues it could become however visible (Meiszner, 2010: 2.4, 2.6, 2.8, 5, 9.2, 9.3, 10.2, Brown & Duguid, 1991; de Paula et al., 2001; Hemetsberger, 2006; Norman, 1993). Within an online context such discourse potentially can become a valuable learning resource for others, as it is the case in Open Source Software (Meiszner, 2010: 2.4, 2.5, 3.6), in particular if such discourse relates to for example production activities or assignments (Meiszner, 2010: 3.2, 3.3, 3.4, 3.5). The studying layer can be highly dynamic and perhaps might be the least structured one.

3.4 Motivational layer

The motivation layer can either be of an extrinsic or of an intrinsic nature. Extrinsic motivations might relate to exams, assignments or other type of evaluations (Meiszner, 2010:

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3.3, 3.4, 6, 7.5, 9, 10, Dean & Leinonen, 2004; Ghosh et al., 2002; Ghosh & Glott, 2005b; Jensen & Scacchi, 2007; Sowe, 2007), with intrinsic ones relating to being interested in the subject, or enjoying participating at such an event for any other reason (Meiszner, 2010: 2.7, 5, 6, 9, 10, Fischer & Scharff, 1998; Scharff, 2002; Turner, et al., 2006). Extrinsic motivation therefore concerns rather formally enrolled students, with intrinsic motivations addressing as well formally enrolled students as free learners outside of formal education. Extrinsic and intrinsic motivational aspect might also be considered for practitioners and could be very different than the ones of learners, or might also be identical.

4.5.4   Assessment Layer

The assessment layer (Meiszner, 2010: 5, 6, 7.5, 9, 10) considers as well traditional and well-established assessment practices as those ones that can be commonly found within virtual and informal online learning ecosystems such as the Open Source Software one (Meiszner, 2010: 2.7.1). The assessment layer might draw on the assignment & practice layer, or also the teaching / lecturing or the social layer (Meiszner, 2010: 10.4.4.5).

4.5.5   Social Layer

The social layer refers to all aspects that are not directly aimed at studying the course subject. Components of the social layer might be 'off-topic' socializing components, or co-design aspects that relate to actively shaping and developing the Open Course ecosystem (Meiszner, 2010: 5, 9, 10).

4.5.6   Technological Layer

From the technical perspective the organizational layer might consider as well the internal course spaces and tools (Meiszner, 2010: 6.2, 6.3, 9.2, 9.3, 10) as the external ones (Meiszner, 2010: 6.4, 6.5, 9.2, 9.3, 10). It should put forward requirements and specifications on how to integrate and optimize the interplay amongst the former and the latter.

6. 1 Internal technological layer

This relates to all technical aspects with regards to the internal course environment used, tools, spaces, or also licensing aspects that could interfere (Meiszner, 2010: 6.2, 6.3, 9.2, 9.3, 10).

6. 2 External technological layer

This relates to all technical aspects with regards to the internal course environment used, tools, spaces, or also licensing aspects that could interfere (Meiszner, 2010: 6.4, 6.5, 9.2, 9.3, 10).

4.5.7   Economic Layer

From an economic perspective there are a number of layers that might be considered if looking at the field of Open Education at large. The initial chapter of this work have already discussed socio-economic aspects as well as thematic of sustainability

7.1 Financial economic layer

The financial economic layer, at the very basic, is concerned with aspects on how to finance Open Courses, potential additional cost involved in Open Course provision, sustainability aspects, or also associated revenue models.

4.5.8   Courses as Seeds / SER Layer

The Courses as Seeds / SER (Seeding, Evolutionary growth, Re-seeding) layer (Meiszner, 2010: 5.4, de Paula et al., 2001) is seen to be a Meta layer that concerns all of the layers above. Meta-design is aimed at a continuous improvement of processes and products (de Paula et al., 2001; Fischer 2007; Meiszner, 2010: 5). This starts with the initial seeding of the course, over its growth during the lectured period, up to the reseeding phase at which the created knowledge, structures and processes would be organized, formalized and generalized, before the circle starts again. Within an optimal hybrid organizational framework the SER process would be an integral and almost automated part (Meiszner, 2010: 10.6) so that by the end of for example a course semester a reseeding has been already taken place.

4.6   *A brief Organizational Guide to hybrid Open Course Design & Delivery*

This section provides a brief guide to hybrid Open Course design and delivery following the course layers as detailed at section 4.5. It shows the aim for each design or implementation action at the left column 'aim', followed by a brief 'description' and its 'nature'. The last column provides 'examples' from literature that provide further information to the respective aim.

Aim	Description	Nature	Examples
1. Content Layer			
Provide a modular structure and task focus, where the focus is less on content, but on activities.	Content is important, but content alone does not lead to interactions, collaborations or discourse. Make sure that activities, such as assignments or project works, are provided alongside the content.	Change / Implement	Meiszner, 2010: 2.9, 7.5, Brown & Duguid, 1991; Giuri et al., 2004; Mockus et al., 2002; Scacchi, 2002; Stürmer, 2005
1.1 Static resources internally provided			
Provide a clear course structure, with well-defined learning outcomes and course description.	Draw on the well-established traditional educational principles and provide learner with a clear course structure that details the various course components to be studied, the learning outcomes to be achieved, assignments and practice works, or timeframe.	Keep	Meiszner, 2010: 6, 7, 9, 10, Andres, 2002; Dean & Leinonen, 2004; Fischer, 2007
Provide a core course, including a set of learning resources that would allow studying the course	Keep the 'core' - the core course should provide all relevant materials and resources required to take the course. A greater range of content can enhance the course at a later point, but the core course might not be affected through this.	Keep	Meiszner, 2010: 2.3, 2.9, 6, 9, Tuomi, 2005

without further input.			
1.2 Static resources externally provided			
Make use and embed external learning resources.	Those ones might be leveraged into the course space by any of the stakeholders involved, and also consist of the artifacts created by participants.	Implement	Meiszner, 2010: 2.5, 3.6, 6, 9, 10, Glott et al., 2007; Weller & Meiszner, 2008
	Consider quality assurance mechanisms that involve the different stakeholders for example through rating and commenting systems.	Consider	Meiszner, 2010: 7.5, 10.2, 10.5
1.3 Dynamic resources			
Make use of artifacts produced by participants or discourse associated to it.	Artifacts and underlying discussions should be relatable to the static resources or assignments, so that they are embedded within a context.	Change / Implement	Meiszner, 2010: 2.2, 2.3, 2.5, 2.8,2.9, 3.4, 3.6, 6, 9, 10, Brown & Duguid, 1991; de Paula et al., 2001; Fischer, 1998; Glott et al., 2007; Hemetsberger & Reinhardt, 2006; Weller & Meiszner, 2008

	Explain to participants that the knowledge of the course should emerge as a result of the interaction between the different participant groups and their peers should be able to benefit from what has been done, the artifacts created or things experienced. Participants should be well aware about this to understand why they are supposed to make their works publicly available and to provide supportive information on those.	Change / Implement	Meiszner, 2010: 9.3, 10.2, Fischer, 1991; Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006
	Rating, commenting and tagging mechanisms might be implemented to facilitate re-use and to highlight good cases or resources considered to be of use.	Consider	Meiszner, 2010: 9.2, 9,3, 10.2
2. Teaching / Lecturing Layer			
Assure the availability of domain expertise.	Self-studying and peer-studying opportunities alone are not sufficient. There will always be the need for an instructor; even if in a differentiated role than traditionally provided. Therefore the course team should provide clear guidance and domain expertise.	Keep	Meiszner, 2010: 2.3, 3, 6, 7.5, 9, 10, Andreas, 2002; Dean & Leinonen, 2004; Fischer, 2007
	Use the available knowledge of the various stakeholders. Sub-level support perhaps could also be provided by practitioners or peers. A large group of course participants might possess a sufficient heterogeneous set of skills that would allow providing domain expertise too, therefore supporting the core course	Implement	Meiszner, 2010: 2.3, 2.6, 2.8, 6.4, 6.5, 9.2, 9.3, Fischer & Scharff, 1998; Hemetsberger & Reinhardt,

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	team.		2004; Hemetsberger, 2006; Scacchi, 2002; Stürmer, 2005
Establish mechanisms for rapid double feedback loops.	Be responsive to questions or problems and establish supportive spaces (for example forums) and mechanisms (for example commenting functions).	Change / Implement	Meiszner, 2010: 2.2, 2.3, 2.6, 7.5, 9.2, 9.3, Hemetsberger & Reinhardt, 2006
	Make sure that any type of support provided could be potentially re-used and remains available for others.	Change / Implement	Meiszner, 2010: 2.4, 2.5, 2.6, 2.8, 2.9, 5.3, 9.2, 9.3, 10, Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006
	Consider support provision to non-formally enrolled students, questions of them might also be of relevance to your own students, but your students just did not dare to ask.	Consider	Meiszner, 2010: 2.6, 9.2, 9.3, Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger, 2006; Scacchi, 2002; Stürmer,

			2005
2.1 Educator / Lecturer Layer			
Provide lectures and access to those that cover all the fundamental and theoretical information.	Make sure that lectures are open for all types of participants, as well in-class as online. If lectures are given in-class only then at the very least they should be made available for outside participants and presented in a manner that allow for self- or peer-studying.	Change	Meiszner, 2010: 6, 7, 8, 9, 10, Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger 2006; Scacchi, 2002
Provide clear guidance on participation for free learners not formally enrolled at a course.	Facilitate the entry of free learners and provide clear guidance on how they might participate. Make clear that free / open participation does has limitations regarding the time educators might be able to dedicate to free learners, but do avoid discriminating free learners.	Change	Meiszner, 2010: 6, 7, 8, 9, 10, Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger, 2006; Scacchi, 2002; Stürmer, 2005
2.2 Practitioner Layer			
Identify and engage with practitioners and provide	Participation of students and free learners within mature and well-established online ecosystems can be for the benefit of both: the practitioner side gains through the	Implement	Meiszner, 2010: 2.7, 5, 6.4, 6.5, 10.5, Ghosh et al.,

opportunities for their participation and support provision.	students / free learners contributions meanwhile the learner side acquires skills that might be difficult to obtain within traditional educational settings. Therefore it is important to make practitioners aware about this win / win situation and to seek agreements on strategic co-operation.	Implement	2002, Lakhani & von Hippel, 2003
	Make sure that tacit knowledge can become visible and observable through the common practice of and interactions among competent practitioners.	Implement	Meiszner, 2010: 2.4, 6.4, 6.5, 9.3, Brown & Duguid, 1991; Hemetsberger, 2006; Scacchi, 2002; Scharff 2002; Turner et al., 2006
2.3 Peer Layer			
Establish support mechanisms that would cater a potentially large number of participants.	Be aware that the course team alone likely could not provide support and therefore peers should be engaged into support provision.	Consider	Meiszner, 2010: 2.6, 9.3, Hemetsberger & Reinhardt, 2004; Lakhani & von Hippel, 2003; Swap et al., 2001
	Experts, leader, old foxes and knowledgeable community member play an important role for support provision, as well as task assignment. Therefore situations should be created within such Open Course approaches at which more	Change / Implement	Meiszner, 2010: 7.5, Lakhani & von Hippel, 2003; Swap et al., 2001

	knowledgeable members can commit to tasks.		
Reward and foster information & knowledge brokering.	Information and knowledge brokering activities not only foster interaction, but also allow both sides to learn – as well the provider as the recipient will benefit from this. Information and knowledge brokering is also important to reduce the time educators will need to invest to provide support themselves and therefore might be a mean to allow coping with potentially very large numbers of participants.	Change / Implement	Meiszner, 2010: 2.8, 9.2, 9.3, Felder & Brent, 2007; Lakhani and von Hippel, 2003; Swap et al., 2001
3. Learning Layer			
Establish mechanisms that make learning 'visible'.	Learning is by nature a silent process, but can be made visible, for example through discourse, debates or collaborations.	Implement	Meiszner, 2010: 2.4, 2.5, 3.6, 6, 9, 10.2, Glott et al., 2007; Hemetsberger & Reinhardt, 2004; Weller & Meiszner, 2008
3.1 Pedagogical Layer			
Design the course in a way that is suitable for self-studying.	The course must be suitable for self-studying, so free learners would be enabled to follow the course.	Change	Meiszner, 2010: 3.2, 9.2, 9.3, Fischer & Scharff, 1998; Ghosh & Glott, 2005b; Hemetsberger & Reinhardt,

			2006
Focus on project-based, problem-based, case-based, and inquiry-based learning activities.	Provide activities that enable participants to take on active roles, to become designer, contributor or collaborator. Let them work on ill-structured or ill-defined problems, debate ideas, plan and conduct their own experiments, etc. Modular design and task focus further facilitate this.	Change / Implement	Meiszner, 2010: 2.4, 3.4, 5, Duch, Groh & Allen, 2001; Jonassen, 1999, Krajcik et al., 1994; Savery, 2006
Allow for collaborative learning.	Provide activities that allow for collaborative construction process targeted at achieving an objective, for example solving problems or creating something.	Change / Implement	Meiszner, 2010: 3.2, 3.3, 5, 6, 9, 10, Glott et al., 2007; Mockus et al., 2002; Scharff, 2002; Stürmer, 2005; Valverde, 2006
Make sure that participants' assignments and projects are preserved in a way that allows for reflective practice (reflection on action).	Domain orientation and support of human problem-domain interaction is important, to establish a connection between people and the domain specific problems that they face, such as the assignments or projects they are working on. The availability of those assignments / projects, the surrounding discourse and the availability of the 'original designers' provides task-relevant information required for such a reflection.	Change / Implement	Meiszner, 2010: 3.2, 9.2, 9.3, Fischer & Scharff, 1998; Harel and Papert, 1991; Hemetsberger & Reinhardt, 2006

Provide space for social learning.	Allow for socialisation and informal learning that include opportunities and freedom to try things out, to adopt multiple roles, to make use of prior knowledge, or to take risks and make mistakes.	Change / Implement	Meiszner, 2010: 3.3, 3.4, 3.5, 5, 6, 9, 10, Brown & Adler, 2009; Gulati 2004
Provide participants with a real life experience through interactions in the real virtual world.	Let participants contribute to and engage at external well-established and mature online ecosystems and their communities. This allows participants to gain as well subject matter skills as key and soft skills; such as an increased level of tolerance and acceptance of other people's viewpoints.	Change / Implement	Meiszner, 2010: 2.4, 6, 9, 10, Andres, 2002; Duch, Groh & Allen, 2001; Felder & Brent, 2007; Gokhal, 1995
3.2 Assignment & Practice Layer			
Provide opportunities to work, individually or as a group, on concrete assignments or projects.	The work on assignments and projects should be organized in a way that the artifacts produced and underlying discourse is preserved as contextualized content "that makes sense to those that did not participate in its creation" (Fischer 1998).	Change / Implement	Meiszner, 2010: 2.3, 2.9, 5, 6, 9, 10, Brown & Duguid, 1991; Fischer, 1998; de Paula et al., 2001; Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006
Produce incremental deliverables with fixed deadlines.	All of the things that learners are expected to produce should have an adequate sized and must be easily to fulfil within the given time and participants should be able	Change / Implement	Meiszner, 2010: 6, 7.5, 9, 10.2, Scharff, 2002

| | to complete the projects with a certain degree of study and scaffolding from the educational material. Every project should also have a strict deadline.

Establish a 'release early' culture and provide rewards for early releases and frequent updates.

Explain participants at the beginning that they will be expected to showcase and present the things they produce and to make all outcomes available. | | |
|---|---|---|---|
| Require participants to make the outcomes of their work available in a clearly structured form. | Enable others to see and understand what peers are doing, to re-use and to build on it by requiring participants to make the outcomes of their work available in a clearly structured form. Establish structures that allow identifying how participants in related circumstances have learnt, the resources they used, or solutions they brought forward. | Change / Implement | Meiszner, 2010: 6.2, 6.3, 6.4, 9.2, 9.3, Fischer and Scharff, 1998; Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006 |
| | Concrete outputs such as assignments or project reports, as well as modularity or directory / SVN structures could allow for preserving such outcomes in a structured manner and to keep surrounding discourse within a context. Therefore structures should be established that allow for such outcomes to be systematically available. | Consider | Meiszner, 2010: 2.4, 2.5, 2.9, 10.2, Brown & Duguid, 1991; Mockus et al., 2002; Scacchi, 2002; Stürmer, 2005 |

Encourage participants to build on or extend the outcomes produced by earlier cohorts of participants.	In the case participants would build on the outcomes of other learner, they should clearly demonstrate their own achievements and what they have done.	Consider	Meiszner, 2010: 2.4, 2.5, 3.6, 5, 10.5.5, Brown & Duguid, 1991; Fischer, 1998; de Paula et al., 2001; Hemetsberger, 2006; Hemetsberger & Reinhardt, 2006
Provide examples and guides.	Clearly show what participants are expected to do and how the outcomes might look like.	Change / Implement	Meiszner, 2010: 2.5, 6, 9, 10, Hemetsberger & Reinhardt, 2006; Scacchi, 2002; Stürmer, 2005
Allow for some 'freedom of choice' so that participants would be able to engage to a certain degree in personal meaningful activities.	To allow participants to engage in personal meaningful activities a range of opportunities from which they could select should be provided, but make clear that participants are expected to commit to a given project and carry the responsibility for it.	Change / Implement	Meiszner, 2010: 2.7, 5, 6, 9, 10, Brown & Adler, 2009; Ghosh et al., 2002; Hemetsberger & Reinhardt, 2006
3.3 Studying (silent) Layer			

Promote discourse and debates.	Make tacit knowledge explicit and therefore visible and stimulate collaborative works on assignments and projects to foster discourse and debates around those.	Change / Implement	Meiszner, 2010: 2.4, 2.6, 2.8, 5, 9.2, 9.3, 10.2, Brown & Duguid, 1991; de Paula et al., 2001; Hemetsberger, 2006; Norman, 1993
Organize online 'meet-ups' for reflection on lectures or practice works.	Such meet-ups might be of a more informal nature to allow participants to express themselves within an environment that is not marked by a formal assessment culture, but by interest and curiosity.	Change / Implement	Meiszner, 2010: 2.2, 2.5, 3.3, 6.2, 9.2, 9.3, 10.2, Dean & Leinonen, 2004; Scacchi, 2002
3.4 Motivational Layer			
Promote a culture of learning and avoid a culture driven by accreditation and assessment.	Encourage tinkering, exploring, trial and error, and inquiry. Establish a 'release early culture' to enable participants seeing what their peers are doing and to provide a base around which dialogue could emerge. Assessment is an important element for formally enrolled students, but it might conflict with a culture of learning and therefore should not be on the forefront.	Change / Implement	Meiszner, 2010: 3, 5, 6, 7.5, 9, 10, Brown & Adler, 2009; Gulati 2004
Extrinsic (formally enrolled students)			

Use students evaluation as a means of motivation and make contributions mandatory!!!	Ex-ante 'evaluation' is a strong motivational factor for formally enrolled students to participate and become active, meanwhile ex-post 'the learning experience and outcome' seems to be of a high value. For this reason a right balance must be established between voluntary and mandatory participation. For formally enrolled students the submission of concrete outcomes, such as work on assignments and projects, should be an element of their overall evaluation, with clearly outlined and defined dates on what they are expected to 'deliver'.	Change	Meiszner, 2010: 3.3, 3.4, 6, 9, 10, Dean & Leinonen, 2004
Provide incentives for a 'higher than required' participation and value overachievement.	Consider incentives such as MVC (Most Valuable Contributor), which also would confront in a second level the problem of the lurkers. Honour active participation and allow participants to build up an online repute; 'star point system' or similar means could be used for this.	Change / Implement	Meiszner, 2010: 6, 7.5, 9, 10, Ghosh et al., 2002; Jensen and Scacchi, 2007; Sowe, 2007
Intrinsic (all types of learner)			
Allow for engagement in personal meaningful tasks.	Provide participants with a range of opportunities to engage at. On the subject matter level this might be the opportunity to select from a range of assignments or projects. From the course perspective participants must be enabled to actively 'shape' the course space, to take on ownership and to contribute to it.	Change / Implement	Meiszner, 2010: 2.7, 5, 6, 9, 10,Fischer and Scharff, 199; Scharff, 2002; Turner et al., 2006

4 Assessment Layer			
Adapt assessment to the changed situation.	The artifacts created by participants and underlying discourse might be considered for students' evaluation. Within an Open Course environment 'learning processes' can become 'visible' and therefore students' evaluation might draw on how students have progressed throughout the course and what they have learnt (gradual evaluation) instead of evaluating them at one given moment only.	Consider	Meiszner, 2010: 6, 7.5, 9, 10
Consider new form of assessment.	A peer-assessment cycle might be initialized, where every group (or individual) reviews and comments on the work of the others, for example completed assignments or projects. Peer assessment might take place at given moments, for example the presentation of a completed assignment or project, or it might be alongside the course, such as feedback received for support provision or active design achievements.	Consider	Meiszner, 2010: 2.7.1, 5, 6, 7.5, 9, 10
5. Social Layer			
Provide space for socializing & interactions.	Make sure that the course environment includes some socialising spaces and provides for opportunities to get together.	Change / Implement	Meiszner, 2010: 2.7, 6, 9, 10, Crowston & Howison, 2005; Gosh et al., 2005; Valverde, 2006; Weiss & Moroiu, 2007

Encourage active co-design of the Open Course Ecosystem.	Provide adequate means that facilitate active involvement in the course design process. The use of 'roadmaps' and 'whish lists' would be reasonable approaches so participants clearly know on how and where to contribute.	Change / Implement	Meiszner, 2010: 5, 9.3, 10.2, Fischer, 2007; Scacchi, 2002
6. Technological Layer			
Design 'simple' and grow from there.	Start with a basic set of tools that are known to work out, and grow from there. More technologies or sophisticated systems can still be added upon the base of clearly identified user needs.	Change / Implement	Meiszner, 2010: 2.2, 5, 6, 9, 10, Hemetsberger & Reinhardt, 2004; Meiszner, 2007
Design for 'flexibility' & 'rapid adaption', use Open Source Softwaresolutions or freely available online tools, services or spaces, or make sure that for-paid proprietary solutions offer the same possibilities and do not come at additional cost.	Make sure that all technologies allow for quick modifications and rapid exchange through the course team or participants in accordance to identified needs.	Change / Implement	Meiszner, 2010: 6, 9, 10, Fischer, 2007; González-Barahona et al., 2005a, 2005b; Kahn, 2001; Meiszner, 2007
Design 'open'!!!	The course environment must by any mean be truly open: At a minimum 'open	Change / Implement	Meiszner, 2010: 2.5, 6, 9,

	to read' for core course elements, in general be 'open to write or contribute' and when appropriate also 'open to modify' the work of others.		10, Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger, 2006; Scacchi, 2002; Stürmer, 2005
Understand the difference between 'core' and 'non-core' course elements and design in accordance.	To avoid that participants get lost and to keep control of the 'core' a central course space should be provided that hosts the core course components, such as course outline, instructional materials, and an initial set of learning materials or assignments. Non-core elements might be either internally or externally located.	Change / Implement	Meiszner, 2010: 2.3, 2.9, 6, 7.5, 9, Tuomi, 2005
Identify the 'core'!!!	Make sure that only those technological solutions become a part of the core that are actually required and carefully consider implementing additional functionalities. The main purpose of the core is to provide the initial course materials, meanwhile the artifacts created by participants or leveraged into the course space by them, as well as associated discourse, might well be located outside of the core.	Change / Implement	Meiszner, 2010: 2.3, 2.4, 2.5, 2.9, 9.2, 9.3, Tuomi, 2005
Provide tools that capture discourse and provide means so that this discourse is	Forums, mailing lists or wikis could assist to establish a cooperative and interactive environment and to facilitate the knowledge exchange between participants.	Change / Implement	Meiszner, 2010: 2.4, 3.6, 5, 7.5, 9.2, 9.3, Brown & Duguid, 1991;

contextualized and relates to assignments or practice works.	Make use of outputs produced by the learners, such assignments of project reports, and use tools that integrate those outputs such as directories and SVN type systems, or establish similar conditions, so that discourse and learning resources could be referenced and linked to concrete works on assignments / project reports and therefore allows for contextualisation.		de Paula et al., 2001; Glott et al., 2007; Hemetsberger & Reinhardt, 2004; Scacchi, 2002; Weller & Meiszner, 2008
Be aware of the 'core course', but allow for 'best of breed' wherever possible.	Make use of a 'best of breed' in the case the wider Web provides better technological solutions, practices, or in the case of already established and mature communities for respective study fields. Map and integrate the methodologies and tools used on the base of well-established practice, instead of trying to set up a 'parallel universe'. Be aware of associated risks such as giving up control and accepting a higher level of uncertainty. Make sure that the 'core course' remains functional within the inside space, even if the outer one would become unavailable.	Change / Implement	Meiszner, 2010: 2.3, 2.4, 2.5, 2.6, 2.9, 6, 9,10, Tuomi, 2005
Allow free learners to follow lectures.	Recorded lectures, online follow up sessions, or live lectures might be considered to allow free learners to participate. A separation between inside and outside course should be avoided as much as possible and therefore the course preferably should be openly available in its entirety.	Change / Implement	Meiszner, 2010: 2.4, 2.5, 3.6, 9.2, 9.3, Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger, 2006; Scacchi,

			2002

6. 1 Internal technological Layer

Provide a central course space as a 'core'.	The internal core course might draw on technical solutions already in place, the main requirement is that all course elements would be 'open to access'.	Change	Meiszner, 2010: 6, 7.5, 9, 10,Fischer and Scharff, 1998; Hemetsberger & Reinhardt, 2004; Hemetsberger, 2006; Scacchi, 2002

6. 2 External technological Layer

Enable participants to bring in their own spaces into the course.	Make use of a range of Web 2.0 tools and spaces, both pre-outlined and designed by the course team, as well as those ones brought in by the participants.	Implement	Meiszner, 2010: 2.2, 2.9, 3.6, 5, 6.2, 6.3, 9, 10, Fischer, 2007; Glott et al., 2007; González-Barahona et al., 2005a, 2005b; Hemetsberger, 2006; Iiyoshi and Vijay Kumar, 2008; Meiszner et

			al., 2008b, Scacchi, 2002; Scharff, 2002; Weller et al., 2008
	In the simplest form tags could be used so that external courses spaces can potentially be found and would be associated to the course.	Consider	Meiszner, 2010: 9.2, 9.3, 10.2
	A more integrated approach would be to link to those spaces through the outputs produced by the learners and therefore being clearly visible to others and accessible in a fairly structured way.	Consider	Meiszner, 2010: 2.2, 2.9, 10.2
	Automated processes might also be established so that external spaces would become visible within the internal course environment.	Consider	Meiszner, 2010: 2.2, 2.9, 10.2
Be aware of ownership.	In particular with regards to external spaces brought into the course by participants. The use of personal blogs for example might be problematic since the ownership of this blog is with the respective participant and therefore the possible re-use within further course editions unclear.	Consider	Meiszner, 2010: 6.4, 6.5, 9.2, 9.3
7. Economic Layer			
7.1 Financial economic Layer			
Availability of external funding is not a pre-	Open Courses can be designed and delivered even without external funding, though perhaps at a smaller scale.	Consider	Meiszner, 2010: 6, 9, 10

requirement.			
Be aware of the difference between 'additional cost' and 'value for money'.	Design and delivery of hybrid Open Courses might come at an additional cost, but is also could provide a higher value for students formally enrolled, such as acquiring an enhanced set of skills, a more up to date and close to market needs course, or to meet potential employers and to collaborate with them.	Consider	Meiszner, 2010: 6, 9, 10
Be aware of potential new revenue models that could come along with hybrid Open Course provision.	Consider the 'Next generation university' idea: exam-only + external bodies for learning, or: 'learning for free and extra services such as in-class sessions, virtual private tutoring or assessment and certification against fees'.	Consider	Meiszner, 2010: 7.5, 9.3, 10.5.5
8. Courses as Seeds / SER Layer			
Seeding			
Seed the course and allow it to be also shaped by the outside world.	All course elements that do not interfere with the core might be kept open to allow the wider world to shape and actively develop the course. Act upon the maxim 'the more the better', but prevent and discourage a culture of consumption; and accept that lurkers are likely the largest course group ;-)	Change / Implement	Meiszner, 2010: 6, 8, 9, 10, Scacchi, 2002; Scharff, 2002; Turner et al., 2006; Weller & Meiszner, 2008
	Encourage participants to self-organize their activities and within their own spaces of choice, to act as domain experts, or to become teachers to others.	Change / Implement	Meiszner, 2010: 3.3, 3.4, 5, 6.4, 6.5, 9.2, 9.3, 10, Fischer, 1998;

			Fischer and Scharff, 1998
	Enable participation of free learners outside of formal education by allowing them to follow the entirety of the course, including instructional and core learning materials, or assignments.	Change / Implement	Meiszner, 2010: 9.2, 9.3, Scacchi, 2002; Scharff, 2002; Turner et al., 2006
	Provide modular course structures to allow engagement at a modular course level, yet still providing a required level of structure and clear entrance and exit points.	Change	Meiszner, 2010: 2.2, 2.9, 9.2, 9.3, 10.2, Brown & Duguid, 1991; Giuri et al., 2004; Mockus et al., 2002; Scacchi, 2002; Stürmer, 2005
Provide 'easy entrance points' and win / win situations for practitioners to participate.	Consider establishing a market place for project opportunities provided to learners, with this learners and practitioners could find each other.	Change / Implement	Meiszner, 2010: 10.4.4, 10.5.5, Lakhani & von Hippel, 2003
Evolutionary Growth			
Allow for changes throughout the course duration if required.	Be adaptive to identified participants' needs and also consider adapting the course accordingly during its use time.	Change / Implement	Meiszner, 2010: 5, 9.2, 10, Fischer, 1998; Fischer & Scharff, 1998

Keep the course 'open' during its run-time.	Allow for add-hoc participation, or jump on / jump off participation, but make clear that the course team would not provide support that results from such a late entry.	Change / Implement	Meiszner, 2010: 9.2, 9.3, Lakhani & von Hippel, 2003
Re-seeding			
Establish continuity beyond semester terms.	Hybrid Open Course scenarios might attract a large number of participants with a heterogeneous set of skills. To assure continuity and community growth requires keeping participants within the course environment beyond semester terms. Therefore it might be considered to involve senior students that participated at the course at an earlier stage and encourage them to take on mentoring roles, or consider establishing cooperation agreements with practitioners from outside communities that would remain available for a number of course editions.	Change / Implement	Meiszner, 2010: 9.2, 9.3, 10.5,Brown & Duguid, 1991; Bacon & Dillon, 2006; Schmidt, 2007; Schmidt & Surman, 2007; Staring, 2005

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5   Concluding Notes & Outlook

This book provided an introduction to the 'Why and How of Open Education'; and the book should be understood as exactly that: an introduction. The Open Education field is still in its infancies and until today Open Education has been mostly addressed through one of its components parts: Open Educational Resources. There are still many lessons to be learnt, and perhaps one of the most important lessons that had been learnt from the research and pilot works that this book draws on, is that Open Education must be seen as a complimentary or integral part of traditional formal education, but not as an alternative mean. Much of the current efforts within the Open Educational Resource domain, for example, fall exactly short in this regard. But one should avoid looking only at random component parts, as well in education as in any other domain. Open Educational Resources, Open Source Software, Open Access, e-learning, m-learning, b-learning, Web 2.0, Web 3.0, Web 3.08.15, social learning, computer supported collaborative learning, peer-learning, etc. – all of those terms tangle component parts of the Open Education domain; at least all of the original ideas behind those terms tangle component parts of the Open Education domain, but certainly not the buzz created by those terms that rendered some of them pointless over time. And indeed, it is feared that the term 'Open Education' itself might be rendered pointless all to soon, even before this Open Education field has left its infancies. 'Open' has become one of the current buzz words and there is a tendency for 'Open Everything' – be it open or closed.

Now, how to proceed from here despite this 'Open Everything' threat? As has been highlighted within the first chapter, Open Education could allow for a higher level of digital inclusion and for the provision of innovative Open Education Services of high socio-economic impact in economies. When appropriately approached it could significantly affect economic growth and provide poverty alleviation. Many countries, in the developed and particular developing world, and their citizens, would gain from improved access to education and the development and localization of Open Education Services that truly fits their needs. Open Education Services that meet actual local needs could therefore have also a high impact in the poorest and most remote areas, regions affected by the "Digital Divide". Such regions could perhaps even emerge as leaders in the next phase of the global educational service economy – i.e. 'educational offers with a soul' that address societal needs. Especially in developing countries, or poorer regions, the number of Open Education producer communities and the variety of Open Education Service solutions and providers is likely to increase exponentially through Open Education approaches.

What is required at this point of time, however, is a reinforced focus on research and development in Open Education and Open Education Services, and to put both at the top of the political agendas. Research and development in Open Education and in Open Education Services must produce convincing evidence to show how both can have an impact on the development of national economies and society as a whole, therefore building policy support for Open Education and fostering its public adoption. Such evidence would further pave the way for new business opportunities within this Open Education domain, which does not exist on a large scale at the moment (and at best constitutes a niche market), but with great potential to be tapped and expanded. Research and development in Open Education and Open Education Services should further analyse and test the application of relevant Open Education tools and models that will demonstrate the socio-economic impacts and aspects, such as affordability, deployment and local exploitation opportunities. It should therefore facilitate the transformation of research results into local innovation, and foster the networking of relevant industry players with academia, incubators, SMEs, representatives from civil society, as well as local authorities. This would foster the creation of a new market within the Open Education Service domain, at which industry and academia could play a key role, and that potentially could result in long lasting self-sustainable partnerships and collaborative initiatives. It would further support policy makers by providing an outline of potential socio-economic impacts and aspects.

What are the chances for this to happen? Though innovation in education is perhaps happening at a slower pace then in other domains, it is happening, and thus chances are not too bad…

Annex

About the FLOSSCom Project

The initial FLOSSCom project[3] (2006 to 2008) had the following objectives:

- Identify the factors that contribute to successful knowledge construction in informal learning communities, such as Open Source Software communities;

- Analyze the effectiveness of such learning communities in a formal educational setting;

- Provide case studies, scenarios and guidelines for teachers and decision-makers on how to successfully embed such learning communities within formal educational environments to enhance student progression, retention and achievement.

About the OpenSE Project

The openSE project[4] (2009 – 2011) brings together Higher Education institutions, Open Source Software projects and enterprises from different countries, from Europe and beyond, to collaboratively build up a common learning ecosystem. The project's objectives are:

- Set up an Open Educational Framework for Software Engineering bringing together academia, formally enrolled students, fellow students, free learners outside of formal education and Open Source Software practitioners and enterprises;

- Systematically combine formal and informal learning within an unfettered informal learning environment;

- Stimulate participatory learning experiences and foster practical 'hands-on' sessions where learning activities and output become a learning resource itself; and

- Enable current and future learners to benefit continuously and fully from others' achievements, regardless where these achievements have been made.

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[3] Website: http://openedworld.net

[4] Website: www.opense.net

About the openED Project

The openED project[5] (2009 – 2012) aims to apply principles of mature virtual online communities, such as the Open Source Software communities, at a course level with the objectives to evaluate the applicability of such approaches, evolution of content and communities, speed of innovation, quality of learning provision and learning outcomes, and possible revenue models to support such type of free/open learning provision within cross-cultural and multilingual settings. The project therefore is developing and testing experimental approaches for participatory learning within open educational environments by means of 3 consecutive pilots to promote continuity, community building and evolutionary growth. The project further aims to develop and test revenue models – in accordance with pilots' results – to assure financial self-sustainability of Open Education.

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[5] Website: www.open-ed.eu

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