

Knowledge Dissemination in Sub-Saharan Africa: What Role for Open Educational Resources (OER)?

*Master's Thesis International Relations
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Mobile phone shop in the Kenyan village Naivasha

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Foreword

The idea for this thesis was born while doing an internship for the Carter Center's Conflict Resolution Program in the spring of 2006. Before I started my assignment for this organisation, I had no clue about what kind of work I would be doing for them, except that it would have something to do with conflict. The Carter Center's staff decided that my focus would be on Africa and particularly the countries Liberia, Ivory Coast, Guinea and Sierra Leone in West Africa. It was then that I realized how little I knew of this 'forgotten' continent, and I felt ashamed. My knowledge of Africa did not extend beyond images of conflict ridden countries with people struck by poverty, famine and terrible disease. After a while, though, I became aware that most of the people I knew, including other interns, most of the times even knew less about Africa than I did. I started to wonder: What are the reasons behind this? When I searched for information coming from Africa, it was often hard to find, especially when it was coming from remote places. For four months, the only few news items coming from Guinea I found, were about soccer matches. On the other hand, I found plenty of reports about Africa written by Western NGOs and international organizations. Being part of the Carter Center's team, I also had to prepare some.

There is a wealth of information about Africa available in the West, to which many Africans don't have access to nor are able to contribute to. The grim reality is that only one percent of the world's knowledge which is available comes from Africa. In addition, only a few Africans have access to this world's knowledge. And when they are in the unlikely privileged position to have access to internet, many often lack the resources to pay for the large share of knowledge which is locked up behind passwords within proprietary systems. How can this problem be solved, I asked myself, and especially beyond the technical issue of internet connectivity? While working on a report on Liberia, my father informed me about Opener, a project at Open Universiteit Nederland. Thus I became familiar with the concept of Open Educational Resources or "digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research"¹. Opener provides online courses for free in the areas of business, informatics, environmental sciences, physics, psychology cultural sciences and law. I started wondering: could such an approach also work in Africa?

¹ http://www.unesco.org/iiep/eng/focus/opensrc/opensrc_1.htm

There is no doubt that one of the solutions to Africa's lack of participation in the global information society is to improve access to quality education and educational materials, so on first sight OER offer great potentials for Africa. However, the more I found out about OER, the more it struck me, that if nothing is done, OER might actually widen the knowledge gap between Africa and the North. The OER movement is mainly led by the West. Developing OER can be capital intensive and thus most OER-projects originate from wealthy countries. There is a danger that Africans are consigned to the role of consumers of knowledge instead of producers. Nonetheless, OER also offers great opportunities for the development of Sub Saharan Africa, and Africans in tandem with development institutions and donors should grasp these opportunities. However, little is known about under what conditions OER might work in Africa or if the concept can be viable at all in. Therefore, this modest research project aims to achieve two goals: 1) to provide avenues for further research regarding how OER might enhance knowledge dissemination in Africa and 2) to inspire Africans and possible relevant stakeholders to create policies and set up OER projects aimed at the creation and dissemination of knowledge by Africans. This thesis builds on a paper written by me on the same topic for the Master's course "Abandoning Development: Africa and the Contemporary International Political-Economic System", taught by Dr. Kwame Nimako at the International School for Humanities and Social Sciences, University of Amsterdam.

This research wouldn't have been possible without the help and contributions of a lot of people. Therefore, I would like to thank first of all my parents, family and close ones for their support. Many thanks also to Prof. Gerd Junne, my thesis supervisor who borrowed me many books, always responded quickly to my questions and Prof. Cees Hamelink, for finding the time and enthusiasm to be my second reader. I also would like to express my gratitude to all the experts and people I consulted and who commented on my ideas, in particular Prof. Susan d'Antoni, Peter Bateman, Frank van Cappelle, Dr. Cathy Casserly, Sebastian Hoffman, Prof. Sally Johnstone, Prof. Derek Keats, Ronald Kim, Kerryn Krige, Dr. Wayne Mackintosh, Stephen Marquard, Alex Mulaku, Dr. Solomon Negash, Geoffrey Omedo, Dr. Ndege Speranza, Guilaine Thébault, John Traxler, Kim Tucker, Mary E. Uzoh, Prof. David Vincent and Dr. Clayton R. Wright.

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Abstract

This thesis examines how and under what conditions Open Educational Resources (OER) can improve the dissemination of knowledge in Sub Saharan Africa. According to UNESCO's definition, OER are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research educational materials². The OER movement has mainly been led from the West, by large institutions such as the Massachusetts Institute of Technology or the William and Flora Hewlett Foundation. Thus, there is a danger that Africans will be consigned to the role of consumers of OER instead of producers. Nonetheless, OER offer great potentials for Africa if implemented appropriately.

There is little literature on OER dealing specifically with Sub Sahara Africa, and the handful of articles that have been published on this topic take a narrow educational approach and avoid wider socio-economic and socio-political questions. Hence, this research examines not only how OER can be used as a cost-effective tool to improve the quality of education, but also how it might alleviate or worsen problems inhibiting knowledge dissemination such as information imperialism, brain drain, lack of access to education and knowledge to disadvantaged groups, intolerance to independent debate and civil conflict. In order to find some preliminary answers to these questions, additional data were gathered by conducting over twenty interviews with experts on OER in general or on ICT, education and development in Sub Saharan Africa.

The bottom line is that OER can help in dealing with some of the problems inhibiting the effective dissemination of knowledge in Sub Saharan Africa. However, only creating the necessary technological infrastructure in order to deliver OER will not be enough. The concept of OER can only work if Africans become more involved in the creation and adaptation OER according to their specific needs. Institutional, nation African wide and international policy frameworks should be put in place to enable this to happen. In order to establish such a policy-framework, African champions are needed on all levels to engage in awareness raising and capacity building around the concept of OER and to start up pilot projects. Moreover, OER networks should be developed which can not only affect change on the policy level, but also on the lives of African people.

² http://www.unesco.org/iiep/eng/focus/opensrc/opensrc_1.htm

*Knowledge is a treasure,
which can only be safeguarded
by giving it away*

Introduction

As the 21st century unfolds, new challenges and opportunities are arising due to changes in the global environment. Among the most significant changes are the growing importance of knowledge as a catalyst of economic growth within the global economy, the revolution of information and communication technology (ICT), the integration of the global labour market and worldwide socio-political transformations. These developments have made access to and production of knowledge an essential prerequisite for participation in the global economy. New information and communication technologies have significantly increased the speed of production, use and distribution of knowledge, thus making a country's economic and social wellbeing dependant on how quickly it can adjust its capacity to share and generate knowledge (Salmi and others, 2002: 14). These transformations offer many potential opportunities for both developed and developing nations. However, on the negative side, they also pose serious threats, and especially for developing nations. There is ample evidence that processes of globalization and the ascent of Manuel Castell's 'Information Society' have given rise to new problems, such as the growing knowledge gap and digital divide between the information rich and the information poor (Ahmed and Nwagwu, 2006: 87) among and within nations. Moreover, the globalisation of the labour market has led to the widely discussed problem of brain drain and the loss of advanced human capital, especially for the most vulnerable nations. In addition, these global transformations have led to a further marginalization of people who lack the skills and knowledge valuable for the global economy, leading to new forms of domination and suppression.

Unfortunately, these problems are only intensifying and especially in Africa. The World Bank predicts in its Global Economic Prospects-report of 2007 for instance that in the coming decades the benefits of globalization are likely to be uneven across regions and countries, and that Africa is the region most likely to fall further behind, because of underlying growth trends and the presence of many fragile states (Newfarmer and others, 2007: 16). On the other hand, this report also notices that Africa can gain the most from global integration, as it can benefit from technology and wage gaps to induce higher sustained growth. However, this will only be possible if African nations and the global community at large invest heavily in enabling Africa to participate in the global production and sharing of knowledge. Many initiatives have been

launched in an effort to turn the tide. The UN initiated for instance its ‘Digital Solidarity Fund’ in 2005 with the purpose of “transforming the digital divide into digital opportunities to promote peace, sustainable development, democracy, transparency and good governance” in developing countries³. In addition, many donor organizations, but also multinational companies have funded projects with a similar goal, although most of these projects are more geared towards building an appropriate ICT-infrastructure than towards the production and dissemination of knowledge itself.

Nevertheless, some rudimentary steps towards using ICT for knowledge production and dissemination in Africa have been undertaken, especially in the context of improving education. For instance, in May 2006 the first International Conference on ICT for Development, Education and Training was held in Addis Ababa, Ethiopia, endorsed by the Ethiopian government and the United Nations Economic Council of Africa (UNECA). The Ethiopian Minister of Education, Dr. S. Woldemichael, proclaimed during this conference that “Africa is on the move, and ICT-supported education is a core component of the development plans of most African governments. ICTs are being integrated into many national educational systems in order to reach the millennium goal ‘education for all’ ” (Hoffmann & Reif Consultancy, 2006: 4) In a comparable positive vein, Hamel argues in paper by UNECA, that online or e-knowledge, made possible by ICT, is the best thing ever to happen to African nations (Hamel, 2005: 217-229). Also on the global level, many share Hamel’s optimism about the opportunities of e-knowledge made possible by ICT and in particular the mainly western led movement advocating Open Educational Resources (OER). OER were defined in 2002 by UNESCO as “digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research⁴”. The key idea of OER advocates, as summarized by its main donor, The Hewlett Foundation, is “that the world’s knowledge is a public good and that technology in general and the World Wide Web in particular provide an extraordinary opportunity for everyone to share, use and reuse it.” (Smith & Casserly, 2006: 2).

³ retrieved from <http://www.dsf-fsn.org/en/05-en.htm>

⁴ retrieved from http://www.unesco.org/iiep/eng/focus/opensrc/opensrc_1.htm

This mainly Western led movement shares Hamel's optimism about the possibilities of e-knowledge made possible by ICT. In 'The Promise of Open Educational Resources', the Hewlett Foundation explains: "OER materials provide users with the intellectual capital to help understand and use the entire Web's content. In this regard OER connects "education for all", the UN's millennium goal that calls for everyone in the world to have a basic education by 2014, with the goal of closing the digital divide."⁵ Similarly, in a keynote speech at Open Universiteit Nederland on September 21, 2006, Dr. Jan Figel, European Commissioner for Education, Culture, Training and Multi-Lingualism, argued that "OER (added by author) can empower learners, promote equity and social inclusion, and fight the digital divide." (Open Universiteit Nederland, 2006: 10). Moreover, in his 2000-2001 annual report, MIT's former President Charles Vest proclaimed about one of the first OER initiatives, MIT OpenCourseWare, that "We see it as opening a new door to the powerful, democratizing, and transforming power of education."⁶

There is indeed some reason for optimism: hundreds of scientific and professional journals, papers, documents, encyclopaedias, reports, presentations and lectures can now be freely accessed by more and more scientists (although still too little) in Sub Saharan African countries (Ahmed & Nwagu, 2006: 90) However, is OER, as a form of e-knowledge, really the best thing ever to happen to Africa? Or will OER only be opening a new door to the powerful, as in Manuel Castell's information Society (Castells, 2000b: 68-168), transforming the oppressed at its will? In short: Can or will OER be used to increase knowledge dissemination in Africa? This is the central question this thesis seeks to examine. In order to examine this question, the thesis is structured in the following way. The first chapter will be an exposition of the methodology used, set out the main questions this thesis seeks to preliminary answer and give a review of relevant literature for this thesis and OER in general. The second chapter will give an introduction to the OER movement. The third chapter will look at how OER could be used to improve the quality of education in Sub Saharan Africa. The fourth chapter will deal with how OER can improve socio-economic factors inhibiting the effective dissemination of knowledge in Africa, while the fifth chapter will focus on socio-political factors. The sixth chapter will examine some general issues of implementation which the OER movement encounters all over the world, but where possible applied to the African context. The seventh

⁵ Idem,

⁶ retrieved from: <http://web.mit.edu/president/communications/rpt00-01.html>

chapter will cover some African specific issues, important for the implementation of OER. The conclusion will provide a summary of the conclusions reached in the previous chapters and come with some policy recommendations of how Africans and the wider international community could help in using OER to deal with problems Africa is facing in the effective dissemination of knowledge.

Chapter One: Methodology and main questions

1.1 A holistic approach

In order to find answers to the question of how OER will or can be used to increase knowledge dissemination in Africa, it is important to first identify problems which inhibit an effective dissemination of knowledge in Africa, before moving on to examine what role OER can or cannot play in dealing with these problems. This is not an easy task, and due to its complexity many factors can be considered as obstacles to an effective dissemination of knowledge in Africa. In addition, many factors are intertwined with other or similar factors in many ways. Development experts, working in the current ‘infrastructure paradigm’ of development, blame the bad state of the ICT - and other infrastructures in most African countries. Educators, blame the bad state of education itself in Africa. How can there be an effective dissemination of knowledge in Africa when the majority of Africans lack access to quality education?

Alternatively, some economists point to the appalling state of most of African economies as the most important factor inhibiting innovation and African participation in the global information economy. On the other hand, political scientists and conflict resolution specialists point to the devastating effect authoritarian regimes and political instability has on knowledge dissemination in a great deal of African countries. In addition, cultural anthropologists and sociologists argue that cultural factors pose the main threat to fostering cultures of innovation and knowledge sharing.

With this plethora factors inhibiting effective knowledge dissemination in Africa, coming from so many different disciplines and perspectives, it becomes hard, or lets say even impossible, to assess which factor is the most important. Nonetheless, it is of course evident that without a proper ICT-infrastructure the mainly ICT-based OER-movement won’t be able to live up to its potential in Africa. However, in literature this point is sufficiently stressed and many people and organizations and ICT-experts are working on this problem. Less is known, though, about the social context in which these infrastructures operate. This can be seen as one of the pitfalls of many development policies: by focusing too much on building material objects without understanding the wider social environment in which these objects are used, the buzzword ‘ICT’ might become just another western technological ‘fix’ to African problems, without

producing the expected benefits for Africa. Therefore, this thesis will take a holistic approach and focus not so much on infrastructural problems, although sometimes these are unavoidable, but on the social context surrounding them in relation to OER.

1.2 Three categories of problems: educational, socio-economic and socio-political

After reviewing an extensive amount of literature (see paragraph 1.4) coming from multiple disciplines and angles, a couple of educational, socio-economic and socio-political factors inhibiting knowledge dissemination were selected. Especially problems related to tertiary and secondary educational institutions were chosen, as these are the target institutions of the OER-movement. These problems can be classified along three categories. The first category is the most obvious one, as it deals with practical problems African universities face in their attempts to offer quality education, such as a lack of access at universities to educational facilities and scientific information, lack of opportunities for African scholars to disseminate their academic work, overcrowded universities, lack of availability of qualified teachers and the irrelevance of education to African needs. The second category concerns socio-economic problems such as information imperialism, brain drain and the lack of access for disadvantaged groups to education and knowledge. The third category covers socio-political factors inhibiting knowledge dissemination in Sub Saharan Africa. Many African countries are currently experiencing conflict, political instability or have a democratic deficit. Unfortunately, this has a devastating effect on education and knowledge dissemination, as during conflict, knowledge is often used to serve the purpose of war mongering factions, while repressive regimes also constrain the free dissemination of knowledge. In addition, during conflict usually universities and schools become a prime military target. Therefore civil conflict and intolerance to independent debate are also obstacles to an effective dissemination of knowledge in Sub Saharan Africa.

It should be clear that the educational, socio-economic and socio-political realm are interrelated and intertwined. Just to give a few examples: the lack of opportunities for African scholars to disseminate their academic work (educational) can be related to the socio-economic process of

information imperialism, which in turn has its roots in the process of colonialism⁷ (*socio-political*). And the lack of access for disadvantaged groups to education and knowledge (*socio-economic*) can be a source or a consequence of conflict (*socio-political*), and such conflicts are in turn often reproduced or reinforced by the educational structure of a country (*educational*). One can even question whether the above described problems can be categorized at all, due to the intermingling and complex interrelationships between these different realms. Nevertheless, the above described categorization will be used as a guideline for this thesis. However, it should be kept in mind that these categories should be interpreted with some flexibility.

1.3 Main questions

Having identified the above described problems inhibiting the effective dissemination of knowledge in Sub-Saharan Africa, the next step was to find out if, and if so, how OER can be used to overcome these problems and under what conditions. Therefore, questions were formulated for each category of problems. A fourth category was added, with a couple of questions concerning the practical implementation of OER. Unfortunately, these questions are too many to be dealt with in great detail, seen the scope of this research. Each question could be in itself the subject of a thesis or Phd project. Nonetheless, the aim of this thesis is to explore possible ways in which OER could be applied and under what conditions. Therefore it is important to raise these questions and to find some preliminary answers in order to stimulate much needed further research.

1.3.1 Questions OER and education:

- a) Can OER improve access to scientific information and educational facilities?
- b) Can OER increase opportunities for African scholars to disseminate their academic work?
- c) Can OER alleviate the problem of overcrowded universities by using learner-centred models of OER?
- d) Can OER improve the availability of qualified teachers on high schools and universities?
- e) How can OER make African education more relevant to African needs?

⁷ Looking at the socio-political roots of information imperialism, one could even make a case to place information imperialism squarely in the socio-political realm

1.3.2 Questions OER and socio-economic factors

- f) Is there is a danger that OER reinforces the process of information imperialism? Can this process be reversed by focusing on the creation of African OER?
- g) Is there a danger that OER reinforces the process of brain drain? Can this process be reversed by focusing on the creation of African OER? What role can play African Diasporas play in this?
- h) Can OER improve access for disadvantaged groups to education and knowledge?

1.3.3 Questions OER and socio-political factors

- i) Can OER be used in Africa to improve democracy?
- j) Can OER be used to promote transparent governance?
- k) What effect will OER have on civil conflicts? Can OER be used for the creation of conflict sensitive educational structures?

1.3.4 Questions about the implementation of OER

- l) How should OER be implemented?
- m) How can OER projects be sustainable? What kind of business model should be sought?
- n) What mechanisms of quality assurance should be sought?
- o) Is there a lack of leadership among Africans?
- p) What pedagogical and cultural dispositions in Sub Saharan Africa should OER take into account in order make their application effective?

1.4 Literary review

1.4.1 Knowledge dissemination

There exists an overwhelming amount of literature on knowledge dissemination in general and in relation to economic problems of developing nations and Africa in particular. A complete review even the most important works that have been written in this field would be far beyond the scope of this thesis. Hence, only short overview will be given of some key works and recent reports on knowledge dissemination that were particularly useful for this thesis. There is of

course Manuel Castell's (2000) well known trilogy focusing on the 'information society'. His work provides some important insights this thesis draws upon: such as Castells' analysis of new modes of economic production creating a gap between the 'information rich' and the 'information poor' and his related analysis of the concept of Information Capitalism. Lor and Britz (2003), talk in their analysis of information flows from North to South about 'information imperialism', adding a neo-colonial discourse to Castell's oeuvre. Mkandawire and others (2005) provide a comprehensive narrative concerning knowledge dissemination in Africa and problems African intellectuals face.

There are many articles lamenting the bad state of African education, sometimes in relation to a lack of access to information and communication technology. Hoffman (1996), Limb (2005), Ahmed and Nwagu (2006) are just to name a few. In addition, the World Bank reports of Salmi and others (2002) Murphy (2002), Bollag (2004) deal with similar problems, though sometimes on a more positive note. There also exists a wide ranging body of literature about ICT-based knowledge dissemination in relation to governance, democracy and culture. In their study for the United Nations Economic Commission for Africa, focusing specifically on Africa, Bounemra Ben Soltane and others (2004) offer an in-depth analysis of how ICT can improve governance and democracy in Africa. And in an interesting case study Pianmo, M. (2002) explains for instance how e-democracy could turn citizens in Tanzania into active contributors to the political process.

There is also a growing literature on the relation between education, conflict and reconstruction in which knowledge dissemination also plays a role. Especially noteworthy is Saltarelli's (2000) seminal article on the 'two faces of education', which explains how education can not only be used to reduce conflict, but also can have the opposite effect. In addition, UNESCO's International Institute for Educational Planning has produced a couple reports and guidelines concerning the role of education in conflict and reconstruction, like for instance its guidebook for planning education in emergencies and reconstruction (UNESCO, 2000). However, the most comprehensive study in this field so far is Seitz' (2004) extensive study for the Deutsche Gesellschaft für Technische Zusammenarbeit concerning the role of role of education in development cooperation and the creation, prevention and resolution of societal crises.

1.4.2 Open Educational Resources⁸

As long as people have provided educational materials for free, open educational resources have existed. It was only since a meeting of UNESCO in Paris that these materials were coined as such. Some concepts were already developed, such as OpenCourseWare, learning objects, open source software and open licenses. Including a review of the literature on these would be beyond the scope of this thesis. A little clarification with respect to the Open Source movement is needed though: some people tend to confuse open educational resources with the open source movement. Although they are both underpinned by the ideology that intellectual products should be shared for free and although some OER use open source software, OER serve a different purpose: to enhance education and knowledge instead of creating a better software product for the benefit of all. Here only the literature that deals specifically with OER, so after the inception of its term in 2002, will be dealt with.

Early writings on OER include Johnstone and Poulin (2002) who give an early overview of what OER is, taking the Massachusetts Institute of Technology's (MIT) Opencourseware-project as an example. They explain some of MIT's background motives, how it has dealt with copyright issues and technological challenges for spreading OER worldwide. Moore (2002) points to the distinction between open source development tools and open source courseware (content). Moreover, she argues that not every higher education institution needs to sponsor an open source project. Siemens (2003) sums up a number of reasons why it is in the interest of educators to share learning resources for free, i.e.: it does not cost anything to share digital resources; it gives educators alternatives and increases competition on the market and it is democratic and a way to preserve public education. In 2004 a couple of articles and papers on repositories of OER appeared. Hart and Albrecht (2004) explore how online repositories and referatories (websites hosting links to resources, but not the resources themselves) have an impact on faculty, students, IT support and institutional policies and procedures.

An initiative which stimulated further research is the discussion forum organized in 2005 by UNESCO's International Institute of Educational Planning. Issued as a background note to this forum, Johnstone (2005) offers an overview of the OER movement at that point in time. In a

⁸ See also the literary review of the OECD report by Hylén & others. (2007) *Giving Knowledge for Free, The Emergence of Open Educational Resources, OECD Report*, Paris: Centre for Educational Research and Innovation (CERI)

second background note, four major OER initiatives are presented in further detail, together with lessons learned and future challenges. The projects covered are MIT OpenCourseWare (OCW) project, Rice University's Connexions, Carnegie Mellon University's Open Learning Initiative, and the Center for Open and Sustainable learning at Utah State University. The findings of this forum are summed up in the final forum report of Albright (2005). Of interest is also a paper by the Hewlett Foundation by Smith and Casserly (2006), which basically focuses on the successes of OER projects up to 2006 in which the Hewlett Foundation participated.

Additional sources of information on OER can be found in evaluation reports from individual projects, such as MIT's annual comprehensive evaluation reports on the MIT OCW website (Carson, 2004, 2005, 2006). Other sources include proceedings or presentations held conferences, such as the documents resulting from the Open Education Conference at Utah State University from 2005 and 2006 (Utah State University, 2005, 2006) or d'Antoni's account of the OER movement presented at the ICDE SCOP meeting in Lillehammer in 2006 (d'Antoni, 2006). There are also numerous websites which can be consulted (see appendix D). UNESCO's IIEP started for instance in 2006 a wiki on useful OER resources, which is continuously updated with the help of the public⁹. The most recent and most comprehensive reports on the OER movement are the report Atkins, Brown and Hammond (2007) wrote for William and Flora Hewlett Foundation, a report by Hylén and others (2007) commissioned by the OECD's Centre for Educational Planning and Innovation (CERI) and a report edited by Geser (2007), for the European Union funded Open eLearning Content Observatory Services (OLCOS).

1.4.3 Open Educational Resources and Sub Saharan Africa

None of the aforementioned works focus much on OER in relation to developing countries, although the latest reports from the OECD (Hylén and others, 2007) and the Hewlett Foundation (Atkins, Brown and Hammond, 2007) include some views regarding the application of OER for development purposes. Unfortunately, only a few writings deal specifically with the application of OER in Africa. Moon (2000) and Moon and Dladla (2002) argue that an open learning environment could become a new paradigm for teacher education in Sub-Saharan Africa and development of teacher education in general. Keats (2003) describes

⁹ see: <http://oerwiki.iiep-unesco.org>

a process model for collaborative development of content, building on lessons learned from open source software development. According to Keats, this model has great potential for African universities. Materu (2004) notes that open source courseware has generated interest in all parts of the world and especially in the United States, but that the role of developing nations is constrained by a lack of resources needed to develop and adapt courseware to suit their specific environments. Bateman (2007) argues in a working paper that there is a danger that African universities and other tertiary institutions may tend to participate as unequal participants in the OER movement. Therefore, taking the African Virtual University's Teacher Education in Sub-Saharan Africa (TESSA) OER-project as an example, Bateman argues that African Higher Education institutions should become involved in the adaptation and creation of OER, as they know best how local pedagogical, epistemological, ideological, cultural, social as well as technology related challenges should be dealt with.

1.5 Additional data gathering

As the literary review reveals, there is only little literature available on OER in relation to Sub Saharan Africa (hence the need for this thesis). Therefore, the only way of finding more information about its possible application in Africa was by interviewing experts on OER and ICT, education and development in general, both from the West and Africa. A perfect venue for meeting African experts on ICT in relation to development, education and training was the 2nd International Conference on ICT for Development, Education and Training, held at Nairobi, Kenya from May the 28th until May the 30th¹⁰. During this conference, several workshops were organized on how to apply OER in Africa. This conference not only made it possible for me to get the most up-to-date information on the state of OER in Africa, it also enabled me to conduct over twenty five interviews with experts in the field of ICT, development and education. Unfortunately, only a few of these were experts on OER and some interviews were to short due to time constraints to provide valuable information. Therefore, some of these interviews were followed up by an interview on the phone. In addition, I interviewed in the Netherlands some leading expert on OER who attended from the 3rd to the fifth of June the closed SCOP meeting on OER for Directors of distance teaching universities, organized by the

¹⁰ See www.elearning-Africa.com

International Council for Distance Education (ICDE) and hosted by the Open Universiteit Nederland, Heerlen¹¹.

All interviewees received a 42 page working paper on OER. This thesis can be seen as an extended and adapted version of this paper. Unfortunately, only a few provided valuable feedback on this paper, what is somewhat understandable due to its length. Nonetheless, when people provided feedback, their feedback was most of the times very useful. In addition, most interviewees received beforehand a questionnaire, which served as a guideline for structuring the interviews (see Appendix A). This questionnaire basically sets out the already described questions this thesis is concerned about. However, sometimes different questions were asked that were more in line with the expertise of the interviewed people. Therefore, the questionnaire was adapted several times. In total material of twenty-two interviews has been used in this thesis (see appendix B). Eleven experts are African residents or were born in Africa. The other eleven experts are from the West. Summaries were made of all interviews (which were recorded on an MP3 player). For each problem area, relevant information from these interviews was selected together with information gathered at the conference in Nairobi and some additional literature.

An analysis was made of how OER might or might not be used to overcome the before mentioned factors inhibiting the dissemination of knowledge in Africa based on this information and the already consulted literature. Different methods of analysis were used depending on the chapter. For chapter three, which investigates the possible uses of OER as a tool to improve the quality of education in Africa, this analysis was conducted by using the well known Strengths-Weaknesses-Opportunities and threats (SWOT)-method¹². This method works well when applied to tools, products or organizations with certain known inherent characteristics and a clear distinction between such inherent qualities and conditions of the outside world. However, the SWOT-method can be problematic when applied to processes where the demarcation between structure and agency is not clear or fluid, as is the case when both structure and agent constitute each other. This is so for most of the above mentioned

¹¹ See <http://www.ou.nl/eCache/DEF/80/127.html>

¹² The SWOT method is a tool used for strategic planning to evaluate the Strengths, Weaknesses, Opportunities, and Threats (SWOT) involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieving that objective. The technique is credited to Albert Humphrey who developed the SWOT analysis at Stanford University in the 1960s and 1970s. In chapter three and four of this thesis, SWOT-analyses will examine in relation to each identified problem area inhibiting knowledge dissemination the inherent strengths and weaknesses of OER and also the opportunities and threats posed by external conditions on OER. (A. Humphrey, 2004)

socio-economic and socio-political processes, as in most of these processes the social context becomes part of OER itself. Therefore, for chapter four and five a more simplified version of the SWOT analysis was applied. These analyses only focus on challenges and opportunities for OER to overcome socio-economic and socio-political barriers to effective dissemination of knowledge in Africa. Chapter six and seven which concerns challenges facing the implementation of OER itself, are structured more flexibly.

Chapter Two: What are open educational resources?

2.1 Open Educational Resources (OER), a global movement?

In 2002, MIT decided to put all its course material on-line for free, leading the way for a new movement. Subsequently, the term Open Educational Resources (OER) was coined by UNESCO in 2002 at a meeting in Paris on ‘The Impact of Open Courseware for Higher Education in Developing Countries (d’Antoni, 2006). According to this 2002 view OER is to refer to digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research. Moreover, the participants of this meeting expressed their “wish to develop together a universal education resource available for the whole of humanity, to be referred to henceforth as Open Educational Resources (D’Antoni, 2006). Since then, a couple of global OER-initiatives and study groups have been initiated, some in close collaboration with UNESCO and the OECD.

One of the first OER-networks has been developed under the leadership of the Massachusetts Institute for Technology (MIT) and the Hewlett Foundation¹³: The opencourseware consortium¹⁴. OpenCourseWare refers to free and open digital publication of high quality educational materials, organized as coursesoffers. The OCWconsortium-site offers an overview of links to over 50 ‘OpenCourseWare’ projects that have been launched in predominantly developed countries all over the world. Moreover, also projects involving UNESCO have been initiated: First of all, UNESCO’s International Institute for Educational Planning (IIEP)¹⁵ has created a forum with over 500 members from 90 countries discussing issues related to the promotion, development and use of OER and a wiki-like website to stimulate further discussions.¹⁶ According to D’Antoni, by July 2007 this community consisted for 16% of members from Sub-Saharan Africa. In addition, the International Council for Open and Distance Education (ICDE) has set up in close collaboration with UNESCO an ICDE OER Task Force¹⁷ with the mandate to develop a report on OER. Similarly, the European Association of Distance Teaching Universities (EADTU) has initiated a task force on Self-

¹³ www.hewlett.org

¹⁴ www.ocwconsortium.org

¹⁵ http://www.unesco.org/iiep/eng/focus/opensrc/opensrc_1.htm,

¹⁶ <http://oerwiki.iiep-unesco.org>

¹⁷ <http://www.icde.org/oslo/icde.nsf/id/E02715A264A73FCCC125727D005450E4?OpenDocument>

Learning through Open Resources promoting the development and delivery of OER and has launched a pan-European project called MORIL: Multilingual Open Resources for Independent Learning¹⁸ with the objective of developing learner centred models of OER. Moreover, the European Open eLearning Content Observatory Services Project (OLCOS) has been launched, funded by the European Union's eLearning Programme with the aim of promoting the concept, production and usage of OER in Europe¹⁹. In addition, the OECD's centre for Educational Research and Innovation (CERI) has started a project studying why the movement of OER is growing, who is involved in it and its most important implications.²⁰ In many of these and other OER initiatives, the American based Hewlett foundation has been a major donor and catalyst for starting up projects.

When analysing the above mentioned OER initiatives, it becomes evident that the OER movement is more an international than a global movement as the developing world is highly underrepresented in these initiatives. The OCW consortium has for instance not one member from a low-income country²¹, although they are affiliated with the World Bank's sponsored African Virtual University and actually have one South African members. Also the ICDE mainly consists of members from the developed world. Nevertheless, they have a strong connection with UNESCO, have initiated some projects in Africa and Latin America. MORIL is centred on Europe and so is OLCOS. The OECD's CERI project is of course run by OECD-countries.

2.2 Three existing models of OER

After reviewing the structure and nature of many OER initiatives, three existing types of OER can be identified: a content-centred, a learner-centred and a creation-centred model. However, as is always the case with classifications, the boundaries between these different types are not always clear and sometimes a certain OER initiative might consist of more than one type at the same time.

¹⁸ <http://www.eadtu.nl/proceedings/2006/Full%20papers%20parallel%20sessions/van%20Dorp;%20MORIL,%20A%20pan-European%20EADTU%20project%20on%20New%20Generation%20OER.pdf>

¹⁹ <http://www.olcos.org/english/about/>

²⁰ http://www.oecd.org/document/20/0,2340,en_2649_33723_35023444_1_1_1_1,00.html

²¹ http://en.wikipedia.org/wiki/List_of_countries_by_Human_Development_Index

2.2.1 Content centred models of OER

A good example of a content centred initiative is MIT's Open Courseware site. This site publishes in the public domain content derived from traditional courses given at MIT without much adaptation. It consists of syllabi, lecture notes, assignments, examinations, reading lists and samples of student's work. As such, OpenCourseWare is not equivalent to an MIT education, but intended to be a source of inspiration for teachers and self-learners around the globe (Open Universiteit Nederland, 2006: 12). A characteristic of this model is that the information-flow is one-directional, as there is no direct feedback of users built into the system. Other content-centred examples of OER are for instance libraries, encyclopaedias, scientific journals, research communities and so on, that bring their books and articles online for free

2.2.2 Learner Centred models of OER

Specifically aimed at the learning experience of its users, is the 'learner centred'-model of OER. Good examples of this are for instance OpenLearn of the UK Open University, OpenER of the Open Universiteit Nederland (OUNL) and MORIL (Multilingual Open Resources for Independent Learning) of the European Association of Distance Teaching Universities. These, by the OUNL proclaimed 'New Wave'- initiatives focus on the offering of high-quality learning materials in a distance learning context, primarily meant for independent self-study. The target audience consists primarily of life-long learners. (Open Universiteit Nederland, 2006: 21) The learning experience of learner-centred models could be enhanced by artificial and real teachers interacting online with students, thus creating a more multi-directional type of OER.

2.2.3 Creation-centred models of OER

The most multi-directional type of OER, and some would say most non-directional, is the creation-centred model. A good example of this is the Connexions project initiated by Rice University. The Connexions project not only provides a fast growing collection of free scholarly material, but also free software tools to help authors publish and collaborate; instructors build rapidly and share custom courses; and learners to explore links among

concepts, courses and disciplines. The key idea of the Connexions project is to build an infrastructure which enables teachers and learners to remix and compose new objects from old ones (Atkins, Brown & Hammond, 2007: 10-11). However, a problem of such a creation-centred model is, that it can lead to information overkill and problems of quality assurance. In response to this, connexions designed a way of evaluating material and to direct users to materials deemed of high quality by offering a filtering, recommending and reputation - system, characterised by so called ‘lenses’ provided by third parties²²:

Each lens has a different focus. As a simple example of a lens, imagine a professional society independent of connexions, such as the American Physical Society, that sets up a web page containing a list of all physics Connexions modules and courses it deems high quality. It can also post reviews of those modules and courses... Users will be able to configure their Roadmap browser to view preferentially those modules approved by the editorial bodies of their choice. Of course, users will always have the option of turning off all their ‘lenses’ to view the commons in its entirety.

If the learner centred initiatives of Open Universities targeted at life-long learners can be called new-wave OER initiatives, it would be appropriate to coin projects such as connexions ‘new-generation’ initiatives, as the new generation of students growing up learn differently from prior generations. They learn from and with their fellow students as much as from standard sources of authority by building, remixing, modifying, blogging, conversing, sharing hints stories and writings through digital communication in both physical and virtual worlds (Atkins, Brown & Hammond, 2007: 43-44). As such, the connexions-project fits neatly with this new way of learning. Other examples of creation-centred OER ‘new generation’-initiatives are Wikipedia and its daughter Wikiversity, a community for the creation and use of free learning materials and activities²³. The massively multiplayer game Second Life which enables users to create their own worlds and create and participate in virtual spaces such as classrooms, amphitheatres also has been and has the potential to be used as a creation centred model of OER, if only those Linden-dollars, which are needed in

²² The Connexions working paper is available from Richard Baraniuk (rich@rice.edu) See <http://www/cni.org/tfms/2001b.fall/handout/Connexions.RReedstrom2001Ftf.pdf>

²³ http://en.wikiversity.org/wiki/Wikiversity:Main_Page

this virtual world to pay for most of those creations, would be abandoned. Nevertheless, the Open University of the United Kingdom has already started a Open Educational Resources community in Second Life, but how relevant is this to Sub-Saharan Africa?

2.3 OER: State of affairs in Sub-Saharan Africa

As said, the OER-movement is still more an international movement led by developed nations than an inclusive global movement with a significant positive impact on developing nations, as originally envisioned by UNESCO and leading OER proponents. Also the Hewlett Foundation claims that one of their primary goals is to use information technology to help equalize access to knowledge and educational opportunities across the world, including developing nations (Atkins, Brown & Hammond, 2007: 31). Notwithstanding this goal, the Hewlett Foundation also admits that the impact of OER in developing countries is still ‘modest’ with respect to the need and potential (Atkins, Brown & Hammond, 2007: 32). This is not surprising when we look to the amount of money the Hewlett Foundation has invested in projects for developing nations: Of the \$ 68 million the Hewlett Foundation has spent so far on OER, only \$ 6 million went to projects connected to developing nations, including more developed nations such as China and Russia. ‘Modest’ is probably an understatement when considering the amount of funding for OER initiatives in Sub-Saharan Africa. Nevertheless, there have been some projects originated in the West with a specific focus on Sub-Saharan Africa. On the positive side though, it seems that the lists of OER-projects aimed at knowledge creation in Africa is steadily growing. Some of the projects worth mentioning here (for a more comprehensive overview, see appendix C) are the following:

- The Free/Libre and Open Source Software for Education in Africa (FLOSS4Edu) initiative has been set up with the aim of promoting the development of free content by Africans for Africa, by using wiki-based technologies
http://www.wikieducator.org/FLOSS4Edu#Educational_Content
- The Commonwealth’ of Learning Virtual University for Small States of the Commonwealth, in which also small African states, including Botswana, Lesotho, Mauritius, Namibia, Sierra Leone, Swaziland and the Gambia, participate in the creation of post-secondary, skills-related OER <http://wikieducator.org/VUSSC>

- The Open University (UK) and the African Virtual University (AVU) based in Nairobi initiated the Teachers Education in Sub Saharan Africa Program (TESSA). TESSA uses OER and focuses on core teaching skills at the primary level together with a consortium of 14 African universities and the Commonwealth of Learning and the BBC World Trust. TESSA also allows teachers to adapt and create customized OER
<http://www.tessaprogramme.org>

- In 2000, seven countries from the Southern African Development Community (SADC) initiated STAMP 2000+, and developed 1,800 pages of OER clustered in 18 modules to train and upgrade upper primary and junior secondary teachers and administrators in Southern Africa. The materials were localised for each participating country
<http://www.edsnet.na/Resources/STAMP2000.htm>

- The University of Western Cape, South Africa, launched in august 2006 its Free-Open Courseware policy and became the first African member of the OpenCourseWare consortium and actually the first university in the world to actively reward staff for the creation of OER
<http://freecourseware.uwc.ac.za>

Nonetheless, in general it is safe to say that the OER movement has not materialized yet in Africa, what is of course not surprising as still many obstacles will have to be overcome. To cite the review for the Hewlett foundation: “the challenge here is immense, but so is its potential impact” (Atkins, Brown & Hammond, 2007: 32). However, what are exactly these challenges and opportunities in the light of the aforementioned problems with respect to knowledge dissemination in Africa and Africa’s education system in general? As the OER movement is still in an embryonic stage and especially in Sub-Saharan Africa, there will be no clear cut answer to this question.

Chapter three: OER and educational factors inhibiting the effective dissemination of knowledge

3.1 Introduction

Many educationalists lament the appalling state of educational systems in Sub Saharan Africa and see this as a main inhibitor for an effective dissemination of knowledge. Often cited problems are a lack of access at universities to educational facilities and scientific information, and the related lack of opportunities for African scholars to disseminate their scientific work. In addition, overcrowded universities and a lack of availability of qualified teachers are also often seen as defining the African educational context. Moreover, some educationalists deplore that many African universities have lost touch with their surrounding communities and don't educate their students according to African needs. This chapter will focus on how OER is or might be used as an educational tool to deal with these problems and how its application might actually worsen some of them. In order to find more out about this, SWOT analyses will be conducted on OER in relation to each of the afore mentioned problems. A little warning, though, is here in place: the ideas and outcomes resulting from these analyses are not meant to be taken as a proof of something, but to offer some qualitative insights into the topic and to provide avenues for further research. Moreover, there is great variation among Sub Saharan African countries to what extend these problems apply. Nonetheless, many African educational institutions experience the same kind of difficulties.

3.2 Lack of access at universities to educational facilities and scientific information

3.2.1 The Problem

One of the challenges facing the dissemination of knowledge in Africa is the lack of access to educational facilities and scientific information. Most African universities can't provide their students with the appropriate laboratory materials, ICT-equipment or even with sufficient

furniture. Such facilities are taken for granted nowadays by any quality education as a prerequisite for accessing and contributing to the world wide knowledge base. Moreover, Academic libraries, if existent, are seriously under funded and badly managed (Hoffmann, 1996: 85). Add to this the for African universities often astronomical prices for access scientific information, caused by Intellectual Property regimes favouring the wealthy and it becomes clear that even if the appropriate infrastructure and equipment would be put in place, the problem of lack of access to educational facilities and scientific information would still not be solved. Thus, the first question this thesis seeks to preliminary answer is the following:

Can OER improve access to scientific information and educational facilities?
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3.2.2 Strengths of OER to improve access at universities to scientific knowledge and educational facilities

Content-centred OER offer great opportunities to improve access to scientific information by their potential to create freely accessible digital libraries. According to Thébault: “OER can achieve a cost effective improvement of access to scientific and technological information, or in other words: to knowledge which most of African universities cannot afford” In addition, interactive learner-centred and creation centred OER models can also be used to give students access to and participate in cyber-science activities in virtual laboratories, such as exemplified by the ‘science gateways’ as listed on the TeraGrid website²⁴ set up by the National Science Foundation of the United States. Another example of a virtual laboratory is the Open Science Grid²⁵, a globally distributed computing infrastructure for large-scale scientific research, built and operated by a consortium of universities, national laboratories, scientific collaborations, and software developers²⁶.

²⁴ www.teragrid.org/programs/sci_gateways/

²⁵ www.opensciencegrid.org/

²⁶ for a more detailed explanation of the newest developments in cyber science see Atkins, Brown & Hammond, (2007: 47-50)

3.2.3 Weaknesses of OER to improve access at universities to educational facilities and scientific information

It is hard to identify weaknesses inherent of OER with respect to increasing access to scientific knowledge, as this is one of the main purposes of the whole concept. How can freely sharing scientific knowledge possibly not improve access to this knowledge? Well, one obvious weakness is that OER can't by themselves provide universities with ICT equipment. Moreover, Virtual Laboratories can't just replace real laboratories, they can only complement them.

3.2.4 Opportunities of OER in relation to a lack of access at universities to educational facilities and scientific information

A great opportunity for using OER to improve access to educational facilities and scientific information comes from the lowering costs of ICT equipment and bandwidth, especially in relation to mobile technology. In addition, some African universities have shown it is possible to provide students at little cost with access to ICT and the internet by public-private partnerships and by playing a leading role in providing their countries with ICT services. The approach of the University of Dar Es Salaam (UDSM) can again serve as a source of inspiration (Bollag, 2004: 12):

UDSM decided to invest heavily in information technology. It has installed hundreds of computers and become one of the best-wired African universities outside of South Africa, with most campus buildings connected to the internet via high speed, fiber-optic, cables. The university has opened air-conditioned Internet cafes that are always full of students e-mailing or searching for scholarship information. To help subsidize development of its own computer infrastructure, UDSM established a wholly-owned private company, UCC (University Computing Center) Ltd. to market internet services, provide training, and develop and sell software in Swahili – a potentially significant market with some 80 million Swahili speakers in East Africa

OER can profit from such developments and approaches. Not all universities though will be able to implement a project which provides full internet connectivity. Short of that, there have been implemented some projects which aim to circumvent the connectivity issue in creative

ways. One of such projects is Freedom Toasters. This South African project has located sixteen, self-contained, computer-based, CD-burning-facilities across South Africa and Namibia. These 'Freedom Toasters' are preloaded to dispense free digital products, including software, photography, music and literature which users can download and burn for free on the spot²⁷. Vincent is positive about the project: "I do think that projects such as freedom toasters make it easier to download materials into local communities that don't have broadband access." Another possible solution has been developed by MIT. MIT has installed 72 so called 'mirror sites' all over the developing world. These mirror sites are snapshots of the entire MIT OpenCourseWare web site that MIT puts these snapshots on hard drives and ships them to universities who request them. These universities can then upload these snapshots to their local server and as such circumvent the problem insufficient bandwidth (Open Universiteit Nederland, 2006: 13). These projects though, basically export Western knowledge. Nonetheless similar approaches can also be used by African universities to increase access to African knowledge.

Other opportunities which can enable OER to increase access to scientific knowledge and educational facilities come from the advancements made in the areas of rich media, virtual environments, gaming, e-science and cyber-infrastructure. Learning experiences of students can for instance be enriched by setting up virtual learning environments with virtual educational facilities. Hammond argues in the latest Hewlett report: "There is enormous opportunity for synergy and mutual benefit between the international e-science/CI movement and the international OER movement, particularly in evolving to the next phase: an open participatory learning infrastructure in service of learning and discovery" (Atkins, Brown & Hammond, 2007:50). Another great development for OER to improve access to knowledge, which deals specifically with copyrights issues comes from the recent success of the so called 'Creative Commons'-licenses as developed by Creative Commons²⁸, an organization founded by Larry Lessig of Stanford. These flexible copyright licences enable copyright holders to grant some of their rights to the public while retaining others, by a variety of licensing and contract schemes. As the pool of people using these licences is almost exponentially growing, a larger collection of knowledge will become openly accessible to scholars and students all over the world.

²⁷ <http://www.freedomtoaster.org/home>

²⁸ <http://creativecommons.org>

3.2.5 Threats to OER in relation to a lack of access at universities to educational facilities and scientific information

Although costs of ICT-equipment and internet access are lowering, this problem remains far from solved. And even if the equipment would become available, many teachers and students will lack the necessary computer literacy in order to use it. In addition, there is a perception challenge. Many teachers and students who are in the fortunate position to have access often only use them to check their e-mails. These challenges will come back several times under different headings and will be further discussed in chapter Seven. Another big issue is a lack of access to free content, as Mackintosh explains: “We have a far greater challenge in Africa, and that is access to free content. The word ‘access’ is often used as an excuse to focus on technology. That is just a side issue.” This may or may not be true, depending on ones perspective. Nonetheless, even though the recent success of creative commons licences has raised some hopes that the current restrictive copyrights regimes, endorsed by the WTO and TRIPPS, may be broken, there is still a long way to go. This poses especially a threat to developing nations. D’Antoni comments: “The costs of access to scientific information are prohibitory, even in developed countries. That means that countries with low level economies are greatly disadvantaged in the scientific community.” The current intellectual property regimes are actually so inimical to the whole OER-movement that they will be separately examined in paragraph 6.2. Other challenges include issues of equity and more importantly the danger, that Africans might become mere consumers of Western knowledge instead of producers of their own knowledge. For instance, Bateman’s first response to the question of how OER can improve access to scientific knowledge and educational facilities was that a one way flow of educational materials should be avoided. The practical sides of this issue will be discussed in paragraph 3.3, 3.5 and 3.6, while the socio-economic aspect of this threat will be explained in further detail in paragraph 4.2.

3.2.6 Analysis

OER can be a cost effective solution to improve access to scientific information and to some extend also to educational facilities. A significant threat to this is posed by the current intellectual property regimes, as codified by the WTO TRIPPS agreements. If the current growth of the usage of creative common licenses and other similar licenses continues, this

threat can be countered to some extent. It is pertinent that also African knowledge will be released under such licenses in order to prevent a one-way flow of information from the West to Africa. And although OER can't provide physical educational facilities or replace for instance real laboratories, they can provide some virtual educational facilities. Further development of such facilities can benefit from progress made in the areas of rich media, virtual environments, gaming, e-science and cyber infrastructure. However, the biggest weakness is that Africans can only benefit from OER when they have access to ICT-equipment, which OER can't provide. Nonetheless, the ICT-initiative implemented by the University of Dar Es Salaam demonstrates that by adopting a business model which strikes a balance between private and public interests this problem can be overcome. The lowering costs of ICT equipment and bandwidth also provide opportunities in this respect. To circumvent the bandwidth issue in the short term, some African universities could investigate whether they can adopt similar solutions as provided by the freedom toasters - and MIT-mirror site projects.

3.3 Lack of opportunities for African scholars to disseminate their scientific work

3.3.1 The Problem

Another problem which is interrelated to the problem of lack of access to educational and scientific information is the lack of opportunities for African scholars to disseminate scientific output they produce. In Africa, the amount of Academic journals is declining and the remaining journals, numbering perhaps 150, are vulnerable. Moreover, in addition to resources constraints, Africans are often exposed to simple prejudice when they wish to contribute to international scientific journals (Lor & Britz, 2003: 2). In addition, scholarly publishing needs vibrant universities with state of the art education in order to flourish²⁹. Thus, with the general decline of tertiary education in Africa, the possibilities for African scholars to disseminate their scientific work have also decreased. Therefore, it is relevant to ask the following question:

²⁹ <http://www.inasp.info/psi/arusha/summary.html>

Can OER help enable African scholars to disseminate their academic work?

3.3.2 Strengths of OER to increase opportunities for African scholars to disseminate their academic work

All respondents agreed that OER offer great potentials for African scholars to disseminate their scientific work. First of all, OER provides new opportunities for African scholars to publish their work without necessarily needing a well developed publishing sector. This sector is just not present in most parts of Sub-Saharan Africa. African academics can simply put their own content online under a creative commons license in for instance the wiki-like environment which FLOSS4edu uses. To reach a higher profile, they can also publish their articles in online OER e-journals, which they can set up by themselves or in collaboration with various African universities.

Several projects, embracing an OER approach, have already been initiated to enable African scholars disseminate their work to the rest of the world, such as for instance the already mentioned Floss4Edu project which aims to inspire as many Africans as possible to put their works on the net. Another project which can serve as a basis of inspiration for strengthening high profile scholarly publishing in Africa is Arusha³⁰, initiated by the International Network for the Availability of Scientific Publications. An OER initiative which also could help Africans setting up initiatives in this direction is the African e-Journals Project³¹ a collaborative effort of Michigan State University, the Association of African Universities and the African Studies Association. Their mission is to improve the accessibility, visibility, and viability of African journals by helping African journals develop full-text digital versions of current issues and back issues. Their website provides a directory of journals about Africa which contains information about where to find tables of contents and abstracts, full text of articles online, journal web pages and where they are available. Moreover, full-text archives are freely accessible with back issues of eleven scholarly journals published in Africa in the social sciences and humanities. In addition, the site provides links to other important websites

³⁰ <http://www.inasp.info/psi/arusha/>

³¹ <http://africa.msu.edu/AEJP/>

devoted to increasing the accessibility of African journals as well as links to digital libraries about Africa.

Practical OER-tools to aid further projects in this direction are OER that specifically train scholars to create their own OER-content. Already many OER-projects have been initiated specifically aimed at providing tools for creating OER, such as the tools provided by the connexions-project or eduCommons, an OpenCourseWare management system designed by Utah State University, just to name a few³².

3.3.3 Weaknesses of OER to help enable African scholars to disseminate their academic work

Although African scholars might circumvent the problem of weak publishing sector in Africa by electronically publishing OER materials, this will also not contribute to develop a commercially viable publishing business. Actually, as there is an unsaturated market in Africa in this respect, it might destroy the already weak publishing structure. Hoffmann explains: “OER may jeopardize the development of a publishing industry in developing countries, as we are dealing here with unsaturated markets”

3.3.4 Opportunities for OER to help enable African scholars to disseminate their academic work

Most of the opportunities mentioned under ‘lack of access to scientific knowledge and educational facilities’ (see paragraph 3.2.4) also apply to enabling African scholars to disseminate their academic work. Opportunities to improve access to computers and the internet for instance, apply too to African scholars who wish to disseminate their academic work. However, the fact that the amount of scholars is usually much lower than the amount of students, provides extra opportunity, as it is easier to provide a small pool of scholars with computers, access to the internet and training than thousands of students. Moreover, as already mentioned in paragraph 3.2.4, African Universities could develop similar projects like Freedom Toasters of the MIT mirror sites in order to disseminate African scholarly work among

³² For more projects with similar aims, see Atkins, Brown & Hammond, pp. 20-21

Africans who lack access to sufficient bandwidth. In addition, the use of Creative Commons Licences or similar licences can also enhance the dissemination of African scholarly work; especially among African Universities who usually lack resources to pay high fees of commercially exploited scientific journals. Moreover, the fact that low wages often force many professors in Sub Saharan Africa to take on second jobs, ironically also provides opportunities: The preparation of OER-materials could be a valuable additional source of income (Albright, 2005: 9).

3.3.5 Threats for OER to help enable African scholars to disseminate their academic work

As shown above, most of the opportunities mentioned with regards to improving access to scientific knowledge and educational facilities also apply in some form in relation to enabling African scholar to disseminate their academic work. Unfortunately, the same can be said about the threats. It is for instance evident that ICT-infrastructure poses also in this area a serious challenge. Apart from these, an additional threat for African scholars to engage themselves in the production of OER has to do with time constraints; especially when the creation of such materials is not rewarded, whether financially or by promotion. There is also a danger that African scholars might fear to give their knowledge away for free and would prefer to sell it to publishers, even though they might not make a lot of money out of it and if that would inhibit the dissemination of their work among fellow Africans and the rest of the world. This threat is reinforced by the current international research climate which favours the promotion of scholars based on publications in international scientific journals, mainly owned by the West. Thus, African scholars who put their work on the internet outside the circuit of commercial international journals fear not to be taken seriously by the scientific community, and therefore they might prefer not to engage themselves in the OER movement. On the other hand, most African scholars are not publishing their works in these international scientific journals anyways. Only one percent of all scientific articles in these journals originate from Africa. Thus it seems that most African scholars will be better off anyways by looking into new ways for publishing their work

3.3.6 Analysis

OER offer great potentials for African scholars to disseminate their academic work, as it can circumvent the problem of a weak publishing sector and at the same time reach as many Africans and people in the rest of the world as possible by taking away financial barriers for people to access their work. Several projects have already demonstrated its potential, ranging from the all-inclusive approach of FLOSS4edu to the highly sophisticated OER e-journals as developed by for instance the African e-Journals Project. Using creative commons licences or other similar licences can assist in establishing such new publishing initiatives. However, as in most African countries the publishing market is very weak and unsaturated, OER might inhibit progress this already weak sector. On the other hand, it might also lead to the establishment of a viable publishing sector, be it in a more open and transparent way.

A significant obstacle for OER to be successful in this respect is again though, the availability of computers and access to the internet. Nonetheless, again similar opportunities apply as mentioned under 3.2.4 deal with this problem. However, the pool of academic scholars is considerably smaller as the pool of students. This makes the problem of access to and skills to use ICT-equipment a little bit less massive. Another problem is that African scholars might be reluctant to give their knowledge away for free, out of fear to lose possible revenue or to not be taken seriously by the international scientific community. These fears can be taken away if universities or other institutions establish a structure of incentives which enables payment to African scholars who release their work under an open license and at the same time relates promotion of and rewards to academic scholars to the quality and quantity of the open content produced by them. However, establishing such structure will not be easy.

3.4 Overcrowded universities

3.4.1 The Problem

A task force convened by the World Bank and UNESCO calculated that the number of higher education students in Sub Saharan Africa increased almost ten-fold over two decades, from

181,000 in 1975 to 1,750,000 in 1995. However, in the mid-1990s, still less than 4 percent of African young adults were enrolled, compared to only 10 percent in all developing countries and 60 percent in industrialised nations (Bollag, 2004: 3). For a large part, this low percentage can be explained by the population boom Africa has seen during the last decades. For instance, in 1999, at least 16 countries needed to double their current tertiary enrolments over the coming decade, just to enable a constant share of their population to aim at tertiary level qualifications (Saint, 1999: 3). Adding to this problem is the HIV/Aids epidemic in Africa, which accounts for 70 percent of all new Aids cases in the world. The losses of many young lives lead to higher dropout rates, as Tucker laments: “In Africa we have problems with aids. A lot of teachers and students are just dying” Therefore, many African universities are constantly increasing their enrolment rates while at the same time having less teachers to their disposal, leading to overcrowded universities without an adequate amount of teachers to assure a certain quality standard. Hence the following question, which focuses specifically on learner centred models of OER (without assuming that other models might not be useful) becomes important:

Can learner centred OER alleviate the problem of overcrowded universities by servicing better larger numbers of students with few available teachers?

3.4.2 Strengths of learner centred OER in alleviating the problem of overcrowded universities

Proponents of ‘new wave’-learner centred models of OER argue that learner-centred OER can be used to employ less teachers, while servicing large enrolment rates. Thus, on first sight, learner-centred OER seem to be a good solution to Africa’s problem of overcrowded universities. Malukka argues for instance that learner based OER are ideal to improve enrolment rates, while Selinger emphasizes that distance teachers don’t need much administrative support and buildings. Therefore you can triple the amount of teachers at a small additional cost. Similar gains can be made though for regular e-learning solutions. So what would be the advantage of using learner centred OER over traditional e-learning solutions? The answer can be found in the values of collaborative development and free knowledge sharing which most proponents of OER promote. As Mackintosh puts it more or less:

- 1) Development costs can be shared by collaboratively developing courses with peers from other universities or university departments
- 2) Free exchange of learner centred materials and expertise about how to create these will enhance the quality of these materials
- 3) Collaborative projects can also reach more students and thus easier reach economies of scale.

Similar arguments have been put forward and successfully applied before by the open source movement with regards to software. However, education is of course not the same as a good software product and we have to be careful to assume that what would work for software would also work for education. Nonetheless, the open-source based arguments demonstrate some inherent strengths learner-centred OER might possess over regular e-learning solutions.

3.4.3 Weaknesses of learner centred OER to alleviate the problem of overcrowded universities

Apart from the production, maintenance and access side, where huge gains can be made through knowledge sharing and collaboration, learner centred OER are not much different from regular e-learning solutions. Therefore learner centred OER will be prone to similar problems. First of all, it is expensive to develop high quality learner-centred OER. The African Virtual University is now experiencing some serious difficulties regarding its funding partly because of this. Moreover, learner-centred teaching models cannot only reach large economies of scale but also need this scalability in order to become effective and this can be a problem: although higher enrolment rates are needed, this doesn't necessarily mean that everybody should be taught the same subjects, as there is also a great educational need to diversify educational programs. Moreover, as is also the case in other parts of the world, face-to-face teaching remains indispensable to many students as some courses are just not suitable for e-learning approaches, like for example practical courses in laboratory skills.

In addition, e-learning doesn't always improve the student-teacher as effective as is usually assumed. For example, Selinger found while working for the Open University of the United Kingdom, that class sizes are not always that big. Moreover, in some cases, the same amount of teachers is still needed for assessment. Teachers must be still present and e-learning solutions

can not be seen as a replacement for teachers, as Thébault explains: “Their training role and mission change, but the amount of teachers will not lower” Or as David Vincent, the Vice-Chancellor of the OUK puts it: “Learning requires support in some form. Moreover, employing fewer teachers wouldn’t only not economise on teachers. It also wouldn’t take away the need to give some form of support to the learners.” And this is precisely the Achilles heel of the learner centred OER which have been developed so far by distance learning universities: Their OER-courses don’t make use of teachers and are not assessed, while any other e-learning course provided by them do.

3.4.4 Opportunities for learner centred models of OER in relation to overcrowded universities

Although learner centred OER cannot replace teachers, they might be useful to complement the quality and effectiveness of the education offered by teacher and the learning-experience of students. As such, learner centred OER become an instrument at the disposal of teachers and students without undoing the need to face-to-face interaction. Thébault: “If OER are quality contents, they should be a great support to improve the quality of education”. In addition, in some cases learner centred OER have already successfully been utilized to employ fewer teachers while servicing a growing population of students.

A project utilizing ICT, again started by the University of Dar Es Salaam (see also paragraph 3.2.4), Tanzania, though not an OER initiative, can serve as a source of inspiration. A 2003 World Bank Review reports (Bollag, 2003: 7):

The law faculty became the first at UDSM to introduce a web-based platform through which students can access class reading assignments, take exams, submit homework, and participate in class discussion groups. The move was motivated by the expansion in enrolments, meaning that law professors could no longer devote much individual attention to their students. “It’s a way of getting around the numbers issue,” says Ibrahim H. Juma, Associate Dean of the Law Faculty. “A professor can’t talk to everyone, so he’ll use an internet chat room. He’ll say: ‘from 7 to 8 pm I’ll be on my computer, and anyone with questions can log on.’ Still, laments Mr. Juma, “the close contact has been lost”

3.4.5 Threats to learner centred models of OER in relation to overcrowded universities

Besides the access problem though, one of the biggest challenges is that learner centred models of OER cannot address on its own many of the root problems that lead to overcrowding, such as for instance the high drop-out rates of teachers due to HIV or simply due to the fact that the demand for tertiary education is simply too big. Mackintosh explains: “Even if you go down to the participation rates for secondary education, in most parts of the developing world we are not going to achieve universal secondary education by 2015, let alone reasonable participation rates for tertiary education. We just don’t have enough money to build enough universities. So I think the problem is far greater than just reducing overcrowded universities through e-learning solutions.”

Apart from these challenges, there are also major threats to the viability of the concept of learner centred OER itself. One of them has again to do with perceptions: according to Alex, there is a perception barrier that should be overcome (see also paragraph 7.3.1). Many people believe that the quality of education can’t be assured without face-to-face interaction. This is especially so in Africa, where respect for the authority of the teacher forms a basic part of the value system connected to education. However, to some extent this challenge is not only a matter of perceptions, as real life contact as a way of learning from human beings belongs to a basic human need. This is also the case in other parts of the world, where also face-to-face teaching will remain indispensable to many students and teachers.

In addition, there is another challenge, which has to do with the autonomy of the teacher and the relation of learner-centred OER to the local social context (see also chapter seven). A former director of a training center of the AVU explains for instance that the bulk of their e-learning courses had been developed by the RMIT of Australia, without including the actual teachers in their development and complained: “The management of the AVU..(added by author) only told us: here is some good program. Give it to students and then we develop capacity for Africa” However, this problem of autonomy and localisation is not only confined to Africa. Traxler identifies similar problems in the United Kingdom:

“E-learning has always been sold to managers instead to teachers as economies of scale. This can translate into redundant lecturers and teachers, or into a polarization of the profession into high end content developers working in teams with all sorts of specialists support to develop learning object technologies and then the kind of bulk rank and file who just deliver the stuff. Certainly the universities in the UK are infected with the not-invented-here kind of syndrome. University teachers will rather develop their own courses than buy somebody else’s. In terms of OER that presents challenges that have partly to do with ownership and localisation. There is a need to understand and adapt to the social and organisational settings in which people work. To what extent can learner centred OER actually have sufficient specificity, especially in Africa?”

3.4.6 Analysis

E-learning solutions have already been used in Africa in order to deal with overcrowded universities. Learner-centred solutions might work, although in many cases their development is quite expensive. A great opportunity for learner centred OER is in this respect that they can reduce the costs of development and improve the quality of e-learning courses through collaborative development and free knowledge sharing. Nonetheless, there is a perception challenge on the part of teacher and learners that the quality of education cannot be assured without face-to-face interaction. This to some extent credible threat is reinforced by the fact that the learner centred OER which have been developed so far lack developed mechanisms for assessing the progress of learners. In addition, teachers might be reluctant to teach courses in which they don’t share ownership, especially when such courses are not sufficiently adapted to the local context.

Thus, for a successful application of learner centred OER, local teachers should be included in the development process. Assessment procedures which enable local teachers to assess the progress of their students in their own way should be incorporated into these e-learning materials. This might not only reduce the development costs of learner Centred OER, it might also increase the sense of ownership on the part of the teachers. In addition, including local teacher the development process will improve the quality of the content through the process of free knowledge sharing. This approach might also demonstrate teachers that learner centred OER can complement and enhance the quality of their coursework without being a threat to

their existence; even well established distance teaching universities cannot function without them. Nonetheless, even if learner-centred models were successfully applied at universities in Africa, they will still not solve the root problems of overcrowding. However, they might help alleviate some in combination with other models of OER. The problem of high drop-out rates of teachers and students due to HIV can for instance be addressed by utilizing all sorts of OER for raising awareness and improving health skills; ranging from content-centred articles about HIV to learner-centred workshops how to raise awareness to creation-centred discussion forums.

3.5 Lack of availability of qualified teachers

3.5.1 The problem

The combination of overcrowded universities with poor facilities and extremely low wages, compounded by the problems of aids and brain drain, makes it very difficult for African universities to attract qualified professors and staff. And those professors who did not move to developed countries often are forced to supplement their university incomes with wage-earning jobs. Thus, most African universities are seriously understaffed (Hoffmann, 1996: 85). Also high schools and elementary schools have difficulties in finding qualified teachers. The last paragraph focused on how OER as learning materials could improve the learning experience of students. However, as also the former paragraph showed, learning materials can only take you so far and can not replace teachers. Cappelle: “research shows that the pupil-teacher ratio is nowhere near as important as the quality of the teacher.” Hence the following question becomes pertinent:

Can OER improve the availability of qualified teachers?

3.5.2 Strengths of OER to solve the problem of a lack of availability of qualified teachers

OER's special relevance for lifelong learning makes it a useful cost effective tool for teachers who like to update their knowledge and skills. This is especially so, as most teachers are underpaid, while universities and schools lack the resources to accommodate extra training. In addition, not only students but also teachers can use, adapt or even better, create - all kinds of OER in order to enhance their and their peers' quality of teaching. A fortunate side-effect of using OER in such a way is that it can also enhance computer literacy of teachers who already understand the basic functions of a computer. Again the core values of OER movement of collaboration and free knowledge sharing are important in this respect: by freely sharing expertise about the teaching process and by collaboratively reviewing each others work, teachers can not only enhance their knowledge and skills, but also use, adapt and create new teaching materials, methods and pedagogies. In principle, OER could play a role in this on all levels of teaching, ranging from elementary school to tertiary education. As shown in paragraph 2.3, there have actually some OER projects been set up with specifically the goal of training teachers: for instance, the STAMP 2000+ project executed by the Southern African Development Community and the more recent Teacher's Education in Sub Saharan Africa program (TESSA)³³.

3.5.3 Weaknesses of OER in relation to a lack of availability of qualified teachers

A weakness of OER is that they themselves cannot make a teacher a good teacher. Moreover, the extra content they can provide is not always needed. Marquard: "for some courses, providing teachers with more content doesn't help them." However, this depends evidently on the subject of the course and on the level of education. For instance, a professor in contemporary political science on the university level will need to update his knowledge on the

³³ TESSA is being led by The Open University (UK) and the African Virtual University (AVU) based in Nairobi, Kenya and is working with a consortium. This consortium³³ is made up of fourteen African universities from Kenya, Rwanda, Uganda, Nigeria, Sudan, Tanzania, Ghana, Zambia and South Africa and of two more international institutions, the BBC World Trust and the Commonwealth of Learning, in addition to the Open University (UK) and the AVU. All the TESSA resources are being developed as OER. During the first phase, TESSA will focus on core teaching skills at the primary level, which include literacy, numeracy, science, life skills, social studies and the arts. The TESSA materials are versioned to national and language specific versions and most of them will be printable. In the first instance the resources will be available in five languages: Arabic, English, French, Kiswahili and isi-Xhosa. More importantly though is that to some extent TESSA resources can also be adapted by local teachers, when the aim is to upload them again to the TESSA site. In addition, any TESSA material can be changed and adapted by anyone, whether for non-commercial or commercial purposes.

subject all the time, while a teacher on an elementary school teaching children how to count on elementary school won't need to be informed on whether two plus two is four. Nonetheless, with respect to teaching how to count, as teacher might benefit from OER by learning new pedagogical methods. However, some of the inherent qualities of good teachers cannot just simply be taught by updating teachers with more content or pedagogical skills or by stimulating teachers to put their content on the web. Teaching methods of some of the best teachers can be quite idiosyncratic. What precisely makes someone a good teacher is often as hard to define, just like it is difficult to explain why for instance someone is deemed to have a good sense of humor.

3.5.4. Opportunities of OER in relation to a lack of availability of qualified teachers

Similar opportunities mentioned under paragraph 3.2.4 and 3.3.4 with regards to improving access and the dissemination of knowledge also apply here. And again, similar to the argument made in paragraph 3.3.4, it is also easier to provide a small pool of teachers with access to computers and the internet than the much larger pool of pupils and students. In addition, the idea to financially or promotional reward the creation of new OER materials can also be applied to teachers. Moreover, the tight labour market in many African countries can also motivate teachers to upgrade their skills. For instance, according to Negash the problem is not that there is a shortage of teachers in Africa: "There is a huge unemployment, so they don't want to reduce the amount of teachers, there are plenty of teachers. The problem though, is finding qualified teachers." The current wave of liberalisation and competition which is sweeping all over the world, will most likely favour engaged teachers or prospective teachers who are constantly upgrading their skills over less motivated teachers. This provides chances for OER, as they might increase the prospect for teachers to find or keep their jobs.

3.5.5 Threats to OER in relation to a lack of availability of qualified teachers

As argued many times before, OER can only be used when people have access to computers and have sufficient computer literacy to use them. In addition, there is a shortage of qualified ICT-personnel, much needed to assist teachers in accessing and creating OER. In addition, as said before, the heavy workload of teachers might also be a reason that most of them will lack

the time to become involved in using OER materials to upgrade their and their peers teaching skills. And just like with learner centred models of OER, there is a perception challenge: this time the challenge is not whether OER can provide quality education, but whether OER can actually contribute to the knowledge and skills of teachers. Some teachers might doubt the need to learn anything new, as they might think -and sometimes rightfully – that they already know everything they have to know. Such challenges will be dealt with in more detail in chapter seven.

3.5.6 Analysis

A major strength of OER to increase the availability of qualified teachers comes from its inherent relevance for lifelong learning, especially for those who lack the resources to pay for extra training. Tight labour markets and increased competition among teachers make lifelong learning even more important and hence opens up chances for OER to upgrade skills of teachers on all levels of teaching. Although some teachers might have the perception that there is nothing new for them to know, this perception may however be challenged by such competition. Moreover, OER might also be used as a platform by teachers to create, adapt and disseminate teaching materials and to share expertise. The core values of collaboration and knowledge sharing of OER make them especially suitable for this. This approach has already been adopted before by STAMP 2000+ and now by the TESSA programme and offers great prospects to enhance the quality of education offered by teachers. Nonetheless, OER cannot make by themselves teachers good teachers. Also, extra content provided by OER might sometimes not be necessary depending on the level and subject of teaching. In addition - as is true for all OER initiatives in Africa - problems with regards to access to ICT and computer literacy will also remain a major obstacle. At the same time, when OER is found to be useful by teachers, it can also enhance their ICT skills and those of their pupils and students.

3.6 Irrelevance of education to African needs

3.6.1 The problem

Another recurring problem is that the educational systems in place often fail to educate their students according to the needs demanded by society. To some extent, this is not a problem, as this is a feature of academia, especially of the so called 'pure' sciences. However, on the whole it is a problem, as most people like to educate themselves with the prospect of being able to find a better job. Many educationalists have deplored the lack of relevance of education to African needs. Sir T. Wallbank noted for instance already in 1934 that "Much of the education offered to the African was not truly adapted to his needs, and was concentrated on materials that functioned but little in the later real life experience of the native" (Wallbank, 1934: 109). Unfortunately, since then not a lot has changed in this respect. Klaus Seitz argues for instance, that education and training offerings should be linked more to the labour market and above all the creation of jobs for young people and that most universities are too school centric, traditional and inflexible in their educational programs. Furthermore, he argues that the pluralisation of education and the recognition of informal learning achievements should be better accommodated, especially given the current perspective of life-long learning. Moreover, according to Seitz, there is not sufficient mobilisation of competences in a multifaceted education system as the basis for innovations, and for the creation of appropriate technologies in line with the level of development, or the adaptation of alien technologies to African needs (Seitz, 2004: 5, 55).

One of the reasons for this mismatch between African tertiary education and African needs can be found in Africa's colonial past. something again already in 1934 identified by Wallbank: "Fundamentally, the most serious evil in the African educational system had been that it was too often an alien structure, imported bodily from England, with little idea as to whether it met the peculiar conditions and needs of a primitive African society" (Wallbank, 1934: 117). On the one hand, this quote demonstrates the imperialistic discourse of that time: nowadays no well-educated person would consider African society to be primitive and 'African needs' refer nowadays rather to highly sophisticated skills than to the sort of the 'dumbed down' needs Wallbank implies to refer to by using the words 'peculiar' and 'primitive'. On the other hand, it is also a testimony of how the western educational system was just transplanted to Africa.

Unfortunately, many African university systems are still based on this alien old fashion western elitist model, even though many universities have made the transition to mass education. As a result, many graduates remain unemployed, representing a tragic squandering of scarce resources. (Bollag, 2004: 4). Thus the relevance of the following question:

How can OER make African education more relevant to African needs?
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3.6.2 Strengths of OER in relation to irrelevance of education to African needs

OER offers great prospects for making education more relevant to African needs. First of all, OER can be good tools to enhance life-long learning, which also in the West has become indispensable to educating and updating people according to the needs of the labour market. In addition, the open structure and philosophy of OER can make a university education more flexible and thus more adaptable to local demands. Moreover, most of the respondents agreed that once Africans themselves begin developing and adapting content instead of relying mostly on developed countries to produce it, OER has the potential to generate and become a treasure of local knowledge geared towards finding solutions for local problems. Tucker: “By involving Africans in the production re-contextualisation, translation and localisation of OER, education can become more relevant to African needs.” Likewise, Hoffmann reasons: “If OER come as fixed packages that you either consume or you leave it, then this will certainly cause a problem in the sense that they cannot be used in practice. However, if OER can be modified, customized or created by Africans, then things can definitely be tailored to African needs.”

3.6.3 Weaknesses of OER in relation to irrelevance of education to African needs:

The biggest strength of OER in this respect, the possibility of creating a large pool of African knowledge created by Africans, is however also OER biggest weakness: as for now, most OER originate from the West and are not produced by Africans nor adapted to the local context (See also Paragraph 2.3, 3.2.5 and 4.2). D’Antoni explains for instance: “How can OER make African education more relevant to African needs? I actually think that OER could make it worse. In a sense, we are using without adaptations the materials that were developed for other countries, other cultures, other situations. The problem is similar to accessing and using

textbooks that have been conceptualized and prepared in and for a different situation.” This weakness is particularly ‘strong’ in relation to non-African OER that make use fixed formats such as for instance PDF that cannot be changed and thus are hard to re-contextualise and localize, as for instance MIT OpenCourseWare does. On the other hand, more flexible formats of OER are likely to need more bandwidth, which would make it also hard for many Africans to re-contextualise and localise such materials.

3.6.4 Opportunities for OER in relation to irrelevance of education to African needs

It is obvious that in principle all enablers of OER geared towards knowledge creation and adaptation can be seen as opportunities for making education more relevant to African needs. Creation and adaptation of OER can be facilitated by many different means, whether technical, sociological, cultural or pedagogical. Most of these enablers are related to issues of implementation though, and will to some extent be examined separately in chapter seven. ‘To some extent’, because it is of course impossible to be complete in this respect, especially as ‘needs’ can be defined in many different ways, each time depending on the specific local context. The largely informal economies of Sub Saharan countries though, seem to make the concept of ‘life-long learning’ especially relevant. This offers especially opportunities for learner-centred OER created by Africans, although research is needed to substantiate this claim. A source of inspiration for how to create knowledge adapted to local needs is the Kigali Institute of Technology (KIST), Rwanda (Bollag, 2004: 24-26). KIST designs technologies that suit specific needs of local people such as for instance low-cost hand and foot powered water pumps or rainwater-harvesting systems. Unfortunately though, KIST operates on a commercial model that doesn’t disclose local generated knowledge to the public. If somehow the knowledge generated by such projects could become part of the public domain, then the spill-over effects for strengthening the capacity to generate relevant local knowledge could be substantial. OER could build upon such already existing projects which enable Africans to create and adapt knowledge in accordance with their local needs.

3.6.5 Threats for OER in relation to irrelevance of education to African needs

In principle, also all factors obstructing OER geared towards knowledge creation and adaptation can be seen as threats to making education more relevant to African needs. Apart from these threats there is however a more fundamental threat which has to do with a possible mismatch between the nature of OER and the dynamics of African labour markets: OER typically offer potentials for training high skilled workers. However, as Hoffmann explains, many African economies often lack the capacity to bring these people into the labour force, especially in countries that have voluntary or involuntary embarked on structural adjustment or austerity programs that have a tendency to reduce the need for such skills (Hoffmann, 1996: 86). Another challenge for OER to make education more relevant to African needs is institutional entrenchment and unwillingness to change or to abandon irrelevant academic curricula. The rigidity and slowness of bureaucratic systems shouldn't be underestimated. This is however an issue about the implementation of OER that will be covered in paragraph 6.5.

3.6.6 Analysis

Most OER do not originate in Africa at the moment. Hence there is a risk that OER will only make education less relevant to African needs, especially those OER that use inflexible formats such as PDF that are difficult to edit or on the other hand too sophisticated formats of OER that use too much bandwidth. A balance between these two opposites should be sought depending on the local situation. Nonetheless, OER offer great potentials: first of all by their contribution to life-long learning, which seems on first sight to especially accommodate the informal nature of most Sub Saharan economies. On the other hand, OER typically produce high skilled workers which the labour markets of such economies might be unable to adsorb. Nonetheless, the philosophy of OER of openness seems to promote by itself flexibility in learning, which can also contribute to make education more relevant. More importantly though, is the potential of OER to generate and become a treasure of local knowledge geared towards finding solutions for local problems. However, this will not happen overnight and there are many factors which can inhibit or spur this process, depending on local situations.

3.7 Conclusion

Strengths

OER can be a cost effective solution to improve access to scientific knowledge and to create virtual educational environments. Moreover, they offer great potentials for African scholars to disseminate their academic work, although this might be a threat to the development of an already weak publishing sector. Another strength of OER is that they can reduce the costs of development and improve the quality for instance e-learning courses through collaborative development and free knowledge sharing. Nonetheless, even if learner-centred models were successfully applied at universities in Africa, they will still not solve the root problems of overcrowding. However, they might help alleviate some in combination with other models of OER. The problem of high drop-out rates of teachers and students due to HIV can for instance be addressed by utilizing all sorts of OER for raising awareness and improving health skills. In addition, the suitability of learner centred OER to provide low cost opportunities for lifelong learning makes OER a useful tool to increase the availability of qualified teachers. Furthermore, OER can and are used as a platform by teachers to create, adapt and disseminate teaching materials and to share expertise. As such, OER have the potential to generate and become a treasure of local knowledge geared towards finding solutions for local problems and thus make African education more relevant to African needs.

Weaknesses

However, a big weakness is that Africans can only benefit from OER when they have access to ICT-equipment and have the skills to use it. Nonetheless, OER can also improve such skills. Nonetheless, although OER might be able to improve access to scientific information, OER can't provide physical educational facilities or replace for instance real laboratories. In addition, learner-centred OER are prone to similar problems as other e-learning solutions which aim to deal with overcrowded universities: they are expensive and need economies of scale and their teacher student ratio is not always that effective as assumed. Furthermore, OER cannot make by themselves teachers good teachers, and as such they might not be able to contribute to better qualified teachers. In addition, extra content provided by OER might sometimes not be necessary depending on the level and subject of teaching. Moreover, OER typically produce high skilled workers which the labour markets of such economies might be unable to adsorb. Thus, it remains to be seen whether OER can really make African education

more relevant to African needs. Moreover, most OER do not originate in Africa at the moment. Hence there is a risk that OER will only make education less relevant to the African context.

Opportunities

Lowering costs of ICT equipment and bandwidth provide opportunities for OER. In addition, to circumvent the bandwidth issue in the short term, some African universities could investigate whether they can adopt similar solutions as provided by the freedom toasters - and MIT-mirror site projects. Apart from this, opportunities for OER to improve access to scientific knowledge and educational facilities come from progress made in the areas of rich media, virtual environments, gaming, e-science and cyber infrastructure. In addition, if well implemented, OER might lead to the establishment of a more cost-effective publishing sector from which not only learners, but also scholars and universities will benefit more than before.

Threats

There are some significant threats to OER itself. One is posed by current intellectual property regimes, which inhibit free access to scientific information. If the current growth of the usage of creative common licenses and other similar licenses continues, this threat can be countered to some extent. It is pertinent that also African knowledge will be released under such licenses in order to prevent a one-way flow of information from the West to Africa. However, African scholars might be reluctant to give their knowledge away for free, out of fear to loose possible revenue or to not be taken seriously by the international scientific community, and thus loose sight of the opportunities provided by OER to disseminate their academic work. These fears can be taken away if universities or other institutions establish a structure of incentives which enables payment to African scholars to release their work under an open license and at the same time relates promotion of and rewards to the quality and quantity of the open content produced by them. However, establishing such structure will not be easy

Moreover, learner-centred OER might not be used at all by teachers to deal with situations of overcrowding as many believe that the quality of education cannot be assured without face-to-face interaction. This to some extent credible threat is reinforced by the fact that the learner centred OER which have been developed so far lack developed mechanisms for assessing the progress of learners. In addition, teachers might see learner centred OER as a threat to their existence and might be reluctant to teach courses in which they don't share ownership, especially when such courses are not sufficiently adapted to the local context. Also, some

teachers might have the perception that there is nothing new for them to know. Furthermore, there are some pedagogical challenges, especially in the context of using OER to upgrade the skills of teachers on the primary school level. Thus, teachers might not be willing to participate in the creation and adaptation of OER, a prerequisite for OER to be useful to make African education more relevant to African needs.

Some concluding remarks

For OER to be helpful in improving the quality of African education and to deal with the problems covered in this chapter, one of the most important things is that Africans get involved and collaborate in the creation and adaptation of OER. First of all, this is important in order to create and adapt scientific knowledge and virtual learning environment according to African educational demands. Moreover, collaboration is needed if Africans scholars would like to initiate for instance African open access e-journals. Furthermore, collaboration, adaptation and creation by African teachers in the creation of learner-centred OER cannot only reduce the costs of OER, but also their acceptance, while at the same time increase the skills of teachers. In addition, such an approach is most likely to make African education more relevant to African needs. Nonetheless, also other models of OER might of course also be useful, depending on the context

Chapter four: How OER can or can't deal with socio-economic problems inhibiting knowledge dissemination

4.1 Introduction

This chapter will cover how OER can or can not be used in order to deal with three socio-economic problems inhibiting the effective dissemination of knowledge in Sub-Saharan Africa. The first problem is the process of information imperialism, in which the information rich dominate the production and dissemination of knowledge and use this knowledge to shape the minds of the information poor according to their interests. The second problem is the widely discussed process of brain drain, in which the best minds by socio-economic push and pull emigrate from the South to the North. Another problem that will be discussed in this chapter is the lack of access to education and knowledge to disadvantaged groups. This is of course also partly an educational issue which can also belong in the previous chapter.

Nonetheless, the fact that many people are excluded from the right to education, which puts them in a disadvantaged position, is of course in the first place a socio-economic issue. This issue poses a serious threat to the diffusion of knowledge in Africa, because how can there be an effective dissemination of knowledge if only a tiny elite of African have access to quality education? Instead of a full SWOT analysis, this chapter will use a more simplified version of this in which only examines challenges and opportunities for OER in relation to the here discussed problems.

4.2 Information Imperialism

4.2.1 The Problem

Colonialism and neo-colonialism severely affected and still affect the dissemination of knowledge in and on Africa. Colonizers shaped this knowledge according to their interest and imposed their own way of thinking on Africa. This led to an inequality in knowledge dissemination between the West and Africa. I would like to refer to this process (which did not

only affect Africa) as ‘information imperialism’. The term ‘Information imperialism’ differs from Manuel Castells’ more contemporary notion of ‘informational capitalism’ (Castells, 2000b: 68-168) in that it this kind of informational exploitation refers explicitly to its roots in Africa’s colonized past. Although the term ‘information imperialism’ has been used before by for example Mendina and Britz (2004: 15-21), no clear definition has been given. In this essay information imperialism is defined as a process by which (former) colonizers or neo-colonizers create, diffuse, use and manipulate knowledge according to their economic, political and cultural preferences and interests and impose, although perhaps unintended, this self-serving selection of knowledge upon the rest of the world.

In Africa, information imperialism led to what Thiong calls “the subjection of the colonized to Europe’s memory” (Mkandawire, 2005: 159). Hegel’s imperious statement that Africa doesn’t have a history (Hegel, 1830) is unfortunately in a sense correct, as its history has been mainly confiscated by the former colonial powers. They have played and still play a major role in appropriating and constructing Africa’s memory. Colonizers often used native Africans to obtain local information valuable to them and coded this information into their respective European languages. African Intellectuals were discouraged to write down and store their memory in their own language and according to their own selection. Thus, the storage of knowledge about Africa in European languages and according to an European selection became often the only source of documented knowledge about Africa. This led to the strange situation that when African intellectuals study the history of Africa, they often consult documentation shaped by an European outsider’s view, making them in a sense too outsiders of their own historical memory (Mkandawire, 2005: 159). However, information imperialism still affects and shapes Africa’s memory and is not only confined to colonialism. It also impinges upon contemporary trends in the sciences and education which are currently still dominated by Western powers, and especially the United States. Unfortunately, these trends have often little relevance for the African condition, as Kwesi Prah explains (Mkandawire, 2005:34):

For us who...have the benefit of middle age and hindsight, we recognise that we have in our formation been subjected to successive intellectual fashions born in the west. The intellectual fads have affected successive generations of African intellectuals and shaped their thinking on Africa and the world, but have hardly provided viable inspirational or ideological sources for transformation which translate into the betterment of the quality of life of African humanity.

One of the reasons that African intellectuals were ‘subjected to these fashions’ has of course to do with the fact that African Universities were conceived primarily as a transmission belt for Western high culture (Mkandawire, 2005: 33) and that they were for their funding often dependant upon Western powers. At times, the intention of this funding was to allow African universities to develop their own research programs. However, in practice these universities often hired western staff, who then determined the content of these programs. Moreover, many grants to universities are nowadays so called ‘project tied’ aid and therefore the west defines in this sense what knowledge Africans should focus on. This is, as Bade Onimode explains, how the system of imperialist intermediary in the larger neo-colonial economy and society is reproduced in the intellectual sphere (Mkandawire, 2005: 37).

Nonetheless, it is also important to note that many African intellectuals are just simply attracted by Western lifestyles and academic standards. However, at the same time, this enables wealthier nations to impose norms and standards which serve their interests upon developing nations. The underlying process of information imperialism can explain why African Intellectuals chose to conform to western academic standards. As said, in nowadays world, there is growing divide in who has access to information and who has not. Thus with the rise of Manuel Castell’s information society, the process of information imperialism is only likely to be intensifying, by using opportunities of ICT and increased mobility of people to exploit the unequal balance of knowledge dissemination.

Zezeza identifies three trends contributing to this inequality (Mkandawire, 2005: 224-225): First, the globalization of American scholarly societies, made possible by aggressively recruiting foreign members, including from Africa, and thus contributing to the more widely known problem of brain drain, which will be discussed later. Second: the growth of what is called ‘trans-national’ education (often involving the establishment of overseas branches of Western universities). And third: the expansion of online education (using the Internet to export curricula and instructional expertise, especially in the fields of science, engineering and business. A good example of the last two trends is unfortunately the African Virtual University, as until recently all their regular fee paying programmes, using an online e-learning format, were accredited and developed entirely by universities from abroad with a good

name.³⁴ Information imperialism, though, is of course not only confined to the African Virtual University, but a very generic obstacle to the dissemination of knowledge in general in Africa. Hence, the following question should be asked:

Is there is a danger that OER reinforces the process of information imperialism? Or can OER reverse this process?

4.2.2 How OER might reinforce the process of information imperialism

It is not difficult to see that OER is reinforcing and might continue to reinforce the process of information imperialism, as it is already happening. As has been demonstrated in paragraph 2.3, the OER movement is mainly a movement led by the developed world, what implies that mainly information relevant to the needs of the developed world will become available online for free. The whole world can for instance view the courses given by MIT, but not the other way round. The information flows mainly in one direction, partly motivated by a desire to motivate students from all over the world to get an MIT education and to improve the educational system within the university. The following quote from a spokesmen for MIT Open Courseware can illustrate this: “When we surveyed our entering undergraduate students last year, 35% of them told us they were aware of OCW before coming to MIT and that it was a significant influence on their decision to come to our university rather than the many other excellent places they could have gone to, 71% of all MIT students make use of the OpenCourseWare” (Open Universiteit Nederland, 2006: 15) In this model OER becomes part of the institutional branding of universities and thus a good way of making profits. A report on OER underlines for instance the benefits of OER by applying a capitalist neo-colonial rationale: “The education resource community is akin to any marketplace – there tends to be a domestic marketplace first and if the product is good then that quickly extends beyond borders” (Smith & Casserly, 2006: 5). However, there is no equal competition between the developed world and Sub-Saharan Africa. The initial costs of maintaining and updating an Open Course

³⁴ According to Ndege, this approach was actually endorsed by the World Bank and the Australian government by for instance funding the AVU on the condition that an Australian university would accredit and develop the courses, so that the money would flow back to Australia. This approach, though, clearly didn’t work, as due to managerial problems the AVU never paid RMIT. Most donors, including the World Bank and the Hewlett Foundation withdrew their funding and the RMIT suddenly withdrew its courses and hundreds of students suddenly couldn’t complete their courses.

Ware site are substantial (Smith & Casserly, 2006: 7), what implies that only wealthier educational institutions will be able to do this.

Nonetheless, according to Hoffmann, developing countries can have a comparative advantage over developed countries in producing OER due to lower labour costs. In addition, he argues that also more low-budget models of collaborative OER-creation could be used with less higher levels of sophistication. On the other hand, he knows from personal experience as a trainer how much effort is needed to build the capacity among teachers to create and adapt OER: “It takes months of teacher training before teachers can take advantage of it. Unfortunately, if you train people for several months, the initial costs are much higher than when you just dump a knowledge product on them.” This dumping identifies Hoffmann as another danger: “Many OER initiatives, just like open source software, are a product of oversaturated markets in the West, which dump their educational materials in under-saturated markets in Sub Saharan Africa.” As a result, and underpinned by the erroneous idea that ‘something is always better than nothing’, Africans might use any OER offered to them and this process is actually endorsed by the developed world. Bateman agrees: “The current thinking, particularly by folks in the developed world is that the way that this improvement and cost effective education will take place is because resources that are developed in the developed world will be shared and disseminated with teaching staff or educationalists in the developing world. That is a false assumption.” Thus, within the context of the broader trends of the growth of trans-national education, the expansion of online education and the globalization of American scholarly societies (as identified by Zeleza), there is a danger that OER becomes nothing more than a new neo-imperialistic instrument to exploit the unequal balance of knowledge dissemination between the developed world and the developing world.

Nevertheless, it is important to note that this outcome is in most cases not the intention of OER proponents. As explained in paragraph 3.2.4, MIT has been concerned about the low usage of their Open Course Ware site in Sub-Saharan Africa and other poorer parts of the world, due to lack of sufficient bandwidth. As said, therefore MIT has installed 72 so called ‘mirror sites’ all over the developing world, which contain snapshots of MIT content. However, notwithstanding the good intentions of MIT and other OER projects and the need for such an initiative in Sub-Saharan Africa, it might help the process of information imperialism, as these ‘mirror’ sites are mainly a ‘mirror’ of the west. On the other hand, although OER might reinforce this process on the societal level, one can also argue that OER by themselves don’t force people to use them

nor can't they replace education and as such mould African education to Western interests. Casserly argues for instance with regards to MIT OpenCourseWare: "No one has to take MIT content, but they can look at it as a baseline. You don't have to start from scratch. You pull what is appropriate for your audience and your student population. Teachers can also access OER produced by Vietnam, Latin America, China, and Vietnam. Then you will have a much better range." Similarly, Wright explains: "MIT never said it was creating elearning material nor lesson plans. It simply said that the information it uses in its courses would be made available. People can use their content or not. They weren't trying to take over the world or force content on anyone. Educators everywhere need to realize that they have choices. The Internet is a conveyor of information, it doesn't force anyone to use the information it provides. If one doesn't like material from MIT, BBC, or whatever, you don't have to use it."

Nonetheless, this assumption builds on at least two premises: 1) that people have a free will and 2) that everybody can all the time be conscious of their own choices. Whether the free will really exists or not, is a philosophical question that cannot be proved or scientifically rejected. The second premise though, is not very likely to be scientifically correct, as many research in the field of social psychology, neurology, but also discourse analysis within philosophy, sociology, linguistics and media studies have demonstrated that most of the times people select, process and memorize information unconsciously. Seen from this perspective it is obvious that when OER continue to be mainly produced in the west, they reinforce the process of information imperialism. By the way, it is noteworthy that not a single respondent of the questionnaire disagreed with this statement. Nonetheless, African teachers might not if OER comes from the developed world see this as a problem. According to Hoffmann, teachers might actually be quite happy if they could use such resources, especially in more universal fields of study such as maths, chemistry and physics.

4.2.3 How OER might alleviate the problem of information imperialism

By its very definition it follows that the process of information imperialism caused by OER can be countered when Africans start to create, remake, modify and improve OER to meet their particular economic, cultural and educational needs. There is a rich array of multicultural educational resources in Africa which just waiting for the structures and resources to transform them into OER, which can be drawn upon (Albright, 2005: 14). One could wonder though to

what extend local African educational resources will be transformed into OER, seen the inequality of the OER movement between the West and Sub Saharan Africa. Nonetheless, the Hewlett Foundation, the OER movement's most important donor, is at least aware of the inequality in the production of OER between the West and the developed world. As Dr. Cathy Casserly, a driving force behind the OER movement for the Hewlett Foundation explains for instance: "On of the big gaps in the movement is that we don't have content from the developed world. It is very unbalanced." Moreover, in an earlier article she and Smith write: "From our discussions with professors and others in the developing world, we are aware that all creators of knowledge need a place to put their materials and that knowledge flow should be multi-directional and adaptable to the local learning environment." (Smith & Casserly, 2006: 9) A similar need was identified in a forum report prepared by UNESCO's International Institute for Educational Planning (IIEP): "It was contended that OER could be improved most effectively by shifting from a provider-user model to one that employs collaborative development." (Albright, 2005: 10).

Thus, collaborative development in the creation and adaptation of OER seems to be the way forward to counter the process of information imperialism. However, this is so, not only because it is important to create more African content, but also because the process itself of creating such content can counter information imperialism by spurring innovation among Africans. As Keats explains:

The production of knowledge might lead to financial transactions, but more importantly, it might also lead to innovation transactions. If for instance I have a book and you buy this book from me, then there is a financial transaction. If I would at the same time be the author of the book, then the innovation transaction is quite close to you as the end user, whereas if I would be only a reseller of the book, the innovation that went into producing that book is lying somewhere else. This is another step back from you, the user. If you are a user of a knowledge resource and if you are actually involved in its creation, then the innovation transactions are actually right there with you. With innovation I mean any process that produces something that didn't exist before. Thus, when things come in from outside with no local creation, then even though their might be no financial transactions in the case of OER, the innovation part of the transaction is still kept by the creators of this product. So, there has to be some local creation if not all the innovation is going to happen somewhere else.

On first sight it appears that the most effective model for such collaborative development is the creation-centred model along the lines of the Rice Connexions project and the in 2006 created Free/Libre and Open Source Software for Education in Africa (FLOSS4Edu) – initiative³⁵. The creation centred model seems to offer the best structure to stimulate collaboration and joint content development among African intellectuals and to forestall Sub-Saharan Africans are consigned to the role of OER consumers, rather than contributors to the expansion of knowledge. However, such a structure can only flourish if African intellectuals and institutions receive incentives to contribute high-quality material to the world-wide body of OER. According to Mackintosh, this is actually the current strategy of the Vancouver based Commonwealth of Learning, which apart from funding the FLOSS4edu project also funds another creation centred OER-project in the developing world, the Virtual University for Small States of the Commonwealth, where 27 small country states with populations of less than four and a half million are working collaboratively developing content online by the small states themselves.

However, it is important to note the difference between creation-centred models of OER and the need for Africans to create OER for themselves. The creation-centred model of OER seems the most adopted and attractive model to create content to due to its low threshold. Nonetheless, this does not mean that content centred – and learner centred models of OER can't be of use to counter the process of information imperialism by creating knowledge. It should be clear that content-centred and learner-centred models of OER or hybrids of them could also be of help, as long as they are adapted or produced by Africans, or in equal partnership with Western institutions, as there is also a need for African Universities to absorb and recreate through linkages with the West the newest technologies in communications, agriculture, engineering, science, mathematics and finance (Hoffman, 1996: 87).

Such knowledge creation and adaptation forms actually a major part of a new strategy of the AVU. The AVU, learning from mistakes in the past, formulated a new strategy which embraces OER. In order to be less dependent on western content and universities, but also not to operate separately from the rest of society, their plan is now to work more closely together with African Universities and stimulate the creation of African content by Africans and to enable Africans to adapt global knowledge to their local needs. Part of their new 'OER

³⁵ http://www.wikieducator.org/FLOSS4Edu#Educational_Content

Architecture' is to set up an OER capacity building centre in Nairobi, together with the Open University United Kingdom. According to Bateman, who is involved in this initiative, creation centred OER could play a role in countering the process of information imperialism, although their success in this all depends on their implementation.

Also the AVU's participation in the TESSA programme (see also paragraph 3.5.2) was initiated with the idea of improving ownership of knowledge by Africans themselves and as such countering the process of Information imperialism. Vincent: "The TESSA program adopts the following philosophy: you don't just take materials, but you take them and improve them, reversion them. If that happens, Africans can become contributors. Therefore the TESSA project creates materials which can be downloaded, adapted and uploaded. If that happens you are going to begin to do away with the problem of information imperialism." However, the TESSA programme is not entirely focused on the creation of knowledge by Africans. It is actually a hybrid form of OER, with learner-centred, content centred and creation centred components. The learner-centred and content-centred components were mainly produced by the Open University UK. Nonetheless, Africans were involved in reworking, adapting and re-contextualizing these materials. In addition, the creation-centred component offers tools for users to adapt, re-contextualize or add extra content. However, there is some content created by the Open University UK which cannot be changed. According to Bateman this was done due to concerns about copyright, quality and pedagogy: "There are some restrictions with regards to certain content which cannot be changed. The re-authoring or adaptation had mainly to do with adding case studies."

So far though, the focus has been mainly on how by producing OER by Africans for Africans themselves the process of information imperialism can be countered. However, there are also opportunities for OER created by Africans to counter information imperialism in the global arena. Bateman argues for instance: "OER produced by Africans could also be of interest to people in the global north, for instance in the areas of African Politics or African Languages". Moreover, Hoffmann points to the potential of African created OER to penetrate global markets in order to respond to the challenge of information imperialism, especially when such efforts are underpinned by nationwide policies which can create comparative advantages vis-à-vis other countries: "In a country like Zambia, they are investing heavily in bio-fuel and renewable energy. If this is something where at the national level countries plan to qualify maybe thousands of engineers in the near future, then suddenly these engineers can develop a

new education service industry and offer trainings and courses about renewable energy and also to people in developed countries. They could in their business model use OER for market penetration and make profits with the service layer put on top of this. This is an opportunity. However, at this stage this is a fictional issue.”

4.3 Brain Drain

4.3.1 The problem

Brain drain is here referred to as the process by which, driven by socio-economic and political push at home and ‘pull’ from abroad, the best minds of developing countries move to the wealthiest nations. Wealthier nations not only have the resources, they also have the knowledge to attract them (Mkandawire, 2005: 17-18). It has been estimated that since 1990 an average of 20,000 highly educated Africans, among them academics, have been migrating to the north every year (Mkandawire, 2005: 209). In the United States this has for instance led to the strange situation that African residents are the best educated people of that country. For instance, in 2000, 94,9 per cent of African born residents aged twenty five and over had completed high school or further education, compared to only 86,6 percent for native born Americans. Moreover, among the African-born residents, 49.3 per cent had a bachelor degree or higher, compared to 25.6 per cent for the native-born population. Hence Zeleza concludes in an ironic manner: “Africa, perhaps the least educated and most underdeveloped continent in the world, has the most educated population in the most developed country.” (Mkandawire, 2005: 223)

It is easy to see how brain drain might be a consequence of failing educational systems and regimes intolerant of independent debate. A deeper cause of brain drain is however the process of information imperialism. This process can not only be explained as a consequence of economics, but at the same time as a process influencing economics, as according to Manuel Castells (2000b: 68-168) economic benefits are awarded to people whether they have or have not access to the global information society, thus prioritizing access to information as a pre-condition to be able to benefit economically from processes of globalization. Moreover, linguistically, the term ‘brain drain’ itself refers to a drainage of the brain and not to a drainage

of commodities, although both are interrelated. So how does information imperialism affect brain drain? There is at least one strong link which can be identified: When talented people are educated according to Western demands, it is easier for the West to hire those people to work for their interests. This is precisely what happened in Africa: many researches and educators from African universities received an education according to western standards. However, these researches and educators had little capacity to work in surrounding communities, but could move to any institution in any industrialised country and serve any privileged community with comparative ease (Mandani, 1993: 1795). Earlier we have seen that most respondents agreed that there is a danger that OER might reinforce the process of information imperialism, and as information imperialism in turn might reinforce the process of brain drain, the following question can be asked:

Is there a danger that OER reinforces the process of brain drain? Can OER also reverse this process?

4.3.2 How OER might reinforce the process of brain drain

In principle a ‘successful’ implementation of OER created by the West could reinforce the process of brain drain by the process of information imperialism: OER created by developing nations for Africans enables those nations to educate African people according to Western demands, what makes it easier for those nations to recruit Africans. One participant of e-learning Africa 2007 voiced during a discussion on OER such a concern: “Western countries dump their educational systems on Africa online. Students might concentrate on open content online, content developed in other countries, with examination in those countries, pass examinations and migrate away for jobs in those countries. It is hypothetical, but also a possibility.” For now this question is indeed hypothetical, first of all because OER created by the West are not ‘successfully’ disseminated in Africa or even in the rest of the world as the movement is still in a rudimentary stage. In addition, OER by itself does not provide people with a degree. Therefore, according to Mackintosh, to assume that OER might reinforce the process of brain drain is not realistic for the simple reason that most people in the developing world wouldn’t be able to pay the tuitions to obtain a degree from Western institutions.

Moreover, even if OER produced in the West would reinforce brain drain, this will be hard to prove: the above described hypothesis already uses two causal links: OER created by the West might reinforce information imperialism and information might reinforce brain drain, thus OER might reinforce brain drain. In addition, not only information imperialism, but also brain drain are influenced by many factors and are complexly intertwined. This also adds to the difficulty to prove a causal relationship between OER and brain drain. According to Bateman for instance, African education systems are already so much incorporated into the Western paradigm that is hard to establish a link between the problem of brain and OER. Nonetheless, the logic that in principle OER created by the West, if consumed by Africans, might facilitate the process to educate Africans according to Western needs and thus reinforce the process of brain drain is also hard to deny and could become a real possibility. And as brain drain is such a huge problem in Africa, it can't hurt to develop policies to counter this possible outcome, or to turn the logic around by examining in what ways OER could also alleviate brain drain.

4.3.3 How OER might alleviate brain drain

If OER created by the West might reinforce brain drain through the process information imperialism, it logically follows that OER created by Africans might alleviate brain drain by countering information imperialism. Therefore, any undertaking of OER which will counter the process of information imperialism might hypothetically also alleviate brain drain. According to Selinger, this could for instance work by the following rationale: "If Africans create good quality content which is relevant to the African context, then people won't need to travel overseas. One student overseas can support 400 or 500 students. If you educate people who stay in the country, they can help to grow the economy, set up businesses, making a more effective government and private sector. This is however a long term vision." In addition, the borderless nature of OER does not only assist in the penetration of Western OER into Africa, it also offers also new opportunities for the creation of OER by Africans from Diaspora communities: due to new information and communication technologies, people living on different continents can collaborate together in the development of OER without the need to physically move. This makes it not only easier to establish partnerships between African developers of OER and developers from the West in order to build capacity in OER-development. It also opens up possibilities to give African scholars living abroad in the West a mitigating role in the establishment of such partnerships.

Thus, the borderless nature of OER, it might not only lead to brain drain, it might also be used as an opportunity to counter this process. Many respondents agreed. Selinger asserts for instance: “A lot of OER resources are going to need a lot of work in order to make them usable in Africa and this should be done by Africans with both an education in the North and an education in the South. They can translate between the two to help conceptualise it for Africans”. However, Africans living abroad can not only help in translating Western content to the African context, they can also create open educational resources for Africa. Mackintosh agrees: “We must also think of the huge opportunities that exist for the Diaspora to actually assist in creating locally relevant content. They are a huge resource that we can hope to tap and build on to produce locally relevant free content for the developing world.” Also Hoffmann sees possibilities: “The support from the Diaspora should not be underestimated. To my knowledge there is support from the Diaspora from the USA for countries like Ethiopia is much more powerful than international development community is investing in Ethiopia.” However, in the end African scholars living in Africa should be also be included, as African scholars abroad might have lost touch with African realities. Tucker: “you need local people as well, as they might loose touch with their roots.” Nevertheless, it is sure worth to look further into the question to what extend African scholars living abroad could play a role in the creation of African OER and while doing this might even be encouraged to return back to their homelands.

4.4 Lack of access for disadvantaged groups to education and knowledge

4.4.1 The problem

To foster a productive academic climate, it is of course very important that a large share of the population has access to quality tertiary education. Unfortunately this is generally not the case Africa. For instance, in 2000, more then 200 million adults were illiterate (33 percent of the adult population) and only 3.3 percent of 18 to 25 old had the chance to enrol for tertiary level education (Commonwealth of Learning, 2000: 43). And with a mean enrolment rate of only two percent, Africa has the lowest rate of university enrolment in the world. (Hoffmann, 1996: 84) Moreover, this two percent mainly consists of students from privileged groups, leaving out

disadvantaged, such as rural groups not associated with ruling parties. Females are also seriously underrepresented in African universities (Commonwealth of Learning, 2000: 43). Thus, one of the biggest challenges facing knowledge dissemination in Africa is providing access to learners who will never have the opportunity of studying at a tertiary education institution. Mackintosh explained for instance in paragraph 3.5.2 how tertiary education will be unable to service reasonable participation rates. Similarly, Marquard argues: “There is definitely an argument that formal education systems are not going to be able to meet all of the educational demands in Africa. There is a similar situation in India. Numbers of children in India are so big, that even if you build schools, there would still be more children that cannot be in schools.” Thus it is interesting to think about the following question:

How can OER improve access for disadvantaged groups to education and knowledge?

4.4.2 Challenges for OER to improve access for disadvantaged groups to education and knowledge

As has already been reiterated many times, one of the major challenges posed to OER has to do with issues of technological access³⁶ and the socio-cultural appropriateness of technology. This challenge is of course especially big for reaching traditionally disadvantaged groups, such as for instance women or poor populations living in slums and rural areas, as D’Antoni explains: “OER requires access to costly equipment and connectivity, which especially disadvantaged groups usually lack, and it requires a certain high level of skills to be able to search, find and use what might be useful to you.” Chapter seven will examine these challenges further under the headings technological appropriateness and cultural appropriateness (see paragraph 7.2 and 7.3). As already said in paragraph 1.1, this thesis aim is not to focus too much on technology itself, but more on the socio-cultural contexts surrounding this. One of the socio-economical challenges posed by this lack of accessibility is of course that the position of disadvantaged groups will only weaken by OER, as only the elite of society will be able to use them. Thus, the

³⁶ In Africa, including the better connected northern parts and South Africa, 90 percent of the population does not have access to a phone, and 98.5 percent does not have Internet access. In addition, 77 % of Africans lack access to electricity. Moreover, those electricity-power grids who do exist in Africa often suffer from brownouts, voltage surges that can damage digital equipment, and often provide only a few hours of power per day. Moreover, the cost (in absolute terms) of Internet access is in Sub-Saharan Africa often as much as ten times that of Europe. In addition, internet access does not exist at all in most rural areas, where usually over half of the population lives (See Atkins, Brown & Hammond, 2007:).

knowledge gap within African countries might actually increase due to OER. On the other hand, one can wonder to what extent this problem is OER specific, as the wealthier people will anyways have the wealth and the opportunities to become better educated than the rest of society, whether they have to pay to access educational resources or not.

4.4.3 Opportunities for OER to improve access for disadvantaged groups to education and knowledge

Nonetheless, if the issue of access can be solved, suddenly great possibilities arise to for OER to increase educational access to normally excluded groups. Casserly argues for instance: “A lot people can’t attend higher education because there are no opportunities for them. OER can be used to fill that gap.” However, not all respondents are convinced that OER can do this, although most agreed that OER in general can improve access to information and also under certain condition for disadvantaged groups. In addition, some emphasize the specific relevance of OER for this purpose through its suitability for life-long and informal learning (see paragraph) and that also possibilities for OER created and used outside university settings should be examined. Negash argues for instance: “Academic institutions are not the only ones that can make use of OERs. Private groups, NGOs, all of those are participants. So how can OER be made useful beyond the academic world. How can OERs be made useful for others?” Similarly, Mackintosh reasons: “We got to think very carefully how we can widen access to education as a common good for society. So I think the problem is far greater then just reducing overcrowded universities. We got to think very carefully how we can widen access to education as a common good for society” According to Mackintosh, this is also one of the strategies of the Commonwealth of Learning: “We are building OER through the research experience we gained from distance education in order to increase access of disadvantaged groups to education and knowledge”

Lessons learned from distance education can indeed be a valuable source of inspiration to create learner-centred OER reaching out to disadvantaged groups. Not only because of similar strengths and opportunities as discussed in relation to overcrowded universities (see paragraph 3.2), but also because specific opportunities of e-learning to reach out to disadvantaged populations also apply to learner-centred OER. In line with Saints, learner centred OER can reach out to four normally excluded groups (Saint, 1999: 3-4): 1) Secondary School graduates

who fail to gain admission to university (considering the small intake in most African countries) 2) Women with household responsibilities 3) Learners in remote rural areas, small towns or refugee camps who do not have convenient access to tertiary institutions and 4) Impoverished or socially marginalized communities.

However, also similar weaknesses and threats for learner centred OER as discussed in relation to overcrowding apply (see also paragraph 3.4.3). Moreover, one can question whether learner-centred models of OER really will reach out to the above described groups, as according to D'Antoni many e-learning institutions, such as for instance the Open University United Kingdom, failed in achieving this goal: "If I go back to my early years when I worked for the Open University United Kingdom, it would be the concept of OU that one had most interest in to reach the most disadvantaged groups. As you probably know quite well, the British Open University was set up for that reason. However it did not reach those people, perhaps it is better now. I am not an expert on this, but I think that the OER movement is unfortunately in the same difficult situation". Nonetheless, if implemented well, the above described reservations do not take away the huge potential for learner-centred OER to service excluded groups. However, more research examining how to unlock this potential though is needed, especially as the task of providing education in a more equitable way is enormous.

Conclusion

Challenges

The OER movement is mainly led by the Western world. There is a credible threat that OER will reinforce the process of information imperialism and becomes nothing more than a new neo-imperialistic instrument to exploit the unequal balance in knowledge dissemination between the West and the developing world. There is a danger that Africans will be consigned to the role of consumers of OER instead of producers. In addition, the dumping of educational products created in oversaturated western markets in unsaturated African markets might induce Africans to use western knowledge of poor quality and of little interest to African needs. Nonetheless, OER by themselves don't force people to use them or outstrip Africans from the possibility to create their own OER. Another threat posed by OER is that as it might be used as a tool to educate Africans according to Western needs, OER might stimulate the process of

brain drain. Nonetheless, as long as OER are not yet widely used in Africa, it is hard to find evidence for this argument. In addition, although learner centred OER produced in the West are accessible for free, they don't result in Western degrees without paying tuition fees. These fees will remain too high for many Africans and as such not undermine the need for African degrees. Nevertheless, it is important to take into account the possibility that OER might reinforce brain drain. Another challenge posed by OER is that it will only increase the gap between African elites and disadvantaged groups, as only an elite group with access to the internet will be able to profit from OER.

Opportunities

On the other hand, learner centred models of OER could be used to service these disadvantaged groups, especially for secondary school graduates who fail to gain admission to a university, women with household responsibilities and learners in remote areas. Nonetheless, such educational efforts will only be effective if the learning materials used are relevant to the local context. In this respect, it might be helpful to include such disadvantaged groups in the development process of OER. Fortunately, there is a rich array of African educational resources just waiting to be transformed into OER. In the process of doing this, information imperialism might also be countered by spurring innovation among Africans. Nonetheless, Africans lack proper infrastructure and resources to enable this process. However, developing countries actually have a comparative advantage over developed countries in producing OER due to lower labour costs. Furthermore, low-budget collaborative creation centred models of OER can be used to circumvent financial barriers. Such a strategy of collaborative development is actually already applied by most OER initiatives in Africa, such as for instance the TESSA programme or FLOSS4edu. In addition, there are also opportunities for Africans to counter the process of information imperialism in the global arena by developing OER and using OER as a market penetration strategy in relation to service industries in which they can develop a comparative advantage. African Diasporas could play a special role in countering information imperialism by helping in the creation and adaptation of OER. As such the problem of brain drain can be circumvented. In addition, the problem of brain drain itself can be alleviated if OER can take away the need for students to study abroad and if OER can help African learners to help grow African economies. This is a long term vision though.

Some concluding remarks

The creation centred model of OER not only seems to be the most appropriate to deal with the in chapter thee discussed practical educational problems inhibiting effective knowledge dissemination in Sub Saharan Africa, its collaborative framework is also conducive to counter to process of information imperialism by stimulating the creation of local content. Moreover, as creation-centred models are conducive to increase the relevance of African education to African needs (see paragraph) they also might offer possibilities to help grow African economies and as such fight brain drain. This argument about relevance can also be extended to disadvantaged groups: the participatory nature of creation centred OER can also stimulate disadvantaged groups to participate in the adaptation or creation of OER and as such tailor OER to their particular educational needs. However, again, just as has been noted in chapter three, this does not necessarily mean that the potential of other models of OER shouldn't be examined to deal with socio-economic problems blocking the diffusion of knowledge in Africa.

Chapter 5: How OER can or can't deal with socio-political problems inhibiting the dissemination of knowledge

5.1 Introduction

Apart from practical educational problems and socio-economic problems, there are also many socio-political issues inhibiting the effective dissemination of knowledge in Sub-Saharan Africa. As the OER movement is also underpinned by ideological motives it is important to put these in perspective in relation to such socio-political issues. In many African countries, there is a still democratic deficit and governments, but also universities are often intolerant to independent debate. This is of course not only lethal to a flourishing academic culture, but also to fostering democratic cultures in society at large. In addition, many African countries are experiencing conflict or are just recuperating from civil war. This also has been a major toll on the free dissemination of knowledge in Sub-Saharan Africa. Moreover, sometimes roots of these conflicts can also be found in African educational systems. Hence, this chapter will, using the same method as the previous one, examine challenges and opportunities for OER in relation to democracy and civil conflict. With respect to the latter, it will be especially investigated how OER might be able to contribute to the establishment of conflict sensitive educational structures.

5.2 Lack of democracy: Regimes intolerant of independent debate

5.2.1 The problem

A major socio-political problem hindering the development of a vibrant African academic community is a lack of autonomous intellectual spaces. As Ki-Zerbo and T. Mkandawire explain: the need of developing new nation states after independence led African intellectuals often to proclaim: "Silence: Development in Progress" (Mkandawire, 2005: 25). Many African universities were not allowed to operate independent from the state. And as these states were often the sole provider of jobs, intellectuals often accepted to close an eye towards the predatory and undemocratic nature of these states. Moreover, many intellectuals even felt the

need to justify the authoritarian rule of their job-provider under the guise of development. However, these attitudes did not only arise out of selfishness or personal greed, as after independence the strengthening of the state was necessary to safeguard the sovereignty of the new states and to give direction to the nation building project (Mkandawire, 2005: 3). Nevertheless, despite the hopes and aspirations many African intellectuals shared to work for a flourishing academic community, in practice the justification of these nation building projects often led to self-censorship, ethnic politics, intolerance and misogyny (Mkandawire, 2005: 9). Moreover, the discourse of anti-imperialism of most governments was often used to divert the attention of African intellectuals away from self-criticism. And those intellectuals who were critical either belonged to ethnic minorities who were systematically excluded from power, or lived in exile, and thus were unlikely to have very much influence on the local politics of their countries (Mkandawire, 2005: 25).

In addition to these problems, the academic freedom in Africa has not only been comprised by African states, but also by international financial institutions and other external interests (Mkandawire, 2005: 1000). However, notwithstanding these problems, by the end of the 80s, African intellectuals have experienced an improvement in academic freedom and intellectual autonomy. African scholar's organizations began to speak up against state's restrictions on the freedom of expression and thus contributed to the wave of democratization which swept through Africa from then on. This new way of thinking led in 1990 to the Kampala Declaration on Academic Freedom, which was adopted at a major conference organized by CODESRIA, an organization devoted to improving the academic freedom of African Intellectuals and stimulating an African renaissance. Thanks to these developments, Mkandawire is for instance able to note that "African intellectuals are much freer today than they have ever been since independence." (Mkandawire, 2005: 43) Nevertheless, with many dictatorial regimes still in place and many Africans still being unable to speak up freely, the problem of the restriction of autonomous intellectual spaces remains still far from solved. Thus the following question is unfortunately still relevant:

Can OER be used in Africa to stimulate democracy and a culture of independent debate?

5.2.2 Challenges for OER in to improve democracy and independent debate

5.2.2.1 *Challenges posed by Governments: the reinforcement thesis*

The first and foremost challenge for OER to improve democracy and independent debate, especially on the societal level has of course again to do with access. Negash explains for instance: “Maybe only one percent, the elite and the middle class, have access. So how could OER democratise?” Similarly, Cappelle argues: “If OER wants to be a democratic force, an important requirement here is providing equal opportunities to all citizens. When it comes to technology oriented approaches this is a very difficult and challenging thing to do.” However, besides this obvious obstacle, there are also many political challenges which will have to be overcome. Undemocratic regimes intolerant of independent debate might for instance pose a serious threat to the democratic ideals underpinning the OER-movement. Knowledge deemed to be a threat to the survival of the regime in power might be made inaccessible, as is for instance the case in China, where many websites which are deemed to be inimical to the state are blocked. Moreover, there is a risk that undemocratic regimes might shape OER to their serve their own interests and to indoctrinate their citizens. This argument is also known as the *reinforcement thesis*, which upholds that technology and knowledge are just tools for the reinforcement of existing power structures. Thus we can expect that OER will only be accepted or maybe even stimulated by authoritarian regimes when this is done in a harmless way which does not threaten this regime (Bellamy & Raab, 1999: 518-534).

Unfortunately, there are many instances in Africa which support the reinforcement thesis. Negash explains for example with respect to Ethiopia: “There is a lot of fear for ICT from the government side. They think ‘if people have access, then it may be a risk to me, they may come after me. Those are unfounded fears which the government is disproportional magnifying. Ethiopia blocks access to certain resources, such as Voice over IP or live video interaction. The government controls everything in Ethiopia. If they don’t want certain OER, they can block it”. Similar stories were told by respondents about many other countries. According to Bateman though, such government control is so inimical to the whole OER movement that filtered OER ceases to be OER: “If governments restrict certain OER materials in order to keep up there regimes then that goes against the philosophy of the movement. Censored and restricted OER are not OER anymore. These governments are not part of the OER movement.” On the other hand, one can wonder to what extend governments would like to restrict OER. Selinger argues for instance that OER won’t be put so much under control, because Africans need educational

resources. Governments, though, are not the only threat to democracy and a climate of independent debate.

5.2.2.2 Challenges posed by information imperialism

Another threat for OER to improve democracy and independent debate might come from OER itself through the process of information imperialism. Uzo argues for instance: “If we define democracy as knowledge by the people and for the people, then the OER movement is in this respect a flop already. Just look at the content from OER. This has all been developed outside of Africa.” Similarly, Casserly reasons: “if it is going to be participatory and democratic it has to a multi-way of exchange and right now it is too much of a one way exchange.” In addition, Omedo wondered whether there is an imperialist agenda behind the whole movement of OER: “Is the OER movement underpinned by an American inclination? Is there a political agenda? For instance, are they trying to forcing a western style of democracy on Africa?”

5.2.2.3 Challenges posed by innovation

Certain pedagogical styles of teaching can also pose a serious challenge. It has for instance been argued by Ogbu and Mihyo (2000: 3-4) that traditionally African education takes a top-down approach and see students as recipients, and not as critical processors of knowledge (see also paragraph..). It is of course obvious that such a pedagogical style is not very conducive to promoting democracy and independent debate. Moreover, teachers who believe in such teaching styles might be reluctant to promote OER, as exposure to them might make their students more critical and sometimes even more knowledgeable than them. In general though, according to Gbenga Sesan, students will become more critical and knowledgeable anyways, with or without OER, as Sesan explains: “Adults have been very slow in acquiring new techniques and the youth have learned fast. They are now dominating 90% of all internet cafes in Africa, giving instructions to adults and their fellow youths.” (Soltane, 2004: 128) This sadly also implies, that if OER would stimulate democracy, older people will be largely excluded from this process. As Omedo explains: “Youth are more computer literate than older people. As such OER could make youth aware of their rights. Older people lack the skills and time to be involved in this.”

5.2.3 Opportunities for OER to improve democracy and independent debate

5.2.3.1 *Technological opportunities*

As demonstrated, some respondents supported the reinforcement thesis and this is in line with most research on the topic of ICT and democratization. Nonetheless, there are also scholars who disagree with this pessimistic view and argue that the technology of internet itself promotes democracy, because its horizontal structure of communication is inherently democratic. Arguments similar to those made by these proponents of the democratic force of the internet can also be applied to OER: even if authoritarian regimes would try to filter information from OER they would have technical difficulties in doing so. Moreover, OER can be anonymously accessed, which reduces the importance of gender, sexuality, ethnicity and class in social interaction. In addition, interactive OER can create horizontal instead of vertical flows of information (Pianmo, 2002). If this way of thinking is correct, then this would imply that the improvement ICT-Infrastructures and new tools, software and technologies which can empower individuals to use and create OER, will work in itself as a democratic force. Omedo seems to support this thesis: “Kenyans are critical, because they have access to information. Improvement of communication improves democratic procedures. The technological configuration of OER might play a role in this” Nonetheless, one can wonder though, to what extent democratic reform through new technologies have anything to do with OER. Cappelle argues for instance that the potential for democratic reform lies not in OER per se but in new democratic / participatory models brought about by new technologies. According to Cappelle, Digg is a good example of this:

Digg is one of the most popular websites in the world, where all news content is voted to the front page by Digg users. Even user comments on articles can be voted up or down. The Digg system itself is constantly changing based on what the users want – there are regular discussions on how it could be improved and ideas are voted up and down. The system has its flaws, but it has definitely created a new democratic model of sharing news, exchanging views, bringing out a diversity of perspectives etc. which is very successful. Such a model could be applied in other ways, and already we can see with the emergence of Web 2.0 that the Internet is becoming much more participatory and democratic. I believe there are many lessons to be learned here and that such participatory/democratic technologies should not just be limited to such things as news and entertainment websites

Nevertheless, if ‘such participatory/democratic technologies’ are extended to the level of education; these technologies can also become specifically related to OER. This is for instance the case with the Wiki-environment. Mackintosh explains: “The Wiki environment is the best expression of democracy we have in today’s world. By its very nature it can lead to democratization through an educational angle but at the same time the actually process of developing free content in an open and democratic way is by itself democratization”

The ‘technology-promotes-democracy’ -argument, though, is not the only argument which can be brought against the pessimistic view of the reinforcement thesis. One could also counter this by using the reinforcement thesis itself. This time though, not by focusing on the level of governments, but by applying it on the level of the individual. Selinger emphasises for instance how individuals are likely to use new technologies for their own private interests: “OER cannot reduce democracy. They can only improve democracy. Restrictions will go away. States can’t control it. In South Africa people use Skype, while it is not allowed. The telephone was invented by people to listen to concerts but now we use it for something different. People empower! People will get access to this stuff and will find ways to communicate. The mobile phone was invented to phone, but people sms all the time.”

5.2.3.2 Ideological opportunities

In addition, apart from focusing on individual users, one can also focus on the content of OER to promote democracy by for instance 1) utilizing OER to promote democratic ideals (content-centred), 2) making the voices of citizens heard by enabling them to participate in the creation of OER (creation-centred) or 3) teaching citizens democratic skills (learner or centred).

Vincent comments for instance with regards to the latter: “There are some programs in South Africa that are specifically tailored to how to train people how to vote and run elections and there are no reasons why the materials for these programs shouldn’t be freely available.”

However, according to Bateman, if such OER would be developed by the West, there could be a caveat: “Whose style and form and notion of democracy are we promoting? The western content, the movement could be exploited to promote particular styles of democracy that might be alien and inappropriate to African circumstances.”

The strongest argument of OER in relation to democracy stems however from the fact that the ideology behind the OER movement itself can be seen as a democratic force. The Hewlett Foundation for example notes about its OER-sponsorship: “The plan is intended to be a

strategic international development initiative to expand people's substantive freedoms through the removal of 'unfreedoms': poverty, limited economic opportunity, inadequate education and access to knowledge, deficient health care and oppression." (Atkins, Browns & Hammond, 2007: 1) In addition to the freedom of oppression, and the other mentioned freedoms which are necessary in order to make democracy work, the ideology to bring freely ones work and activities into the open also improves in principle transparency and accountability, also important assets for democracy. When a professor for instance puts all his work or lectures Online, it will be a lot clearer what he is doing. Moreover, many universities in Africa are publicly funded by taxpayer's money. To lock learning resources behind passwords is then not only inefficient, as people in other publicly funded institutions might sometimes duplicate work and reinvent the wheel (Hylén & others, 2007: 64), but also inappropriate, as these resources basically belong to everyone. By making them freely accessible, taxpayers can find out what happened with their money.

Nonetheless, Hoffmann warns that OER cannot create a more democratic education on its own. This all depends on the whether people want this to happen, although there are some elements which could allow to educate students in a more democratic manner: "Educating people in a more democratic manner may be easier with OER because of the participatory nature of some OER or because of the fact that openly sharing knowledge might increase transparency. Nonetheless, it all depends on the willingness and openness of those who would like this development to take place. So it is not an inbuilt mechanism."

This also partly explains why for a number of OER advocates argue that some forms of OER are not helpful in promoting democratic learning cultures at all, and especially those OER that cannot be altered instantly by users, such as for instance MIT OpenCourseWare. Tucker reasons for example: "Open doesn't hold the connotation where the real value lies. The real value lies in the freedom of the communities that are using those resources to build, modify, adapt, localise, re-contextualise and ultimately build their own." In a similar vein, Mackintosh deplores the democratic deficit of OER that use closed models of development: "There are a number of closed models of development; a good example would be connexions from Rice University. The outputs are openly available for adaptation and modification and they do use a free content licence, but the production model is essentially closed, so it is closed to whatever group is working on its content. That is not democratic."

To some extent this point seems hard to deny. On the other hand, most of the people who make this argument have been part of the Open Source Software movement, where the ability to access and adapt the source code of software is of the utmost importance. Without this ability, programmers cannot understand, learn and improve software programs. This is less important for OER, especially for OER that are largely text based: the fact that you for instance cannot alter the text of certain scientific articles doesn't have to hinder the possibility of independent academic debate at all. Usually academics keep such debates alive, by responding with their own writings on articles written by others, and not by changing the wording of other people's work. Nonetheless, it is evident that the more open, flexible, adaptable the creation of OER is, the more inherently democratic OER become and that especially the community based and participatory approach of OER can raise hopes for improving political and democratic participation among African citizens.

5.3 Civil conflict

5.3.1 The problem

With at least six countries in Sub Saharan Africa currently being in a situation of armed conflict or civil strife; nineteen countries faced with severe political crises and turbulence³⁷; and still many other African countries still recuperating from conflicts in the past, it is not hard to imagine that civil wars and other types of conflict had and continue to have a disastrous effect on the state of knowledge dissemination in Africa. These negative impacts of conflict on progress in Africa are actually a growing concern of scholars, as Vincent explains: "There is a growing concern amongst development writers about the influence of war. The biggest inhibitor to progress in Africa, including progress in knowledge dissemination, is conflict and its aftermath." Even if Universities continue to operate, there is often a decrease in enrolment and attendance rates. Furthermore, educational facilities frequently become military targets during violent conflicts and as a result educational infrastructures are often destroyed. In for instance Somalia, the war (which now rages again) almost totally destroyed the nation's textbooks and curricula. Moreover, the socially disadvantaged are the ones most likely to be hit

³⁷ See the report "*The Politics of Conflict in Africa*" prepared by the conflict group for the course at University of Amsterdam 'Abandoning Development', lectured by Kwame Nimako,, which can be requested from the author of this thesis (jorrit.mulder@student.uva.nl)

the hardest in times of conflict. Thus conflicts contribute to the knowledge-gap between better-off and disadvantaged groups within African states (Seitz, 2004: 28). In addition, conflicts also contribute to brain drain, as many scholars and intellectuals facing violence and repression often leave or are forced to leave their homelands as refugees. Hence the following question is important:

How can OER be used as a tool to prevent civil conflicts?

5.3.2 Challenges for OER in relation to civil conflict

5.3.2.1 *Introduction*

First of all, it is important to note that once a country plunged into civil war, this will not only pose a serious threat to all social activities in a country, but also to the operation of OER itself. A great challenge to the operation of OER is for instance the danger that ICT-equipment and infrastructure, if present at all, might be destroyed or appropriated during conflicts and that people might join the fight or might be more concerned about their own survival than about accessing OER or simply be forced to flee the country. The focus here though, is on conflict prevention and conflict transformation and not so much on conflict containment and reducing the impact of conflicts, although some possible roles OER could play in response to conflicts themselves will be briefly discussed in paragraph w323. In order to develop strategies aimed at conflict prevention and peace building, it is first of all to understand the roots of conflict. Various approaches emphasize the importance of different roots.

5.3.2.2 *Various perspectives on how OER might plant seeds of conflict*

The peace researcher Schirch (2005: 33) identifies three different approaches explaining the roots of conflict: One perspective, which she has coined the material/rational approach, upholds for instance the view that competing interests over an issue or scarce resources cause conflict. 2) Another perspective, the so called 'social approach' explains conflict as a result of ineffective communication patterns, an imbalance of power, and/or unequal social structures. 3) In addition, Schirch identifies the so called symbolic and cultural approach which views conflict as a result of clashing values, perceptions or worldviews. Seen from the first two perspectives, then OER might lead to conflict by increasing the gap between the haves and the have-nots: only elites are likely to have access to computers and will thus be able to profit from

possible benefits of OER. In addition, OER enhances communication within certain elite groups that can afford computer access, while excluding communication with others outside of this elite circle. These processes might in turn lead to a clash of values and ideologies, as emphasised by the cultural and symbolic approach, an approach we will now turn to.

5.3.2.3 Ideological challenges

Just as according to the reinforcement theory technologies are used by those in power to serve their own interests, so might OER be used by different competing political groups in a way that might aggravate conflict. Lynn Davies (2004) of the University of Birmingham argues for instance, building on Kenneth D. Bush' and Diana Saltarrelli's (2000) now seminal article 'the two faces of education in ethnic conflict' that educational systems can contribute to conflict by: 1) Reproducing or producing socio-economic disparities and the aggravation of social exclusion, 2) Conveying an authoritarian, "hegemonic" concept of masculinity and 3) the development of an "essentialist" identity and nationalistic citizenship concepts, which deny the cultural plurality and promote intolerance towards 'the other'. In principle, OER could be used to reinforce such mechanisms, due to the fact that competing factions might be able to control who gets access to what kind of 'freely accessible' information.

5.3.2.4 Challenges posed by innovation

In addition, the fact that OER might contribute to development, democratization and a pluralisation of values, can in itself be seen as a source of conflict. The German peace researcher Dieter Sengaas (1998) argues for instance: "Development is inevitably conflictual, destabilizing and subversive because it challenges the established power structures that prevent individuals and groups from reaching their full potential. Uzo agrees and provides an example of this on the family level: "New technologies can be a source of conflict. For instance, My Space allows kids to tell anyone whatever they want to say. It gives them a voice. However, in Nigeria there is an unwritten rule that whatever happens to the family, you keep it to the family. However, they share their problems with their buddies and not with their families and are given wrong advice, so you get conflict in the living room. I can imagine that similar conflicts could happen with OER. For example, OER created by someone who doesn't know anything about local cultures might enrage those people." Similarly, Bateman argues: "It might lead to intellectual conflict. There will be and are people who are already dubious of their students being able to access knowledge resources that open sources provide, and they find this very challenging." However, Sengaas also describes how such conflicts can act as a catalyst

for progress, as long as long as the situation is managed in such a way that people don't become violent. Family quarrels and intellectual conflicts belong of course to the level of the individual and not to the macro-socio level of civil conflicts. Nonetheless, according to a large body of literature about conflict management, there are many parallels which can be drawn between these two different levels of analysis.

5.3.3 Opportunities for OER in relation to civil conflict

5.3.3.1 How from a material/rational perspective OER have an advantage over other resources

What opportunities are for OER in relation to conflict prevention and peace-building depends just like the challenges on the roots which are sought to be addressed, which in turn depends on the perspective one has on conflicts. For those who explain conflicts from a rational/material approach as fights over resources, there is at least one quality inherent in OER which is especially worth mentioning. Marquard explains: "Resources that cannot be reproduced are sources of conflict. A major strength of digital OER is that they can be reproduced indefinitely at no extra cost. Conflict is more an issue when you provide concrete resources which need finance. The access-medium, rather than OER itself might then be a source of conflict." If one upholds the 'fighting over resources' – view, this seems plausible. However, there could still be conflicts because of OER-spoilers. Bateman argues for instance: "There is always a risk that some share resources while others don't. This could lead to conflict too."

5.3.3.2 How from a social perspective OER might enhance communication

OER are not only static resources, they can also be seen as dynamic tools which are used within a certain social setting. For those who explain conflict as a result of ineffective communication patterns, OER could for instance also contribute to stability by enhancing communication and as such be used for the purpose of dialogical conflict resolution. The aim of dialogical conflict resolution is to open channels of communication in order to overcome prejudice and misunderstanding to build trust (Ramsbotham, Woodhouse & Miall, 2005: 288). OER might be used to do just that. Selinger argues for instance: "The Rwanda genocide happened due to a lack of communication: It started with one radio station telling everybody to go and kill their neighbours. If there were three radio stations, the situation would have been different. Everybody in Rwanda is convinced of that. When people only hear the information provided by one radio station, then that becomes the truth. The more you communicate with

people, the less likely you want to kill them. It is only because you don't understand somebody. OER is all about exchanging ideas freely and openly. Therefore OER can in principle enhance such communication." Similarly, Negash emphasises the potential of OER to increase understanding between peoples: "I personally believe that if people have access to more sources of information, people will be more aware and this will reduce conflict. Others might disagree. It may start as something negative, as it will strengthen opposition, but at some point people will go beyond that as the access to information will become an equalizing force and OER can play a role in this. Moreover, conflicts have often only a few leaders with maybe two, three or at the most twenty groups involved. Those groups can be reached by reaching their leaders. OER specifically tailored to conflict management and enhancing communication between those leaders might thus have a positive impact on conflicts."

5.3.3.3 How from a symbolic or cultural perspective OER can be used to promote conflict sensitive educational structures

As said, those who explain the roots of conflict by differences in ideology, culture or identity concepts, might argue that OER can be abused to serve the interest of war mongering parties. Nonetheless, if underpinned by a conflict sensitive ideology, OER, following a similar rationale, might also contribute to building more stable societies. An expert on the relation between education and conflict, the German peace researcher Seitz, offers such an ideology. Seitz (2004:10) makes the following recommendations to make educational structures in this respect more conflict-sensitive:

- 1) Promote inclusive and integrative educational facilities which i.e. allows for equal access for all population groups, and also reflect the social and cultural diversity of society in the curriculum.
- 2) Promote a democratic and participatory learning culture so as to allow for a constructive way of dealing with conflicts, and at the same time be embedded in a democratic educational environment which allows all the societal powers to participate in shaping the education system accordingly.
- 3) Take into account the plurality of human societies to a greater degree and allow for the development of multiple and inclusive identity concepts, which appreciate differences and heterogeneity and which are able to encounter foreignness with tolerance and empathy

The first proposition fits neatly with the OER movement's aim to promote equal access of knowledge to everybody (see for instance quote by Hewlett Foundation, paragraph 5.2.3.2). Nonetheless, this depends of course all on who has access to these resources and as said in paragraph 5.3.2.2, there is a danger that OER will only be accessed by the elite. Furthermore, Seitz second proposition, that educational facilities should practice a democratic and participatory learning culture, again is also something envisioned by many OER-proponents, and especially those promoting the creation-centred model of OER. Moreover, Seitz third recommendation, that educational facilities should promote multiple and inclusive identity concepts, which appreciate differences and heterogeneity and which are able to encounter foreignness with tolerance and empathy is also congruent with the ideology of many OER advocates.

Bateman agrees: "These propositions are very much in line with what the philosophy of the OER movement potentially can introduce into society. It is a little idealistic at the moment, but it is something that we should be striving towards. One of the things of course about having multiple sources of knowledge available with people, who are sharing that knowledge freely and openly with each other, is just that you start to appreciate the differences and the fact that

we are not a homogeneous mass.” Nonetheless, according to Keats, these propositions only work for those who are already predisposed not to be finding themselves in a situation of conflict: “If people are predisposed to fight with one another they will find something to fight over. They will even fight with one another over whether one approach is better than another, so I think it requires a certain buy-in in the way of thinking of OER, of collaboration and all of those sorts of principles. I don’t know whether participating in OER project is necessarily going to engender those kinds of ideas. You are more likely to participate in an OER type of project if you are already predisposed to those sorts of ideas, so I am just a bit weary of making a cause and effect.”³⁸

However, notwithstanding this reservation, Keats agrees that if people have the willingness, OER can be used to adopt Seitz recommendations, as long the right production model is used. He argues that his so called ‘mana-from-heaven’-model (content centred OER produced in the West) should be avoided in favour of his so called ‘communal farming’ model (democratic and participatory creation-centred OER): “Whether OER could contribute to the creation of such conflict sensitive education systems depends on whether you are talking about the ‘mana-from-heaven’ model or about collaborative creation. The latter model would be more conducive to adopt these recommendations, because already you have to find ways to compromise, otherwise you cannot collaborate. Already you start to develop a mindset that recognizes that you can’t always get your own way and that’s OK. There should be a high level of penetration though, before it can have an impact at the kind of level that you are talking about.”

5.3.3.4 Opportunities to use OER as a tool in response to civil conflict

Apart from the above described more structural opportunities to prevent the outbreak of new conflicts, OER could also be used as a tool to alleviate the effects inflicted by conflict itself. OER could for instance be applied as a resource in peace building programs. In addition, OER might also be used in refugee camps to ensure that refugees can continue their education. Especially the borderless nature of OER offers opportunities for refugees but also internally displaced persons to continue their learning efforts. Moreover, this same borderless nature of OER can also be used to ensure that libraries become less vulnerable, as backups of their books and journals can be stored in a digitized form on servers outside the country. Such a measure

³⁸ A similar argument was made by Hoffmann in paragraph 333, but then with respect to the capability of OER to promote democracy.

could have for instance prevented that Somali schools now lack the necessary information to teach their children. Vincent agrees: “OER might have a better chance of survival during conflicts, as it is less dependent on a physical institution.” Similarly, Marquard reasons: “OER might make it easier to people to continue getting access to educational opportunities in a conflict situation, particularly where conflicts in a society is disrupting formal school education, transport or other destabilizations that might make it impossible to go to school or to universities”. Also Hoffmann argues, though with some hesitations, that there might be a role for OER to ensure more continuity in access to educational materials, though not only in situations of conflict, but in general: “In many SSA countries you are dealing with risky environments, and if educational resources will be available for teachers and learners then it will automatically have a positive impact. But the positive impact is on continuity and that things are available. If OER can do that, then that is already a lot”

Conclusion

Challenges

Teachers might perceive OER, and especially participatory models of OER in which students have prominent role as a threat. The innovation brought by OER might challenge the traditional top down-approach of many African educational systems, in which students are seen as recipients and not as critical processors of knowledge. As such, this can be seen as an intellectual source of conflict. Nonetheless, this is not so much OER specific, but a characteristic of a generation gap. African youth are actually in the vanguard of development of ICT and are likely to become more critical anyways of older generations. Apart from such challenges on the teaching level, the process of information imperialism also poses a challenge to the democratic nature of OER itself, if one defines democracy as a participatory and a multi-directional exchange of ideas by the people and for the people.

OER though might not only plant seeds of intellectual conflict, which can actually sometimes be transformed into a constructive process of change; OER might also contribute to real violence. According to the material approach and the social approach this could happen, because only elites with access to OER can benefit from OER. As such, OER might increase the gap between the haves and the have-nots. Moreover, according to the reinforcement theory,

OER will only be used by governments if that is in their own interests and as long as they don't pose a threat to their rule. Governments can in principle block access to certain OER and manipulate others. Thus, OER may be used to indoctrinate citizen. Moreover, censored and adapted as such, they could also become a source of conflict. Especially when such OER would reproduce socio-economic disparities, impose an authoritarian way of thinking and develop 'essentialist' identity and nationalistic citizenship concepts.

Opportunities

Nonetheless, seen from the material approach, OER themselves detached from its hardware won't be sources of conflict, as they can be reproduced at no extra cost indefinitely. Furthermore, from the social perspective OER might enhance communication and as such reduce conflict. Moreover, OER related technologies might counter the reinforcement thesis by promoting democracy through their properties: they enable OER to be anonymously accessed, while creation-centred OER enable horizontal instead of vertical flows of information. In addition, the reinforcement theory might be debugged by applying the theory itself on the level of the individual: individuals will also use technologies in their own interests, and according to some, governments are less and less able to control these technologies. However, not only the technologies related to OER, but also OER itself can be used to promote democracy and stability. For instance by utilizing OER as a tool in peace building programs or to promote democratic ideals, enable learners to voice their opinions and teach citizens democratic skills. In addition, the borderless nature of OER can be used to ensure some sense of continuity in risky environments.

The most compelling argument though, why OER has to potential to promote democracy and less conflict ridden societies comes from the ideology behind the OER. There are differences of opinion though within the movement to what extent people should have the freedom to change OER produced by others. Especially some OER advocates promoting democratic, participatory learning cultures with creation centred OER deplore the undemocratic nature of closed models of production. However, on the whole, the philosophy behind OER seems conducive to democracy, and moreover, in line with recommendations given by the German peace researcher Seitz, for the creation of conflict sensitive educational structures. Moreover, the ideology of openness behind the OER movement also seems to promote transparency. Nonetheless, whether OER can actually promote these recommendations to reduce conflict or

whether OER will really be used to promote democracy all depends on the willingness of people to do so

Some concluding remarks

The previous chapters demonstrated that the creation centred OER seem to be not only the most appropriate to deal with the educational discussed inhibiting an effective dissemination of knowledge in Africa but also with information imperialism and some aspects of brain drain and servicing disadvantaged groups. Creation centred OER though, also seem to be the most appropriate in order to promote democratic learning cultures and conflict sensitive educational structures, especially as they promote in line with Seitz second recommendation democratic and participatory learning cultures. Nonetheless the other two propositions of Seitz, i.e. to create inclusive and integrative educational facilities and to take into account the plurality of human societies, can also be promoted by other models of OER and other models of OER can also be used to promote for instance democratic ideals and skills. Thus again, as already has been concluded in chapter three and four: one model of OER doesn't necessarily exclude another.

Chapter 6: Global challenges for the implementation of OER in relation to Sub Saharan Africa

6.1 Introduction

In the preceding chapters, the focus was on how OER might alleviate or worsen knowledge dissemination in Sub Saharan Africa. Naturally, sometimes issues related to the implementation of OER itself popped up. Most of the times, these were mainly treated as side issues. The following two chapters, though, will focus specifically on such issues. This chapter will cover some of the most important problems OER advocates are facing globally with regards to implementing OER projects, such as intellectual property rights, sustainability, quality assurance and institutional challenges. These general obstacles though, will be discussed in view of the African context. The next chapter will deal with issues of implementation that are more African specific, such as cultural appropriateness, technological appropriateness, conflict sensitiveness and lack of ownership.

6.2 Intellectual Property Rights

6.2.1 Introduction

As already briefly touched upon in 3.2.5, current intellectual property regimes pose globally a major threat to the ideology of OER itself, as Casserly explains: “The intellectual property issue is the largest issue. If OER proponents’ willingness to give knowledge away for free collapses and they start to lock up content again, the whole philosophy of OER collapses as well.” Some OER advocates argue even more vehemently against the current status quo. Tucker opposes for instance even the concept of Intellectual Property Rights itself: “Never use the term IPR again, because it is misleading. It is a term that people, who have a vested interest in the whole IPR regime that is in place now, would like you to use. It reinforces their incorrect model of the whole thing. If I take something of your property, you no longer have it, and I have it now. That does not apply for artefacts that can be freely shared on the internet. We can reproduce them infinitely and you still will have your own copy. Copyright law needs to

change. We don't need such long terms of protections anymore." According to Tucker, Intellectual Property regimes are based on a flawed logic: "Knowledge is inherently free. What I say to you in words, you can interpret when you hear those words. What is knowledge in my head becomes knowledge in your head. You might interpret this differently, because you might integrate it in a different system of concepts. Nonetheless, these concepts are most of times are also based on other peoples' knowledge. However, the moment you write down some knowledge and capture it on an audio, and you make it explicit knowledge in some way, then we have a problem in terms of the fact that people can make copies of that." Moreover, Tucker argues that it is a fallacy to think that people invent for the money: "Most inventions didn't come because people were paid. Maybe in some industries and in some cases that is the case, but I don't think we should have a blank intellectual property regime that covers everything. If we look at free and open source software, most of it was not generated in order to make money or a return on investment and yet the quality and what has come out of that process is as good as proprietary software that is out there." Nonetheless, it is not correct to assume OER advocates like Tucker, who focus on the freedom to use and adapt knowledge, are against making money with knowledge. They actually endorse people to make money by offering services which use knowledge, as long as the generated knowledge itself remains freely accessible and adaptable for everyone

6.2.2 Pragmatic challenges

So far, the threat posed by current intellectual property regimes to the philosophy and ideology of OER has been discussed. Many OER advocates, though, combine ideology with a more pragmatic, interest based view. Marquard argues for example, that a lot of people hang on to materials because they believe they have a commercial value while they actually don't and that thus these materials should be freely shared. In addition, the argument can be made that authors and universities don't profit much from the current intellectual property regimes, as profits go for the largest part to commercial publishers. Moreover, publishers often slow down the speed of publishing, as they constitute an extra chain in the whole publishing process. Nonetheless, most OER advocates don't want to get rid of the concept intellectual property rights itself, like for instance Tucker pleaded for. Many of them see actually the lack of awareness about these rights among scholars as one of the major barriers to an effective implementation of OER. Research has for instance shown that many academics are willing to share their work, but often

fail to do so out of fear to lose the rights of their work (Hylén & others, 2007: 82). This fear is unjustified According to many OER advocates. They emphasize that there are many tools available which enable scholars to freely share their work without losing their rights, like for instance the in paragraph 3.2.4 and 3.3.4 briefly touched upon Creative Commons Licenses³⁹ or other similar licensing procedures. Nonetheless, such licensing can be quite burdensome and the difficulties and costs related such copyrights clearances can be considerable: before publishing educational resources that make use of third-party materials on the internet, the author, or the publisher must ensure that they have the right to use these materials (Hylén & others, 2007). Such practical issues can course also pose a major threat to the implementation of OER.

6.2.3 Challenges posed by the non-commercial and no-derivate-works-allowed restrictions

Another challenge posed to OER by intellectual property regimes originates from OER themselves that use a non-commercial restriction or a no-derivate-works-allowed restriction. These restrictions can for instance be added under a creative commons license⁴⁰. Many advocates of creation centred OER argue against the no-derivative works allowed restriction. This restriction prohibits by definition the adaptation and recreation of OER and should therefore, when possible, be avoided as this will make it hard to adapt OER to local African contexts. However, as will become clear, similar arguments can be made about the non-commercial restriction. Many authors add a non-commercial restriction to OER out of fear by the author that free available content will be sold commercially by others. According to many OER advocates, also this fear is unjustified. However, one could ask: how does the non-commercial restriction impede the effective implementation of OER? Well, 1) first of all because it adds to the already mentioned difficulties and confusions that arise during the licensing process: in many instances it is for example not clear what counts and what doesn't count as commercial. 2) In addition, the non-commercial clause might make OER incompatible with materials that use other licenses. This is particularly so for materials which require derivate works to be licensed under the same conditions as the original work. Thus, the non-commercial restriction will make it more difficult to adapt or recreate OER according to the African context. 3) Moreover, the non-commercial restriction is seen by some OER-

³⁹ For a more detailed explanation about creative common licenses see appendix G

⁴⁰ For an explanation of these licenses, see appendix G

proponents, and especially by OER advocates who focus on the freedom to use and adapt knowledge, as restricting freedom in a hypocrite way. Mackintosh argues for instance: “MIT doesn’t want anybody to make money, what is ludicrous. On the one hand, academia say, we don’t want people to make money, but at the same time these academia are writing textbooks and handing over copyrights to commercial publishers, so that publisher can make money and then students pay for the content. This is like saying: we believe in freedom of speech as long as people don’t make money out of it.” In addition, the non-commercial restriction can also be a hindrance to the sustainability of OER projects (see also paragraph 6.3.7).

6.3 Sustainability

6.3.1 Sustainability of producer-consumer versus co-producer models of production

Sustainability poses not only a major threat to many development projects undertaken in Africa. It is also one of the most important issues the OER movement is facing all over the world. Sustainability of an OER project can be defined as a project’s ongoing ability to meet its goals. Thus, they must find a way to sustain the production and sharing of OER and sustain the use and reuse of their OER by their end users (Hylén, 2007: 90). The former requirement can only be accomplished if there is a sustainable costs recovery model. The latter requirement can be fulfilled if the OER project produces productive outcomes in accordance with its goals.

Whether the production and sharing of OER is sustainable in terms of resources that are needed, is first of all dependent on the production model that OER. One of the few authors on the sustainability of OER, Stephen Downs (2006), makes for instance just like Keats a distinction between 1) the producer-consumer production model, where producers and consumers of knowledge are separated from each other⁴¹ and 2) the co-producer model in which consumers of OER may be producers these resources at the same time.⁴² According to Downs, the producer-consumer model is more likely to be managed centrally and involve professional staff and offers more control over quality and content, but requires high levels of funding. On the other hand, he argues that the co-production model is more likely to depend on

⁴¹ This model was referred to by Keats in paragraph 5.3.3.3 as the mana-from-heaven approach

⁴² This model was referred to by Keats in paragraph 5.3.3.3 as the communal-farming approach

decentralised management, may involve numerous partnerships, may involve volunteer contributors and there is little control over quality and content. Downes reasons that such approaches require less funding.

Thus, on first sight, it appears that the co-production model is the most viable model for initiating OER projects. However even the co-production model still requires some sort of funding. Cappelle explains for instance with respect to wikipedia, which uses of co-production model: “Wikipedia runs on volunteers and just needs funding to pay for the bandwidth. However, bandwidth costs alone can be considerable and especially in Sub-Saharan Africa, so OER can never be entirely free.” Thus, even by using the most voluntary, collaborative model of OER, the question of funding cannot be avoided. The latest OECD report on OER (Hylén & others, 2007: 93-94) has identified six different costs and revenue models Based on Dholakia’s (2006) and Downes’ (2006) work. Due to lack of space and for reasons of clarity, here a less comprehensive classification will be used to illuminate some possibilities for funding OER initiatives. These possibilities are structured around three categories that are sometimes a combination or adaptation of the categories put forward in the OECD report. It is important to note though, that it different strategies can of course be combined.

6.3.2 Funding by replacement

One of the models for funding OER initiatives is the so called replacement model (Downes, 2006). In this model, open content replaces another model and can benefit from the cost savings resulting from the replacement. Unfortunately, though, this model has a natural limit, since you can only replace so much. Many respondents cited the cost-effectiveness of OER in relation to other publishing models. Marquard reasons for instance: “Reducing publication costs is important. Universities make textbooks but pay publishers. It might be more economic if they pay scholars and to create and publish their own learning materials and to release them as OER. Then commercial publishing agencies could be left out of the process. However, it will take a long time to change this pattern, and universities will see it as an extra cost.” In addition, Negash stresses how the reusability of OER can make them cost-effective: “OER are important because once created, and updated they can be reused over and over again. That

makes them cost effective.” Also Mackintosh believes that OER might increase cost-effectiveness and especially so for the development of e-learning materials⁴³: “The value proposition lies in radically reducing the costs of the education system. The greatest costs in developing any educational materials lies in the time academics need to develop those materials. For distance teaching institutions, that actually represents 80 percent of their total costs. So if we as institutions start sharing those costs, we are in a far more sustainable position.” Moreover, Mackintosh argues that replacement of the current model is not only possible, but also needed. Not only in relation to the sustainability of OER projects themselves, but also in relation to the whole world: “There are some governments that pay authors for the delivery of textbooks for the school curriculum and I see no reason why these authors shouldn’t be paid to deliver free content under a free content license. In this way we would be able to achieve sustainability of the initiative and maximizing the potential of mass collaboration across our planet.” Nonetheless, according to Cappelle, the costs of OER might be still too high in many educational settings to be cost-effective, due to its expensive technological and material requirements. Therefore he argues that it has to become easier and more affordable to 1) access OER and 2) produce OER.

6.3.3 Public funding

Another possible way to finance OER projects is provided by the public funding model⁴⁴. Here, the funding for operations is provided by public institutions, which can either be donors, governments or educational institutions. In this respect, donors seem to be the least reliable, even though many OER projects up to now, like for instance those initiated by the Hewlett Foundation, have been donor-led. The problems posed by donor-funded projects to sustainability are well known. D’Antoni explains for instance: “The most important thing is that donors’ support is not going to last forever. What happens when there’s no donors’ money anymore?” This is a question which according to Wright is not seriously enough taken into account by many development projects: “As Dr. Kenneth Keirstead said during the closing

⁴³ Mackintosh actually confirms with this statement the argument made in paragraph 3.4.2 about how creating learner centered OER collaboratively might reduce their production costs

⁴⁴ This model can be seen as a combination of the in the OECD report listed donation or endowment model, voluntary support model and contributor pays model (Hylén, 2007: 93-94)

plenary of eLearning Africa: perhaps educators in some countries have come to expect external funding will always be there. Thus, from my point of view, they don't think of developing local self-reliant projects.” Similarly, Negash argues: “Donors cannot make OER sustainable.

Donors can play a role in starting up OER projects though. Some help is needed. In the long term that donor funding is going to stop” Downes (2006) also reasons that donor support can be used to start up OER project, but will most likely not be viable in the long run. Nonetheless, he argues that this support could be transferred to a government-support model and that this can be a long term option in some countries.

In Africa, a long term sustainable model which makes use of such a transfer could hypothetically work for instance in the following way: educational institutions could ask help from donors to start OER projects with the aim of educating more people in accordance to the needs of African economies. Then, in ten years there might be enough educated people who start up small business and make money with their enterprises, but not with their knowledge. Part of this profit will go back into taxes, so a wider tax base might develop. This tax base can then be used by governments to pay for further development of OER. The problem with this hypothetical model, though, is that it is built on many assumptions which only can be fulfilled in a best-case scenario. One can question for instance whether OER really can contribute to educating Africans according to the needs of African economies. And if so; it is doubtful whether Africans will stay, due to processes of brain drain. This makes it also doubtful whether OER can contribute to creating a larger tax base. For now though, the reality is that such a tax-base doesn't exist and is not likely to exist in the near future. Thus, some respondents argued that the corporate sector should pay more taxes to enable governments to fund OER projects. Molakku reasons for instance: In Kenya, more then 50 percent of the people lives below the poverty line. For them a capitalistic model will not work. The corporate sector should ship in and the government could use corporate tax to disseminate such a model. There is no wide tax base. The middle class already pay high taxes and they get very little in return for this. Therefore, corporations should be targeted.”

6.3.4 Funding by a ‘knowledge for free and services for profit model’

In the replacement model and the public funding model both seem to assume that OER projects themselves cannot generate revenue. However, this doesn't necessarily have to be the case, although this might be true for many OER-projects. The most sustainable model for funding OER projects is of course when these projects can be funded out of their own revenue. But how is it possible to generate income when you provide all educational materials you generate for free? Well, the most by respondents cited way of doing this is by using what I call the ‘knowledge for free-services for profit model’⁴⁵. Selinger explains for instance: “It is not resources that help students, but the teaching. You can sell the teaching services, but not the content.” Similarly, Vincent, speaking on behalf of the Open University United Kingdom argues: “Open resources aren't always free resources. We can supply the learning materials free, but then African universities could charge students to support them in using those materials and a different model might grow up.”

Also Cappelle envisions a model in which profits made in the West on services can be used to finance OER-projects. On top of this, he argues that these profits can not only be used to finance OER projects, but also to finance services connected to these projects in the developed world: “OER needs a commercial model, if only to pay for those who cannot afford access to OER. High quality OER can be produced for free, and successful models such as Wikipedia also require that access remains free. However, those who can afford it could pay a bit of money for extra conveniences – for example, leave it free on the web but pay a monthly (per view) fee for getting the information on their cell phone. The profits made with such ventures can be used to provide access to OER for those who cannot afford it, for example, in developing countries information could be requested through mobile phones free of charges.” In addition, they might also be used to increase market penetration. Hoffmann explains: “OER can be used for market penetration. If there is put on top of the OER a service layer, then it can certainly be a balanced business model for those who provide the services. Many professors are afraid of giving their intellectual capital for free but if they can offer services on top of this they

⁴⁵ This model can be seen as a combination if the segmentation model and the conversion model listed in the OECD report (Hylén, 2007)

might not be so afraid anymore. In addition, you can also release a certain part of the information as part of a strategy to gain more clients.”

6.3.4 Recuperation of costs model

In addition to the ‘knowledge for free and services’ for profit model, it is also possible to come up with a compromise between the ideology of the OER-movement and traditional intellectual property regimes by using for example the what I call a ‘recuperation of costs’-model. In this model, educational resources are used to make profit until the costs of producing them are recuperated. After this, they can be released as OER. Uzo argues for instance: “You also want to get money for product you invested in. After having recuperated your money then you can release it.” Similarly, Tucker reasons, though from a more global perspective: “It ends where you get your return on your investment. On the other hand, you get super capitalism where a company produces some prose, gets its return on investment but thinks we can sell this over and over again and they get paid over and over again for doing nothing. This is not sustainable. This leads to huge communities of lawyers, accountants, and all the rest building there livelihoods around a pattern of worth which is not connected to any material value. But all of those people have to eat and they all have an environmental footprint trough their cars and they are polluting their environment and sooner or later the whole system is going to crash because of that. On a global level we need to realize in the final analysis that we are all one community of a planet which rapidly is running out of resources. And if we don’t look to ourselves as all belonging to one community and that this planet belongs to everyone, then we are looking for trouble. OER will help address that problem. There may be some ups and downs, but that is a necessary part of the process.”

Nonetheless, there are some serious shortcomings attached to the recuperation-of-costs model. First of all, it is unclear when producers of knowledge consider their costs to be recuperated. Moreover, there is a danger that under this model, only outdated materials will be released as OER. In addition, the recuperation-of costs model still clings to the idea that knowledge itself can be sold as a commercial product. Nonetheless, in some cases this model, which can be seen as a compromise between open and closed content, could still create some benefits.

6.3.6 Is the private sector a likely partner for developing OER?

Nonetheless, in response, Traxler wonders whether it is at all possible to recuperate costs, so let alone finance OER projects, especially in relation to the development of e-learning materials:

“There are not very many, if any, models of content development that are commercially sustainable; there are individual companies who got a bit of a trick of it, not that many. This is worrying. There is not a sound economic basis for private sector work; not in the United Kingdom nor in Africa.” On the other hand, Traxler doesn’t dismiss the importance of the private sector. He actually thinks that their involvement will be advantageous for the implementation of OER. He only questions whether the private sector will be interested.

Besides this reservation though, one could also question whether company involvement is not even more unreliable than depending on for instance donors. This question is especially relevant in relation to companies that have a short term strategy geared towards making immediate profits and decide on the fate projects on the basis of immediate market forces.

However, according to Hoffmann, many companies operate on the basis of a long term vision, as a short term strategy of money-grabbing often goes against their interests: “Eat and run for companies doesn’t work, so frequently they will develop more long term strategies; not always, but it happens frequently. That is why they might be reliable partners in keeping OER available.”

6.3.7 How the non-commercial restriction undermines sustainability

The non-commercial clause which is often added to OER will not only make it more difficult to recreate and adapt OER, but also to make OER-projects sustainable. First of all, it is easy to see that the discussed ‘knowledge for free and services for profit model’ cannot work under such a commercial restriction. This model by itself breaks with this restriction by making profits with providing services based on OER. Moreover, the non-commercial restriction can also pose problems under any other funding model in which the private sector is involved. Hoffmann argues for instance: “OER must be freely available for commercial benefits. If companies would invest in OER, they invest money, so they want to make something out of it and they

need to eat.” Likewise, Casserly reasons: “The non-commercial restriction hinders sustainability. You can’t for instance put such content on a website that has advertising, nor can you add value to it.” This was one of the reasons why the TESSA project got rid of the non-commercial clause. According to Bateman, now it is possible to set up commercial enterprises based on TESSA resources. Nonetheless, he comes with a warning: “There will be cases where a non-commercial restriction might be appropriate, but that would be very rare and people should consider such cases very carefully before they apply it.”

6.3.8 Sustainability in terms of accomplishing goals

As noted by the OECD report, sustainability not only comprises the ability to continue a project, but also the ability of a project to accomplish its goals (Hylén, 2007:90). Whether an OER project can accomplish its goals depends of course on the goals and the implementation of a project. Hoffmann provides an example of how an OER-project, by using a ‘replacement model’ of funding, might accomplish a policy-goal of many African governments and that by this accomplishment alone such a project could be called sustainable: “Governments in developing countries lack resources. There are almost no books, there are almost no libraries. So from their point of view it can mean that if OER increase the outreach of educational resources this is already a success and a kind of national business model. The mere fact that these resources are available would already be a sustainable model.”

6.4 Quality assurance

6.4.1 Producer-consumer versus co-production models of quality assurance

Another issue the OER movement has to face all over the world is how to assure the quality of the educational resources that are made available. The process of how that can be done depends again on the type of production model of OER that is used. As has already been put forward in paragraph 6.3.1, according to Downes (2006) producer-consumer models offer more control over quality than more informal co-production models. Opinions differ though on whether

tighter control over quality also will lead to better materials. Some argue that in the first place, well established institutions are necessary to assure quality, while others have a more community based approach, arguing that the more inclusive, participatory and widespread the reviewing process of educational resources, the higher the quality of these resources will be. Mackintosh propagates for instance the latter approach:

What determines quality? Wiki as a technology does not prevent peer reviews by experts. When we were growing up as kids at schools, we were taught: don't believe everything you read in the newspapers. It's a life skill which you need to acquire. How do you validate and accept certain information? I don't see how Wikipedia would be any different from that. Similarly, when you look at the research of peer reviewed articles, you will find that the average academic article has been peer reviewed by no more than two people. How do we achieve quality when only two people have reviewed something against a model in which over thousands of people are reviewing? Interesting in this respect is the outcome of a research-article which compared the quality of scientific articles of Wikipedia with those of the Encyclopaedia Britannica. Both were found to contain an equal amount of mistakes, with the major difference that Wikipedia could correct them once the article was published.

Nonetheless, not everybody is convinced that quality can be assured by such community based approaches. Vincent reasons for instance: "If you would have a site where any number of people could deposit material, then you would have a real problem with quality. I don't think that improving the materials by peer reviewing would be sufficient in this case. You would have to have that site managed in some way by somebody." Similarly, Gerals Rawasanga, a speaker from Rwanda on OER argued at e-Learning Africa 2007: "Many individuals are putting their materials online, thus we should be able to choose the good resources. Well known institutions are needed to assure the quality of those resources."

6.4.2 Quality control by using systems of filtering

In paragraph 2.2.3, it was noted that as a response to such quality assurance concerns, the Rice connexions creation-centred model developed a system of lenses. This is a technology which allows third parties to review materials according to their own quality standards and which

enables users to choose to view materials based on such reviews. Such filtering technologies could allow for the both institutional and community based approaches to quality assurance. However, Mackintosh doubts whether such models are scalable⁴⁶. Moreover, he criticises the Rice-connexions model itself, because although their filtering system allows various third parties to review content, the quality-assurance mechanisms these third parties use are closed to outsiders and as such do not contribute to more participatory and inclusive reviewing processes. In addition, he doubts whether the high level of sophistication of the filtering technology used by Rice-Connexions is really needed: “Quality is not determined by the technology. That is a misrepresentation and an assumption that is in the mind of many folk that are playing around with these technologies. They are sure that one technology provides a lot of better quality than another technology and that is utter nonsense.”

Also Vincent wonders whether quality assurance mechanisms as used by rice-connections can reach economies of scale in developing countries. However, in contrast with Mackintosh and coming from the producer-consumer side of the spectrum, he emphasises that the quality of educational materials needs to be assured by education specialists and specialised institutions and not so much by the end-users. Vincent argues that especially creating high quality learner-centred OER requires high level specialized skills: “You need to provide structured learning and not merely diluting them by just dumping information into these countries. Then it won’t help enough. With structured learning I mean pedagogically structured learning where some people have thought through how people will learn. There is a difference between having materials and going actually through a learning process with learning outcomes and the one does not automatically lead to the other. You have to think of how people will learn and how you can enable them to learn. That is a different and specialized task.”

6.4.3 Quality assurance and information imperialism

According to Hoffmann though, the quality standards used by Western education specialists might be different from those needed in an African context “If we use the term quality, we may measure it with quality standards we are used to have here in Europe. This is actually not

⁴⁶ Nonetheless, one of the projects Mackintosh is involved in, the commonwealth of learning EduCommons project, aims to adopt a similar filtering model as used by Rice Connexions

required to my experience.” In addition, he is also like Vincent weary of the fact that the West might dump poor quality materials in developing nations, but by reasoning that oversaturated markets in developing nations might dump low quality materials on unsaturated markets in developing nations (see also paragraph 4.4.2). This brings us again to problem of information imperialism and specifically to need to develop systems of quality assurance which can counter this process. The most important thing in this respect is of course that such quality assurance systems of OER (produced in the developed or developing world) emanate from African users and producers of OER, whether on the community or on the institutional level.

6.5 Institutional and organizational challenges

6.5.1 Introduction

Another often cited problem regarding the implementation of OER has to do with institutional and organization challenges. Moore argues for instance that some of the main obstacles to initiate OER-projects are organisation, coordination and political will and funding, not lack of expertise or overall financial resources or skills. (Moore, 2002). The difficulty and slowness of creating institutional change can be added to this. Hoffmann explains for example: “There is a lack of awareness how much effort it costs to trigger institutional or educational change processes.” According to Hoffmann though, organization, coordination and political are more important than funding: “lack of funding and resources is of course a major issue but it is actually not the most relevant issue. Much more relevant in practice is poor management, poor governance, and waste of resources and things like that. If you just give money and sponsor the development, I can assure you that nothing will come out of it. It is much more complex” In addition, he insists that training people only makes sense when this is embedded in a wider institutional policy framework: “It is not only training the teachers, it is much more comprehensive. It also has to do with institutional attitudes. To train people doesn’t mean that something really changes in practice.”

6.5.2 Need for a structure of incentives

According to many OER-advocates, such an institutional policy framework should include a reward system for teachers and researchers to devote time and energy to develop OER. Teachers and researchers are often overwhelmed with work and thus will probably only contribute to OER when they are rewarded for this or see this as part of their daily job. Cappelle agrees: “What is required is a management structure in which the creation of contents is rewarded.” Similarly, also Hoffmann thinks that a structure of incentives should be put in place, where teachers and researchers are paid to create OER or expected to do so as a part of their job. According to Casserly though, there is only one university in the world that has such a policy. Surprisingly, this is an African university, the University of Western Cape Town, with their Free Open Courseware policy (See appendix C), as Casserly explains: “They have the first policy in the world that I know of that reward faculty for creating OER. That is part of the incentives and policy structures that need to be in place to move things forward. Thus, it seems to be still a long way until such management structures will be a common practice.”

6.5.3 Need for institutional, nation – and African wide and international policy frameworks

Management structures conducive to the implementation of OER though, can only be put in place though by African universities themselves and need to be backed by governments and preferably in cooperation with fellow African countries. Omedo agrees: “There is a need for institutional, nation and African wide policies. African governments with ministers of education should all be brought on board to mobilize the required interests. Governments can make financial commitments, find the right development partners and design policies conducive to OER.” Similarly, Hoffmann argues with respect to the national level: “OER might improve the quality of education if embedded in a wider policy framework. There needs to be a process of change in the education sector. In order to make this happen, nationwide policies dealing with OER must be established.” In addition, Mackintosh calls for more cooperation between African governments, and especially between Francophone and Anglophone Africa: “I would like to see more collaboration between Francophone Africa and Anglophone Africa around the OER movement. There are a lot of things that we can share in

terms of infrastructure, processes and alike. In some respects Francophone Africa's support and infrastructure on open source software is more developed than in Anglophone Africa. On the other side I see initiatives in Anglophone Africa that are moving ahead without the engagement of francophone Africa." In addition, also cooperation on the international level is needed. UNESCO's International Institute for Educational Planning is actually already playing a facilitating role in this with their OER forum community which according to D'Antoni consists for sixteen percent of members from Sub Saharan Africa.

6.5.4 Need for evidence that the concepts works

In order to move things forward on the policy level, one of the most important things is to proof to governments, universities and possible development partners that the concept of OER works: without proof of the viability of the concept it wouldn't make sense to invest in OER projects. According to Hoffmann, such proof needs to be established by practice: "You must be a genius if you want to be successful in Africa. If you are not a genius things will not work out. However, if you implement a project and you use OER and more importantly, things work out in practice and people can see the immediate benefits, then the movement will start. So proof of the concept is needed." Another route to provide more proof can be by conducting more research, what is also needed. According to Marquard, it could be for instance beneficial to conduct research to explore what educational materials are produced by African universities and to what extend they would be willing to share this. Moreover, according to Vincent, more research is needed to find out how OER can be used by African universities in a way that is in own their interests and not threatens their existence: "You have to make sure that the economies, business models that those universities have, won't be adversely affected by OER. If there is an African university who is run by selling its books to fee paying students you need to be careful with promoting OER. There is no point OER across Africa with bankrupting the same universities." These are only just two of the many things that have to be examined in this early stage of the movement. A lot more research and pilot projects will be needed before enough proof can be provided to really be able to inform people thoroughly enough on the policy level about the possibilities of OER.

6.5.5 Awareness raising and capacity building

To move things forward, it is also important to engage in awareness raising and capacity building. According to D'Antoni awareness raising was ranked as the most important and capacity development as the second most important priority issue for Sub Saharan Africa by UNESCO's OER community. This outcome is not surprising though, as these issues are very important to kick-start the movement. OER-networks should be established to make people aware of the concept and to give them the skills to implement and create OER. In addition, such networks are also needed to lobby for change on the policy level. Moreover, once such networks become more developed, it will also be easier to attract funding for OER projects. According to Bateman, such awareness raising will start on the university level: "It is most likely that the OER movement will be first constructed in the higher education sector. The higher education sector will take the lead as it does with many fields in Africa. The higher education sector in Africa has taken the lead in for instance economic development, social development, medicine but also education. A lot of those things are not yet substantially supported by the private sector, as they are in other parts of the world." Similarly, Tucker argues with respect to the FLOSS4edu initiative that they should focus on awareness raising and capacity building on the university level: "If they can get some actual things done in universities, then that is the most positive thing they can do." Nonetheless, universities are not the only possible actors for awareness raising and capacity building. Many respondents though, are weary of the fact that many universities in Africa are out of touch with their surrounding communities and argue that the private sector should also be included. A good example of a private initiative which can be tapped from as a resource for capacity building is tactually the by Hoffmann designed Comprehensive Package for Building eLearning Organizations, a comprehensive commercial eLearning capacity building-programme, which is based on and promotes the use of open source platforms and open content license models⁴⁷

⁴⁷ http://www.hoffmann-reif.com/e3025/e677/index_eng.html

6.5.6 Finding champions

According to many respondents, one part of process of awareness raising and capacity building involves identifying champions. Negash explains for instance: “There are enough technical people, but to have a champion at the management level that would actually take this and actually implement it in the peoples skills, soft skills, to pull that technical expertise so that is disseminated and it actually being used, that is where the challenges are.” Similarly, Tucker reasons: “The implementation of OER initiatives will depend on who is championing such initiatives within a university. Thus, in Africa we need to emphasize that a lot more and work on finding the champions within the institutions who have a passion for their field and to encourage them to create open educational resources and use those as flagship projects to demonstrate the value within the institutions and from there it can influence the institutional level as well.” Also the Hewlett Foundation is interested in finding champions and especially champions with access to networks that can induce change on the policy level. Cathy Casserly from the Hewlett Foundation stated for instance: “Africans are overwhelmed with so many educational issues. We need to find strong African champions who can really promote it and really believe in it and that they can try to move forward. It is kind of finding that network. The AVU had a network of eighteen partner institutions it was working with. I think a kind of revamp and restructuring of the project will begin to identify who they are and who can fulfill that role.” Similarly, also D’Antoni indicated that UNESCO’s OER community is interested in finding champions who can take the concept of OER further in Africa and adds that she prefers the word ‘champion’ over the word ‘leadership’: “We need champions at all levels. I think it’s a very nice term, as it refers to a role and not to a position of power, as the word ‘leadership’ might do.”

6.6 Conclusion

All over the world, OER-projects are dependant for a successful implementation on dealing with issues such as intellectual property rights, sustainability, quality assurance, and institutional or organizational challenges. In Africa this is not much different, although some of these issues might be more difficult to deal with. Regarding intellectual property rights,

especially the non-commercial restriction and the no-derivate-works allowed restriction which is often added to OER, pose an extra challenge. Both restrictions inhibit the reuse and adaptation of OER, while the former blocks much needed involvement of the private sector. Thus promoting the use of open licenses without the non-commercial or no-derivate-works-allowed restrictions is mission critical, although sometimes these restrictions cannot be avoided. Also sustainability of OER projects is an issue that OER projects face all over the world. However, sustainability is even more a concern for Sub Saharan Africa where many development projects are donor-led and often cease to exist, once the flow of donor money stops. Therefore, in the first place it is important to look into ways to make OER projects as cost-effective as possible. In this respect, creation-centered models are likely to be cheaper than producer-consumer models due to their collaborative nature. Nonetheless, even the most cost-effective models of OER still need funding.

Four cost-recovery models were identified. In the first model, the replacement model, cost-effectiveness of OER can be achieved due to the fact that OER can be copied and reused indefinitely. Nonetheless, the replacement model has a natural limit, as you can only replace so much. It is important to note with respect to the second model, the public funding model that donors might be necessary in the start up phase. However this is only likely to be successful if Africans and not donors take the lead in this. In addition, even though many governments have little resources, it will be of the utmost importance to receive government support to make the transfer from less sustainable donor funding to more sustainable government funding. Governments might buy into the idea of OER if they think such an approach can help them in achieving their goals in a cost-effective way. As such it is of the utmost importance that OER also achieve the goals they aim to reach. The best cost-recovery though, seems to be the third 'knowledge for free-services for profit model' in which OER-projects could become self-sufficient by making profits with services on top of free accessible content. This model, though, can only be applied in relation to OER without non-commercial restrictions. Another commercial model which might work is the fourth 'recuperation of costs' - model. However, there are some serious problems in terms of practicality, quality and ideology attached to this model which can be seen as a compromise between open content and closed content.

With regards to quality assurance, there is a debate going on between the use of producer-consumer models and co-production models of quality assurance. Producer-consumer models offer more control but are likely to be more expensive than co-producer models. Thus, in terms

of costs, again a creation-centered model of quality assurance seems to be preferable. A compromise between these two models might be reached by employing filtering technologies such as for instance used by the Rice Connexions project. It is doubtful though, whether the use of such complicated technologies will be scalable in Sub Saharan Africa. However, regardless of the model used, the most important thing is that quality assurance mechanisms (not only for African content but also for Western content) that might be used in Africa emanate also from Africa. This is especially important to deal with the problem of information imperialism. Many institutional and organization challenges though, also need to be overcome, as OER projects are only likely to be implemented successfully if implemented in a wider institutional, nation and African wide and international policy framework. Such a framework should include a structure of incentives for teachers and academics to create OER. In the short term though, the most important thing though is to affect policy change by establishing an OER-network to raise awareness and build capacity around the concept of OER. Moreover, it is important to establish some tangible proof for governments and educational institutions that the concept works. Therefore, champions are needed on all levels to start up OER projects and move the process forward.

Chapter 7: African specific challenges for the implementation of OER

7.1 Introduction

The previous chapter deal with some global issues affecting the implementation of OER-projects. This chapter will deal with more African specific factors which have to be taken into account in implementing OER, such as cultural appropriateness, technological appropriateness, conflict sensitiveness and ownership. Many of the observations made in this chapter though, are generalisations of issues that by their very definition cannot be generalised. It is for instance impossible to generalise about what should be considered to be cultural appropriate in any situation. Thus, if this chapter makes generalizations, what is unavoidable, these should be interpreted with some flexibility. On the whole though, this chapter is actually a plea for avoiding generalizations and to stimulate local ownership of OER projects, as this can help in finding local culturally, technologically and conflict sensitive solutions to problems that may arise.

7.2 Cultural appropriateness

7.2 1 Axiom for relevance

In general management terms, cultural appropriateness is of course all over the world important for the successful implementation of any project. However, this issue is of extra importance for the implementation of OER in Sub Saharan Africa. The OER movement was mainly conceptualized in the developed world. Thus, there is not only the danger that OER will be irrelevant to African educational needs (see paragraph 3.6) or that OER will reinforce the process of information imperialism (see paragraph 4.2). There is also the threat that the concept of OER might be culturally inappropriate or that OER projects might be implemented in a culturally inappropriate way. Marquard wonders for instance what happens when content is

moved out of a specific teaching environment and de-contextualised in some way. He argues that in this respect, the following obvious axiom for relevance applies:

The further away you are from the place where the material has been developed and is being used, the less relevant it is

Distance can in this respect not only understood geographically, but also socially and culturally. In addition, cultural distance also depends on the subject of teaching. Marquard explains for instance: “There might be a difference between disciplines. Mathematics is very universal, although syllabi might be constructed differently, while in sociology, courses might be very contextual or rooted in a different intellectual tradition that might be prevalent in African universities and not elsewhere.” Moreover, cultural appropriateness also depends on the level of and type of education. Universities for instance, are embedded in different cultures of learning than for instance elementary schools; while vocational training also demands different approaches. In addition, cultural appropriateness also depends on the target-group of OER. For instance: whether the aim is to reach out to rural communities or to service cosmopolitan populations. As has been argued before, the creation-centred model of OER seems to be the most appropriate to deal to enhance relevance of education to African needs, democratic education, conflict sensitiveness and sustainability and to counter the process of information imperialism. In addition, as a consequence of the axiom for relevance, the creation-centred model of OER also seems to be the most suitable to deal to make OER more culturally appropriate to the African context. And again, learner- and content centred OER can be suitable too, as long as long as they are developed or adapted by Africans themselves.

7.2.2 African cultural roots

One factor which can be seen as a part of what defines culture is the influence of cultural roots. It is obvious that for a successful culturally appropriate implementation of OER it is important to understand such roots. Although it is always unsatisfying to make generalizations about cultures and especially about a region as culturally diverse as Sub Saharan Africa, respondents pointed to some African cultural dispositions relevant to education which are more prevalent in Sub-Saharan Africa than in the West. First of all, many argued that in Africa there is more an oral tradition than in the West and that this should be incorporated into OER. Tucker explains

for instance: “Many African cultures learn from generation to generation knowledge which has been transmitted orally. With OER you can do that. You can use audio.” Similarly, Selinger argues: “Africa has a very strong oral culture. If you watch people at the conference, they don’t read power point slides, but they listen to you. There needs to be an African pedagogical approach.” Also informing though, especially with regards to the viability of the concept of OER, is an observation made by Tucker. According to Tucker, African cultures had like most cultures before the industrialized a culture of sharing, which has been corrupted by colonial powers: “The root cultural ethos in Africa like in many other cultures was very much like sharing knowledge, certainly within a community. It’s been corrupted by the colonial education systems. We need to develop a more natural way of sharing of knowledge which is going back to the way it was originally.” Also Negash points to the potential of OER, due to the communal nature of many societies in Africa: “In the West, information is used by individuals make money for themselves. You as an individual have to be innovative. In Africa there is in at least in most of the countries a communal society, in which people use and share information to the benefit of their communities.”

7.2.3 Teaching styles

Differences in teaching styles, is also to a much cited issue. Some of the elements of African teaching styles might stem from the specifically oral African culture. Hoffmann explains for instance: “Africans sometimes use a more enthusiastic presentation mode then Europeans, although this varies of course among individuals and contexts.” A more cited issue though, which has to do with the in paragraph 5.2.1 discussed lack of independent debate, is the more hierarchical, authoritarian style of teaching in many African educational systems. According to Tucker this teaching style has its roots in Africa’s colonial past: “The colonizers have come in and they have instigated the talk and chalk, say it on the stage type of pedagogy with all the kids in the front and hiding their works from their neighbours, so they can’t copy it and it is made to be sinful to look at what the other person is doing.” Also Hoffmann explains these teachings styles as remnants of old-fashioned western models from a different age: “While implementing training programs in Africa, I’m facing these old-fashioned western style educational systems frequently, let’s say from the 50s or even earlier, whereas here in the developed countries the education system is much more participatory. There is a danger that African education might not be able to catch up with these developments and might not be able

to benefit from OER at this moment in time. For instance, the instructional model of participatory OER is totally different from that in which teachers provide all the instructions. If you join a classroom in for instance Zimbabwe or Zambia, then the teachers mostly stay in front of the class and dictate. They are an authority which cannot be criticised.” Similarly, Traxler reasons in relation to participatory ‘social constructivist’ models of learning: “To what extent is what we are doing in West Europe encapsulate a certain set of preoccupations about pedagogy ‘about social constructivism for instance, that really don’t make sense or anyone excited in Africa?’”

This leads to the following paradox: although the creation centred model of OER might in theory be the best model to increase cultural appropriateness, in practice it might be the least accepted model, especially by old-school teachers: they might feel more attracted by content-centred and learner centred OER in which their authority cannot be questioned, of course on the condition that they would feel attracted to use more technology in their teaching anyways. Notwithstanding the possible cultural frictions in the short run though, the creation centred model still seems to be the most constructive in the long run , when one’s ideal is a more democratic, participatory and stable society. And this is not only an ideal of the West, but aspired by many Africans. Democratization though, can in principle not be forced upon anyone, but has to driven by people themselves. Nonetheless, if there is a role for the West in promoting more democratic and participatory teaching styles, then, according to Vincent, this should be done by opening a process of dialogue and negotiation between the West and Sub Saharan Africa: “There are cultures of learning in those countries which are more passive, more hierarchical than those now practised in the West and you have to negotiate with those cultures rather than just simply bypass them. You have to encourage people to become active and critical learners, and not just passive recipients.”

7.2.4 Generation gap

As said, many African long for change and especially young people are going to play a role in this. In paragraph 2.2.3 creation centred models of OER were coined ‘new generation’ OER and paragraph 5.3.2.4 pointed to a conflict between younger and older generations posed by innovation. There, it was discussed that also in Africa young people access the internet much more frequently than older people are usually more computer literate. Hence, these youth might

be a challenge to the authority of the teacher. Thus, it is also most likely that not only democratization, but also pedagogical change will be induced by this new generation. Nonetheless, this of course depends all on how widespread the use of the internet will become. In the West, the internet has been so pervasive that this has become a major factor in creating a generation gap. D'Antoni explains for example: "Young people have grown up with many electronic gadgets and are perfectly comfortable with them unlike people of my age. Teachers are cut in the middle right now, those that are at a certain age come from a different system. Some of them will become adapted and some of them will become afraid. People don't like to feel less knowledgeable than their pupils. At this moment in time, youngsters coming from well equipped societies will be more competent in finding information than teachers. Nonetheless, children often lack the competence in knowing how to read out and use and structure that information. Time will solve the problem." However, this technology gap is not only evident in 'well-equipped' western societies but also in Africa. As explained in paragraph 5.2.2.3, youth are also in Africa the driving force in developments in ICT. Moreover, most experts predict that ICT will become more and more widely dispersed in Africa. Thus, one can hope that that time will also in Africa eventually solve the problem of authoritarian, hierarchical styles of teaching.

7.2.5 African Diasporas facilitating cultural dialogue

In Paragraph 4.3.3 it was argued that by involving African Diasporas in the creation and adaptation of OER, the process of brain drain somehow be circumvented due to the borderless nature of OER. Moreover, it can also be assumed that since African Diasporas already play significant in the cultural dialogue between Africa and the West African, they possible also could play mediating role in dealing with cultural frictions which might arise during the implementation of OER. Uzo agrees: "African Diasporas live in two worlds. There is a Nigerian saying which says 'If you are a child that goes out, that travels, you are will be wiser than an old man at home'. Diasporas know the African and the other world. They can bring a balance in terms of quality. They know how to bring in the best from outside and balance it with what is good from the inside. The Diaspora can actually breach the cultural gap between the West and Africa." Also Hoffmann thinks the Diaspora could fulfil that role, though on the condition that proper mechanisms are put in place to make this happen: "I think the Diaspora can definitely make a contribution here if the respective organisational and management

models are implemented to do this.” Nonetheless some respondents wondered to what extent such mechanisms can be established. Cappelle reasons for instance: “Including African Diasporas in the OER movement is definitely an interesting idea and seems to have a lot of potential, but practically I cannot envision how this would work at least in the near future – for example, how to reach out to African Diaspora and educate them about the potential of OER and how to contribute to OER? But once OER becomes more widely known and more accessible to non-OER ‘experts’, maybe this could work.”

7.3 Technological appropriateness

7.3.1 Perception challenges

Intertwined with cultural relevance is the issue of technological appropriateness: how and to what extent technologies are used often depends on the expectations people have about such technologies and their cultural acceptance. Thus, in order to implement OER successfully, people need not only to be equipped with the skills in order to be able to use and create OER, the technology that comes with it should also be perceived by the end users as suitable to meet their educational needs. Omedo makes for instance clear how even in cosmopolitan areas many people don’t see a connection between ICT and education: “A small elite use computers only for email .There is a perception challenge. People need to be convinced of the use of internet in education. Only recent students use the internet for research.” Similarly, Uzo explains: “There are computers in every office in Nigeria. However, the computer is on a nice desk and they cover it with a nice cloth, but they don’t use it.” However, according to Marquard, if people can see the benefits of OER, such perceptions might change and this change might actually drive improvements in ICT infrastructures: “The access issues will change when people recognize a compelling need for such change, and the more locally adapted and created OER become available and its application demonstrated, the more a compelling need is created for people to get online. Thus, in this respect it is important to create capacity to create more local OER, rather than focus only on infrastructural issues.”

7.3.2 Level of education

Whether the use of certain technologies is appropriate also depends of course on the level of education. Molakku argues for instance that children at the elementary school level do not appreciate technology as much as high school students or university students. Moreover, many elementary schools don't have computers and it will be easier to start OER project where people are already used to using computers and where already an ICT-infrastructure is put in place. Many respondents agreed that due to these reasons elementary schools are probably not the best place to start OER-projects. Tucker reasons for example: "You need to start where you can make a difference, and you can make a difference when people have connectivity. Universities are usually quite early in that process. The need for education though, is quite bigger. There are many more people that need education. Unfortunately, they don't have connectivity."

In addition, D'Antoni argues for instance how even creative solutions that circumvent the lack of broadband access in many African educational institutions (such as for instance discussed in paragraph 3.2.4) are not likely to work on the primary school level: "OER should focus on higher education and not basic education: going to primary school you have schools spread across the country and the access becomes a real problem. There is a project at the University of Iowa. They focus on higher education but it addresses an issue of access in a nice simple creative way. The university will work with African universities to determine what it is that they would like to have from the web and then just simply load it onto a hard disk and then send it by mail to the university. It's an elegant interim solution. I don't think though that this would be possible at the level of primary education." Nonetheless, by targeting teachers, OER can still reach out to elementary schools without the need to provide every child with access to a computer. This is actually, as discussed in paragraph 2.3 and 3.5.2, the strategy of the TESSA programme, which by being run from universities, circumvents the access problem at elementary schools by aiming to upgrade the skills of primary school teachers.

7.3.3 Mobile technology

However, according to some, something can be done about the problem of access; not only on elementary schools but throughout whole of Africa by installing cost-effective wireless broadband networks⁴⁸ and exploring the possibilities of mobile phones and laptops. They argue that as these devices use batteries, they are less vulnerable to power shortages. In addition, it is also possible to design power-adapters for these mobile devices which can handle sudden power surges. On first glance though, especially a mobile phone doesn't seem to be a suitable device to deliver OER. However, as the distinction between mobile phones and mobile computers becomes increasingly blurred. It is likely that in 2010 mobile phones will have the processing power of today's computers and can transfer voice and data (including video) to a separate projector. This projector can be a pair of glasses that will display images, text, or spreadsheets in a "heads-up display" (a product already near to commercial launch) or a more conventional classroom projector. Phones will also be able to receive input from a separate wirelessly connected keyboard. Moreover, it is expected that by 2010 there will be 2.5 billion users of mobile devices in developing countries (Atkins, Brown & Hammond, 2007: 74).

Notwithstanding these positive developments though, the question remains if with a blurring of the distinction between computers and mobile phones there will also come a blurring of prices. Moreover, although the expectation of the explosive growth in the use of mobile phones is likely to take place, one can wonder to what extent these devices will be of the high-tech kind needed to deliver video and web-based OER. Hoffmann explains for instance: "the argument that by 2010 there will be 2.5 billion users of mobile devices may be misleading. Have you seen mobile devices in developing countries, I mean those that are widely used: the old refurbished stone-age types? They are nice for SMS-messages and stuff like this, not for video or internet. And even if people would have a mobile phone with video and internet options, how much can you see on a mobile screen?" In addition, Hoffmann argues that it is not very likely that mobile networks in Africa will be fast enough to transfer for instance video: You must also take into account the wireless network which is a GSM network or a GPRS network.

⁴⁸ An estimation of the cost to such technology in a one million inhabitant province of Vietnam found for instance that it could provide 2 Mbps of internet bandwidth to rural communities for less than \$1 dollar per year per rural household, see: Atkins, Brown & Hammond. p. 77

This network is not suitable for transition of video. You need different network technologies in order to be able to use dynamic media on mobile devices. In Africa there is no market for implementing these new technologies.” Nevertheless, Hoffmann favours mobile technologies over the fixed-cable, but argues that such networks don’t have to be necessarily mobile phone networks, as the use of low cost peer-to-peer network technologies might be even more promising: “There will be devices available, like the one laptop-per-child, or other low budget computers which have build in peer to peer network devices, which are kind of a substitute for GSM and GPRS networks. The GSM network is not suitable for higher capacities, but if you have peer to peer computers, then these computers can easily exchange bigger files over distance.” Nonetheless, some argue that bandwidth is not the biggest problem, like for instance Selinger from CISCO systems. She believes that the connectivity issue can be solved and that the bottleneck will rather be the device: “Devices are expensive, even the one laptop per child costs 200 dollars.”

However, according to Traxler, a specialist on mobile technologies and education, even when the problem bandwidth and the costs of the devices would be solved, there are still many questions to be answered. For instance about how the sociology of people’s use and expectations of mobile devices can be matched with educational objectives: “How people interact with various devices is all different. The use of mobile devices is always very spontaneous, informal, opportunistic and short. People’s use of television is usually social and people’s use of computers is quite structured and premeditated and might last forty or fifty minutes. So that is the usability problem. Is it possible to build objects that actually work along that range of expectations?” In general though, Traxler is very positive about the possibilities of mobile technologies to deliver OER: “Any country should go for mobile technology because it is socially and economic sustainable. There is no need to buy the devices for learners, as students and the rest of society already have them. If we say, e-learning got to take place on computers; then they say: give us a computer. If we say, learning is going to take place on a mobile phone; then they already got one.” In addition, he thinks that prices of mobile phones, and also the more sophisticated ones, will go down once companies think they can reach economies of scale: “If they think they can roll them out in vast numbers to the bottom of the economic pyramid, then prices will go down. The price in the near future for a high-tech mobile phone will be 50 dollars.”

7.3.4 Too much tech could be wrong

Nonetheless, even when the problems of access to computers and internet can be solved, whether by using mobile devices, there still remains the already discussed perception challenge. According to many respondents, this challenge can best be overcome by focusing on the usability of technologies instead of focusing on its sophistication. Traxler warns for instance for a too big focus on high-tech solutions and recommends a more holistic view which includes an examination of how less sophisticated technologies can be used to deliver educational materials: “It all depends on using the appropriate technologies to deliver and support OER. I am worried that the implementation of OER built around high bandwidth, institutional, metropolitan type solutions that we find in Europe or North America will make technological problems only worse than better. I am thinking in part of the AVU approach, which is quite a high bandwidth, big institutions, and metropolitan kind of solution. I always worry about solutions that don’t cross the last mile. We do need to look to ICT to deliver OER in the broadest sense, including satellite television, or old fashioned audio cassettes and maybe more kind of agile, narrow band, personal mobile technologies, or for instance sending CDs by post.”

In addition to the technology though, some respondents argue that also the OER themselves should use simple technologies and should be easy to use and create OER. For instance, Tucker advises the FLOSS4Edu project to stick to the Wiki-environment and not to focus on upgrading to for instance the more complex rice-connexions-framework. He thinks that too much complexity will undermine participation in the project. Similarly, Cappelle argues: “Discussions about OER (such as in the UNESCO-IIEP OER forum) are often very complex, technical and theoretical with little emphasis on the issue of accessibility. With accessibility, I mean the ease by which people will be able to use and produce OER, and the level of skills and type of technology needed to do so. Knowledge in the form of text is of course useless for those who are illiterate. So one aspect is producing knowledge in a form that is accessible to people, and the second aspect is developing the capacity of individuals and institutions to absorb, understand, act on, produce and exchange knowledge in different forms. Thus, personally I am interested in more simple OER solutions and not complex content-management systems which require registration to use, or long manuals for creating OER and having to navigate through a sea of copyright issues.”

7.3.5 Possibilities for OER created and transmitted by video to reach out to rural communities

In addition to that ‘too much tech could be wrong’, also ‘too much text could be wrong’. Selinger notices for instance about the TESSA programme: “TESSA’s resources are very text-based, with little visual clues; a lot of the people who are going to be trained to be teachers might lack the necessary skills to use these resources, so you need stimuli that are really going to help them to learn.” Such visual stimuli are especially important when using OER to service disadvantaged groups, and especially rural communities or the many illiterate people from rural areas who have migrated to live in slums in metropolitan areas. Negash explains for instance with respect to rural Ethiopia: “eighty-five percent of the population in Ethiopia is rural. You can’t reach them with a keyboard and a mouse. That is a significant training barrier you have to overcome. Maybe a more visual, image based approach of OER could work.” Cappelle agrees and comes up with the idea to use video to target rural communities:

I think that OER is too much associated with text. Personally, I am also very enthusiastic about other forms of transmission, in particular video. Not only because video itself is very accessible (just look at for instance you-tube or its educational version teacher-tube), but also because a video is relatively easy to make. Even analphabetic people would be able to make a film – although the software to do this could be made more easy to use. I base this on my experiences in rural villages in India where I have seen illiterate children surf the Internet and do other kind of complex things with computers. Videos can also easily be produced in local languages, as speaking is for many people easier then writing. Nonetheless, the technology still has to become cheaper. However, this seems likely to happen, seen the recent integration of video-cameras into mobile phones.

Also D’Antoni sees potentials in the medium of video to implement OER-projects in rural communities. However, she wonders to what extend the technology of video is really easy to use: “I do know though, that many years ago in Canada videos were used very frequently and effectively in societies with very low socio-economic status. But how can making a video be simple? It does require certain skills as well. If it is not simple it can make problems.” Nonetheless, the use of video to reach rural communities seems to be an interesting idea which is worth to be researched and further investigated.

7.4 Conflict sensitiveness

7.4.1 Introduction

As has been discussed in paragraph 5.3.1, many African countries are experiencing civil conflict or are just emerging out of civil war. This is not the case for every African country, but in general, conflict is unfortunately an issue which should be taken into account for a successful implementation of OER. This section will examine in this respect with the following two problems: 1) as we have seen, although the ideology behind OER seems to be conducive for the establishment of conflict sensitive educational structures, OER-projects might in themselves also be sources of conflict. 2) Moreover, conflict itself might make it very hard to run OER projects. Not only because conflict might devastate the infrastructure needed to deliver the concept but also because people needed to run the project might be forced to leave.

7.4.2 Implementing OER in a conflict sensitive way

The fact that OER might actually be a source of conflict calls for the need for a critical and uncompromising analysis of how OER might unleash such destructive processes, whether on the individual, institutional or on the societal level. This, so that proper conflict transformation mechanisms can be put in place to channel such possible destructive processes into something constructive. As conflict comes in many forms and has many different dynamics, it is hard to come with generalizations and more research is needed. Nonetheless there are a few general comments that can be made. First of all, it is of course of very important for project staff to make an effort to know more the social context they are working in. Molaku recommends for instance with respect to implementing OER in rural communities: “You need to understand the community you are dealing with, you have to study communities, social settings, and approach respected leaders who can elect representatives around the community. Discuss the technology you aim to implement, make clear you only try to implement a beneficial technology. Then there is no reason for conflict.” In addition, the recommendations given in paragraph by Seitz which seem to be in general in line with the ideology of OER should of course also be taken

into account in the implementation of OER projects. Thus, in line with the first recommendation, projects should if possible aim to service all population groups and also attract staff among these different groups with the aim to improve cultural diversity. In addition, in line with the second recommendation, the way projects are run should also be as democratic and participatory as possible. Moreover, especially when projects involves groups who are in conflict with each other, it is important in line with the third recommendation to organize the project in such a way that conflicting parties will engage and communicate with each other through a process of dialogue.

7.4.3 Reducing risks posed by conflict to OER

In addition, projects undertaken in risky areas should have a back-up plan in case things go wrong. What elements such a plan should contain depends again on the context and again more research is needed in this respect. One goal of such a plan could be to ensure continuity of the project. It might also in this respect, apart for other reasons, be important to rely as little as possible on ex-patriots. Aid workers and donor agencies are usually the first to leave, once fighting breaks out. In addition, it will of course be wise to have back-ups of all resources produced and have them available on a server in a less conflict prone region. Moreover, on first sight, mobile devices also offer opportunities to ensure some sense of continuity. They do not only offer possibilities for refugees and internally displaced people to continue accessing OER. They are also easier to move preventively, once there are signs that civil conflict might erupt.

7.5 Ownership

7.5.1 Introduction

Another often cited obstacle to the implementation of projects in Africa, and especially to those that are donor-driven is a lack of ownership. Although any development project should find ways to deal with this issue, ownership is especially relevant to take into account in order to successfully implement OER. Again and again during this thesis it has been stressed that Africans themselves should become involved in the adaptation and creation of OER for a

number of reasons: to fight the process of information imperialism, to make African knowledge more relevant to African needs, to assure quality according to these needs and to increase cultural appropriateness. However, apart from ownership of the content, there should also be ownership OER projects and their funding by Africans themselves. As was already demonstrated in paragraph .., donors are often not the most reliable partners. However, apart from this, they might also inhibit ownership of OER projects by Africans.

7.5.2 Need to design participant driven, donor-supported projects

One way of getting around this problem would be if Africans design an OER strategy first, before letting donors come in. According to Bateman, this could for instance happen in the following way: “African universities need to formulate a strategy about how they wish to fund. Partially, that funding might come from the donors, but not all. You have to get the university decision makers and policy makers to a point where they are prepared to adjust policies conducive to the OER movement. Rather than having a donor, it would be better to have a participants meeting to establish what the needs are, to establish what the role of the donors might be and what the timeframe of any involvement would be. It should emanate from the OER participants in Africa. The role of donors would be to support a strategy that the participants device”. Also Mackintosh envisions a participant-led strategy in which donors can come in to support already existing structures: “We have to develop solid, well thought through projects that in their own rights are going to be successful, irrespective of the funding. Then if the funding comes in, it is a bonus to make it happen quicker. It is about taking responsibility for our own needs and moving it forward. Donors should come in to support already started projects that are inherently sustainable and inherently will make a difference. So I think we should focus on building capacity and empowering ourselves to actually look after ourselves and then get the donor funding to follow those projects, rather than being dictated by the needs that donors dream up.”

7.5.3 Donor’s support of participant driven initiatives

However, not only participants in OER projects think this way. Also donors, and especially those described in this thesis, emphasise the need for ownership. This has for instance been

demonstrated in paragraph 6.5.6 by UNESCO's and the Hewlett Foundation's identified need to find African champions to move the process forward. In addition, it is also the Hewlett Foundation's aim to build on already established structures, as Johnstone explains: "The Hewlett Foundation takes a very long range approach to it. Their notion is to try and pick structures that are already in place in order to make projects sustainable. Not just to start new activities." Another reason for donors, though, for the need of local ownership has to do with a lack of expertise, as Casserly admits:

We are trying to do this globally and Hewlett in education doesn't have expertise in Africa. That is why when we set up with the African university we want to rely on local expertise. One of the challenges with the AVU is that Hewlett doesn't want to go in and provide course support, we are interested in supporting project support for OER but we don't know how to drive an organization in Africa, it is inappropriate, we don't have the right expertise. We can't be experts everywhere. So the challenge is maybe how we can help nurture an OER African project or organization. At the same time, we can't be the sole funders, we can't be the sole drivers. We can help the African Development Bank to get on board or other funders. We just don't have enough staff to be in Africa to support projects as well. The idea is, that Hewlett won't fund it on its own and when others don't pick it up it is not enough of an idea. It is certain gaining traction, we are hearing more and more from interested donors, like for instance the Swedish knowledge project. They are funding an OER project in Africa and we didn't even know about them.

Thus, African ownership of OER projects will not only make them more sustainable and adapted to local situations, it is also necessary to raise the interests of donors, which especially in the start up phase will still be needed. Kerry Krige argues for instance that one way by which donors can be convinced to invest in OER projects is if Africans themselves initiate projects irrespective of the fact whether they will receive donor funding or not. Hence, the fact that according to Kim, the World Bank has not jumped on the concept of OER yet, shouldn't be too discouraging.

7.5.4 Where are the champions?

Thus, not only participants of OER projects in Africa, but also donors like the Hewlett Foundation the Commonwealth of learning and UNESCO's OER community emphasize that the OER movement should be led by Africans and so does the author of this thesis. However, then the important question arises, where are they? According to Bateman, the Hewlett Foundation for instance, still hasn't found what it is looking for: "The Hewlett Foundation believes that they should support strategic leaders across the world. As yet, they have not identified a strategic leader in Africa. They are supporting the creation of an OER centre in Nairobi though, to device a new structure for the OER movement." On the other hand, Mackintosh from the Commonwealth of learning thinks that the OER movement which started in the West will in the end be led by Africa, as he explains:

The leadership and the innovation around OER will come from Africa and will be lead by Africans for Africans. I don't think there is a lack of leadership at all. I think there is tremendous leadership in Africa. I am certainly observing it. In East Africa I see a significant shift in the thinking of decision makers away from the notion of closed access. There is a clear leadership commitment towards an OER strategy. There are now African governments who say, 'access is not the problem, we need to get the content.' I haven't seen that leadership anywhere else in the world. There is a very clear commitment in moving the content agenda forward. Just see what is happening with floss4edu. That is an initiative which recognizes that access is not the problem. Floss4edu is endorsed and supported by government leaders and the communities from all over Africa, including Nigeria, Uganda and Tanzania."

However, some people might be a little bit sceptical about this very positive view of Mackintosh, and might see it as just another donor selling story of a concept presented in perfect shape. Whether Mackintosh is right though, can in end only be proved if there is some real social impact on society. For now unfortunately, this impact is still very modest and 'modest' might even be an understatement. Nonetheless, the OER movement is still at its very beginning, even in the West. Thus it is hard to make any predictions, whether positive or negative. One thing is certain though, and that is that if Africans don't take the lead, all prospects for a successful implementation of OER will just disappear, and with it any possible contribution of OER to increase knowledge dissemination in Sub Saharan Africa.

7.6 Conclusion

As the OER movement has been mainly conceptualized in the West, there is a danger that the concept of OER or its implementation might be culturally inappropriate. The further away material has been developed, whether geographically or socially, the less relevant it is likely to be. Nonetheless, cultural relevance also depends on the level of universality of the subject taught, the level and type of education and the kinds of populations targeted. African cultural roots are also factors to be considered, such as for instance its oral culture or its more communal culture, which is actually conducive to the concept of OER. However, Africans often hierarchical and authoritarian style of teaching, which can be seen as remnants of Africa's colonial past, pose a threat to more participatory, democratic teaching styles. This leads to the strange paradox that although the creation centered model of OER seems to be the most appropriate to increase cultural appropriateness, it might actually be the least accepted model for older generations of teachers. Nonetheless, the younger generations might change this, due to their higher exposure to the information society

For now though, there is a perception challenge which has to be overcome. OER can only become successful if Africans can see that ICT and OER can also serve educational purposes. Such a perception change could in turn also stimulate the further development of ICT infrastructures. Whether OER will be technological appropriate also depends, just like cultural appropriateness, on the level of education. Universities seem to be a good place to start OER projects, especially when they have experience with ICT. A way to reach elementary schools with OER could be by teacher education programs run from Universities. This is actually the strategy of the TESSA program.

Another important issue is the potential of mobile technologies. According to some, mobile technologies will solve the connectivity issue, but many are skeptical about this. There are concerns about the type of network needed, the costs of mobile devices and about their usability for educational purposes. Nonetheless, mobile technology can be seen as a positive development for Africa. However, 'too much tech' could also be wrong, and a holistic view is recommended which puts usability of technologies and not their level of technological sophistication in the first place. Deliverers of OER other than the internet, such as for instance television, radio or video or sending CDs by post should also be considered. Sometimes, OER

with visual clues might be more effective than text based resources. Video could play in this respect for instance a role in servicing with OER illiterate disadvantaged communities. People who can't write often can make a video. However, video-technology still needs to become cheaper and easier in use, and more research is needed about its possible application.

Conflict unfortunately, is also an issue that needs to be considered. First of all, the implementation of OER itself should be done in a conflict sensitive way. This requires a thorough analysis of how OER might possibly unleash certain destructive processes. Moreover, in line with the recommendations of Seitz, projects should aim to serve all population groups, be run as participatory and democratic as possible and promote dialogue between possible opposing groups. In addition, in risky environments, back-up plans should be made in emergency situations. Furthermore, during conflict, OER might provide some sense of continuity by keeping materials available on the internet. One of the most important issues regarding the implementation of OER though, is the issue of ownership. Ownership is important to deal with problems such as information imperialism, sustainability or economical, technological or cultural appropriateness. However, it is also important that the concept of ownership includes financial ownership. There is a need to design participant-driven, donor supported strategies and to avoid donor-led projects. This need is not only underscored by participants in OER projects, but also by donors and UNESCO's OER community. Both participants and donors are thus looking for African 'champions' to put the OER movement in Africa on the map.

Conclusion

OER offer great potentials to increase knowledge dissemination in Sub-Saharan Africa. On the other hand, the challenges to do this in an effective way are also enormous. On the educational level, strengths of OER that due to their usability and conduciveness to collaborative development and free knowledge sharing, they might offer a cost-effective solution to improve access to scientific knowledge and virtual learning environments. Moreover, they offer great opportunities for academic scholars to disseminate their scientific work. However, they might fear to release their work out of fear to lose possible revenue or not to be recognized by the international academic community. Another opportunity for can for instance come from Learner centered OER. They might provide low-cost e-learning solutions, not only to better service the educational needs of students, but also to upgrade skills of teachers, due to their suitability for life-long learning. Nonetheless, OER can't provide physical educational facilities or undo the need for real laboratories. Moreover, learner-centered OER need economies of scale and their teacher-student ratio is not always as effective as assumed. In addition, OER typically produce high skilled worker which the labor markets of African economies might be unable to adsorb.

As most OER are currently created in the developed world, there is a threat on the socio-economic level that OER will reinforce the process of information imperialism. The dumping of educational materials in African unsaturated markets created in oversaturated western markets might induce Africans to use OER of low quality or little relevant to their educational needs. Moreover, by educating Africans according to Western needs, OER might in theory stimulate the process of brain drain. On the other hand, OER are not so widespread yet in Sub Saharan Africa, nor to they offer degrees. Thus this argument might remain hypothetical. However, OER do not force anyone to use them. Nonetheless, mainly elites with access to internet are likely to profit for them. Thus, there is a threat that OER might increase the knowledge gap between such elites and disadvantaged groups. On the other hand, OER can also be used to service disadvantaged groups. In addition, OER can counter the process of information imperialism if Africans start to create OER by themselves. There is a rich array of African educational resources just waiting to be transformed into OER. African countries have a comparative advantage in creating such OER due to lower labor costs. OER created by

Africans could also counter information imperialism in the global arena; especially by creating OER in areas in service-industries where national governments are developing a comparative advantage. OER could then specifically be used for market-penetration strategies. However, this is a long term vision.

On the socio-political level, OER will according to the reinforcement thesis be used by governments in the interest of their political goals. As such, OER might increase the gap between the ruling elites and the rest of society. Moreover, OER might be censored and adapted to manipulate population groups by imposing an authoritarian way of thinking and develop 'essentialist' identity and nationalistic citizenship concepts. On the other hand, OER themselves can be copied indefinitely and as such don't become objects in fights over resources. In addition, OER and the technology related to them can also be used to enhance communication between people and as such reduce conflict. Furthermore, the reinforcement thesis can be debugged by applying it on the level of the individual: individuals will also use knowledge and new technologies according to their own interests, especially as according to some governments are less and less able to control ICT. Besides, OER can also be used in peace building programs or to promote democratic ideals. Moreover, the borderless nature of OER can be used to ensure some sense of continuity in risky environments. In addition, the notion to make information freely available in public can improve transparency. The biggest opportunity for OER though, to improve democracy and stability comes from the ideology behind OER itself. The philosophy of OER seems conducive to promoting democracy and is in line with recommendations given by the German peace researcher Seitz for the creation of conflict sensitive educational structures. Whether OER will really promote democracy and stability depends though all on the willingness of people to make this happen.

However, whether OER can realize any of its potentials all depends on their implementation. OER can of course only be implemented successfully when people have access to ICT and the skills to use them. A positive development in this respect comes from mobile technologies. There are though concerns though about the type of network needed, the costs of mobile devices and their usability for educational purposes. However, beyond the connectivity issue, there are many other obstacles that also have to be coped with. All over the world, OER projects have to deal with issues such as intellectual property rights, sustainability, quality assurance and institutional or organizational challenges, and in Africa this is not much different. Regarding intellectual property rights, the non-commercial and no-derivative works

allowed-restrictions should be avoided when possible. Both restrictions inhibit the reuse and adaptation of OER, while the latter inhibits the needed involvement of the private sector. In terms of sustainability, donor-led OER projects should be avoided and cost-effective ways of producing OER should be examined. In addition, government support is also essential in this respect. In addition, efforts should be undertaken to make OER self-sustainable. An OER model in which profits can be made with services on top of freely accessible content might be helpful in this. With regards to quality assurance, there is a debate going on between the use of producer-consumer or co-producer models of quality assurance. Filtering techniques such as provided by the rice connexions projects could accommodate both approaches at the same time, although it is uncertain whether such techniques are scalable. Regardless of the model though, quality assurance mechanisms should first and foremost emanate from Africa, also to deal with the process of information imperialism.

Also cultural appropriateness of OER projects should be considered. The more oral culture of many Africans may require different approaches, while the communal nature of many African communities actually provides opportunities for the concept of OER itself. Nonetheless, there is a perception challenge which has to be overcome. OER can only be successful if Africans can see that OER and ICT can also serve educational purposes. Moreover, authoritarian, hierarchical teaching styles might also pose of challenge, as teachers might perceive OER as a threat to their authority. This issue which though, is partly the result of a generation gap in which younger generations are more exposed to the information society. This, this problem might be solved with time when younger generations grow older. Apart from a need for cultural appropriateness though, there is also a need to for technological appropriateness. Both are also dependant on the level of education. It seems that Universities are the best places to start OER projects as they are more likely to have experience with ICT. Primary schools could still be reached with OER by targeting their teachers with OER programs run from universities. This is actually the strategy of the TESSA program. Technological appropriateness also calls for emphasizing usability of technologies over their level of sophistication. Delivers of OER other than the internet should also be considered, such as for instance television, radio, or video. Other solutions could include sending CD or hard disks by post or by using stand-alone solutions such as for instance Freedom Toasters⁴⁹. Video might play in this respect a role in servicing with OER illiterate disadvantaged communities. Conflict is also an issue which

⁴⁹ See www.freedomtoasters.org

should be taken into account. First of all, OER should be implemented in a conflict sensitive way and before implementation first an uncompromising analysis should be made of possible destructive forces such a project might unleash. In addition, in risky environments back-up plans are needed in case of emergencies. One of the most important issues regarding the implementation of OER is ownership, including financial ownership. This adds to the need to design participants-driven donor supported strategies and to avoid donor-led projects.

As regards the question whether content, learner or creation centered types of OER are the most appropriate, there is no conclusive answer as this all depends on the context. Nonetheless, on the whole it seems that creation-centered models of OER offer the most advantages to increase knowledge dissemination in Sub Saharan Africa. They seem to be the most appropriate to stimulate collaboration in the development of OER, to make African education more relevant to African needs, to counter the process of information imperialism, to promote democratic learning cultures and conflict sensitive educational structures. Moreover, creation centered OER and quality assurance mechanisms seem to be the most cost effective. Nonetheless, some have doubts about the quality of such creation centered-OER. Furthermore, although they seem to be the most inherently conducive to increase cultural appropriateness, they might be actually the least accepted type of OER, especially by teachers from older generations.

Nothing though, of the potential of OER will materialize, when the concept is not embedded within a wider institutional, nation, African wide and international policy framework. Such a framework should include a structure of incentives for academics and teachers to create OER. In the short term though, it is important to affect policy change by establishing OER-networks to raise awareness and build capacity around the concept of OER. Furthermore, pilot-project should be initiated and more research carried to establish some tangible proof to governments, donors and educational institutions that the concept might work. Therefore, champions on all levels are needed to move the process forward. This need has been underscored by participants in OER projects, donors, but also UNESCO's OER community. The bottom line remains though, that OER should be applied according to African needs. By generating knowledge about these needs, OER could not only make African education more relevant to local developments and thus spur innovation, economic progress and stability; it could also lead to a higher appreciation of Africa by the rest of the world.

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List of Abbreviations

AVU	African Virtual University
CERI	Centre for Educational Research and Innovation (OECD)
DEEP	Digital Education Enhancement Project (Open University UK)
DSF	Digital Solidarity Fund
EADTU	European Association of Distance Teaching Universities
FLOSS4Edu	Free/Libre and Open Source Software for Education in Africa
GLP	Global Learning Portal
GTZ	Gesellschaft for Technische Zusammenarbeit
ICDE	International Council for Open and Distance Education
IIEP	International Institute for Educational Planning (UNESCO)
ICOOL	International Conference on Open and Online Learning
IPR	Intellectual Property Rights
MERLOT	Multimedia Educational Resource for Learning and Online Teaching
MIT	Massachusetts Institute of Technology
MORIL	Multi Lingual Learning Resources for Independent Learning
NEPAD	New Partnership for Africa's Development
OCW	Open Courseware
OECD	Organisation for Economic Cooperation and Development
OER	Open Education Resources
OLCOS	Open eLearning Content Observatory Services
OU-NL	Open Universiteit Nederland
OU-UK	Open University United Kingdom
SADC	Southern African Development Community
SADC-DCE	SADC Centre for Distance Education
SSA	Sub Saharan Africa
TESSA	Teacher's Education in Sub-Saharan Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
VUSSC	Virtual University for Small States of the Commonwealth

Appendix A: Questionnaire regarding applying Open Educational Resources to the African condition

It might be helpful to keep for each question the following issues in mind: what are strengths and weaknesses of OER in relation to each question and its opportunities and threats? Are there examples that can serve as a source of inspiration? What role might social, economic or cultural factors play? This survey does not focus so much on ICT-infrastructure. If you don't have an answer, please don't answer. If you don't have time to answer all questions, please answer those questions you feel more comfortable with. If you want any quote by you used in my report first to be sent to you for approval before made public, please let me know. Thank you very much in advance for sharing your thoughts and for your time and cooperation!

Questions OER and education

- 1) Can OER be applied to achieve a cost effective improvement of quality of education through free knowledge sharing and dissemination? Under what conditions?
- 2) Can OER improve access to scientific information and educational facilities? Under what conditions?
- 3) Can OER increase opportunities for African scholars to disseminate their academic work? Under what conditions?
- 4) Can OER alleviate the problem of overcrowded universities by servicing better larger numbers of students with few available teachers? Under what conditions?
- 5) Can OER improve the availability of qualified teachers on high schools and universities? Under what conditions?
- 6) How can OER make African education more relevant to African needs? Under what conditions?
- 7) What are your additional thoughts on how OER can improve education in Africa? Under what conditions?

Questions OER and socio-economic factors

- 8) Is there is a danger that OER reinforces the process of information imperialism? Can this process be reversed by focusing on the creation of African OER?
- 9) Is there a danger that OER reinforces the process of brain drain? Can this process be reversed by focusing on the creation of African OER? What role can play African Diasporas play in this?
- 10) Can OER improve access for disadvantaged groups to education and knowledge?
- 11) What are your additional thoughts on OER in relation to socio-economic factors?

Questions OER and socio-political factors

- 12) Can OER be used in Africa to improve democracy and governance? Might OER also be used to reinforce the status quo?
- 13) What are your additional thoughts on the relationship between OER and democracy?
- 14) What effect will OER have on civil conflicts? Can OER be used for the creation of conflict sensitive educational structures
- 15) Please add any other thoughts on OER in relation to socio-political factors

Questions about the implementation of OER

- 16) How should OER be implemented?
- 17) How can OER projects be sustainable? What kind of business model should be sought?
- 18) What mechanisms of quality assurance should be sought?
- 19) Is there a lack of leadership among Africans?
- 20) What pedagogical and cultural dispositions in Sub Saharan Africa should OER take into account in order to make their application effective?
- 21) Please add any other thoughts you wish to add

Appendix B: List of consulted experts

Experts from Africa

Prof. Derek Keats	Executive Director Information and Communication Services, University of the Western Cape, South Africa
Stephen Marquard	Learning Technologies Co-ordinator, Centre for Educational Technology, University of Cape Town, South Africa
Alex Mulaku	Graduate Engineer of Nairobi University, Kenya
Geoffrey Omedo	NEPAD Kenya Secretariat, Kenya
Dr. Ndege Speranza	Senior Lecturer Kenyatta University, Kenya, Former Director AVU Kenyatta University, Kenya
Guilaine Thébault	Centre d'Etude d'Afrique Noire (CEAN), Senegal
Kim Tucker	Researcher on ICT and education for the Meraka Institute (African Advanced Institute for Information and Communications Technology), South Africa

Experts from the African Diaspora

Dr. Wayne Mackintosh	Education specialist, eLearning and ICT policy, Commonwealth of Learning, Canada
Dr. Solomon Negash	Program coordinator Bachelor of Science in Information Systems at Kennesaw State University, United States
Mary E. Uzoh	Expert on ICT-learning solutions and interactive multimedia African language software. Consultant of Learning Right, California, United States.
Dr. Clayton R. Wright	Expert Canadian consultant on educational technology, distance education, curriculum development, instructional design and professional development in international settings, especially regarding developing countries

International experts

Prof. Susan d'Antoni	Director of the International Institute of Educational Planning, UNESCO, France
Peter Bateman	Program coordinator TESSA-programme Nairobi, researcher for the Open University United Kingdom focusing on OER in Africa, Kenya
Dr. Cathy Casserly	Program Officer Education, the William and Flora Hewlett Foundation, United States
Frank van Cappelle	Expert on use of ICT in education and reduction of barrier of access to and usage of ICT in developing countries, International Institute of Educational Planning, UNESCO, France
Sebastian Hoffman	eLearning-/ICT consultant of Hoffmann & Reif Consultancy (organisation which facilitates eLearning Africa conferences on ICT, Education and Development), Germany
Prof. Sally Johnstone	Vice President for Academic Affairs Winona State, consultant to Hewlett Foundation regarding the implementation and evaluation of OER projects funded by the Hewlett Foundation, United States
Ronald Kim	Program Officer for the Knowledge for Development Program, World Bank, United States
Kerryn Krige	Project and Development Manager South Africa for Digital Links International, South Africa
Dr. Michelle Selinger	Global Education Strategist for CISCO Systems' Corporate Affairs, United Kingdom
John Traxler	Expert on application of mobile technologies for education with a special expertise regarding developing nations, especially Sub-Saharan Africa, University of Wolverhampton, United Kingdom
Prof. David Vincent	Professor in Social History and Pro Vice-Chancellor (Strategy Planning and External Affairs) at Open University United Kingdom

Appendix C: Some OER-initiatives relevant for Sub-Saharan Africa

Initiatives based in Africa

- a. The Free/Libre and Open Source Software for Education in Africa (FLOSS4Edu) initiative has been set up with the aim of promoting the development of free content by Africans for Africa, by using wiki-based technologies
http://www.wikieducator.org/FLOSS4Edu#Educational_Content
- b. The Commonwealth' of Learning Virtual University for Small States of the Commonwealth, in which also small African states, including Botswana, Lesotho, Mauritius, Namibia, Sierra Leone, Swaziland and the Gambia participate in the creation of post-secondary, skills-related OER
<http://wikieducator.org/VUSSC>
- c. The Open University United Kingdom and the African Virtual University based in Nairobi initiated the Teachers Education in Sub Saharan Africa Program (TESSA). TESSA OER focusing on core teaching skills at the primary level together with a consortium of 14 African universities and the Commonwealth of Learning and the BBC World Trust. TESSA also allows teachers to adapt and create customized OER
<http://www.tessaprogramme.org>
- d. In 2000, seven countries from the Southern African Development Community (SADC) initiated STAMP 2000+, and developed 1,800 pages of OER clustered in 18 modules to train and upgrade upper primary and junior secondary teachers and administrators in Southern Africa. The materials were localised for each participating country.
<http://www.edsn.net/na/Resources/STAMP2000.htm>
- e. Meraka Institute is developing a collection of papers describing use of OER in tertiary education, in primary and secondary schools and within communities in South Africa.
www.meraka.org.za/
- f. The University of Western Cape, South Africa, launched in August 2006 its Free-Open Courseware policy and became the first African member of the OpenCourseWare consortium and actually the first university in the world to actively reward staff for the creation of OER
<http://freecourseware.uwc.ac.za>
- g. University of Mauritius held the ICOOL Conference (International Conference on Open and Online Learning) in South Africa
<http://vcampus.uom.ac.mu/vcilt/index.htm>
- h. OER will be one of the topics of the 3rd International Conference on ICT for Development, Education and Training to be held in 2008 in Accra, Ghana
<http://www.elearning-africa.com/>
- i. The AVU and the Open University UK are planning to set up an OER expertise centre in Nairobi to ensure the efficient and effective application of the open content

movement in African higher education and training institutions and is initiating related capacity-building initiatives

- j. The in 2006 founded Southern African Development Community Centre for Distance Education (SADC-CDE) has carried out OER Instructional Design Methodology training workshops in Malawi and in Zambia and plans to perform an OER open distance learning needs assessment within SADC-CDE member institutions and to develop a plan of action regarding the adoption of OER's within the Southern African Region in collaboration with the FLOSS4edu project
Source: http://wikieducator.org/SADC-CDE_FLOSS4Edu_Southern_African_Chapter

Some international initiatives relevant for developing OER in Sub Saharan Africa

- k. United Nations Educational Scientific and Cultural Organization International Institute for Educational Planning are creating an international community of practice on Open Educational Resources
<http://www.unesco.org/iiep/virtualuniversity/forums.php>
- l. Academy for Educational Development for the Global Learning Portal projects is designing a website supporting educators in developing countries.
http://www.open.ac.uk/developmentoffice/p2_2.shtml
- m. Development Gateway Foundation is developing a topic page on Open Educational Resources (OER) for the web-based portal
<http://developmentgateway.org/openeducation>
- n. University of Iowa for Widernet is delivering and sharing open educational resources in Africa
<http://widernet.org/>
- o. African e-Journals Project - a collaborative effort of Michigan State University, the Association of African Universities and the African Studies Association - aims to improve the accessibility, visibility, and viability of African journals by helping African journals develop full-text digital versions of current issues and back issues.
<http://africa.msu.edu/AEJP/>
- p. Hoffmann & Reif Consultancy trained hundreds teachers across Sub Saharan Africa with their Comprehensive Package for Building eLearning Organizations, an interesting commercial eLearning capacity building-programme, which is based on and promotes the use of open source platforms and open content license models.
http://www.hoffmann-reif.com/e3025/e677/index_eng.html

Appendix D: Some useful websites about OER for the global OER community as a whole

Practical information about the use and creation of OER

OER-Commons	www.oercommons.org
OLCOS	http://www.olcos.org/english/home/

Websites of some international organizations

UNESCO's IIEP	www.unesco.org/iiep/virtualuniversity http://www.unesco.org/iiep/eng/focus/opensrc/opensrc_1.htm http://oerwiki.iiep-unesco.org
OECD's CERI	www.oecd.org/edu/oer http://www.oecd.org/document/20/0,2340,en_2649_33723_35023444_1_1_1_1.00.html
Hewlett Foundation	http://www.hewlett.org/Programs/Education/OER/

Virtual laboratories

Opensciencegrid	www.opensciencegrid.org/
Teragrid	www.teragrid.org/programs/sci_gateways/

Appendix E: Creative Commons Licences explained⁵⁰ (see also: www.creativecommons.org)

Introduction

Creative Commons licences are part of a genre of licences that are used to negotiate legal rights in digital content. Many other types of open content licences exist; however, the Creative Commons licences have gained significant attention and popularity over the last three years. The Creative Commons licences are not designed for software, but are intended for use in relation to other kinds of creative copyright material: websites, educational materials, music, film, photographs, blogs, etc. Along with the text of various open content licences, the project has developed metadata that can be used to associate creative works with their licence status in a machine-ready way. In addition to certain “baseline” rights and restrictions which are included in all Creative Commons licenses, the copyrights owner can choose among a number of licensing options, which can be used alone or in combination.

Baseline features

The following features are common to all Creative Commons licenses:

- Licensees are granted the right to copy, distribute, display, digitally perform and make verbatim copies of the work into the same or another format
- The licences have worldwide application for the entire duration of copyright and are irrevocable
- Licensees cannot use technological protection measures to restrict access to the work
- Copyright notices should not be removed from copies of the work
- Every copy of the work should maintain a link to the licence
- Attribution must be given to the creator of the copyright work (BY)
- They are “fair use/fair dealing plus” in that they grant a layer of protection on top of and in addition to the scope of activity that is permitted under existing copyright exemptions and limitations

Optional features

- Non-commercial (NC): Others are permitted to copy, distribute, display and perform the copyright work – and any derivative works based on it – but for non-commercial purposes only
- No derivative works (ND): Others are permitted to copy, distribute, display and perform exact copies of the work only and cannot make derivative works based upon it

⁵⁰ Source: (Hylén & others, 2007) based on: (Fitzgerald, 2006)

- Share alike (SA): Others may distribute derivative works only under a license identical to that covering the original work

By mixing and matching these elements, copyright owners can choose between the following six core licences:

- Attribution (BY): This is the most accommodating of the licences offered, in terms of what others can do with the work. It lets others copy, distribute, reuse and build upon the work, even commercially, as long as they credit the copyright owner for the original creation
- Attribution-Non-commercial (BY-NC): This license lets others copy, distribute, reuse and build upon the work, as long as it is not for commercial purposes and they credit the copyright holder as the original author
- Attribution-Share Alike (BY-SA): This licence lets others reuse and build upon the work even for commercial purposes, as long as they credit the copyright holder and licence any derivative works under identical terms
- Attribution-Non-commercial-Share Alike (BY-NC-SA): This licence lets others reuse and build upon the work, as long as it is for non-commercial purposes, they credit the copyright holder and they licence their new creation under identical terms
- Attribution-No Derivatives (BY-ND): This licence allows use of work in its current form for both commercial and non-commercial purposes, as long as it is not changed in any way or used to make derivative works, and credit is given to the original author
- Attribution-Non-commercial-No Derivatives (BY-NC-ND): This is the most restrictive of the six core licences. It is often called the “advertising licence” because it only allows a work to be copied and shared with others in its original form, and only for non-commercial purposes and where the credit is given to the original author. This licence does not allow the creation of derivative works or the use of the work for commercial purposes

The licenses come in three layers:

1. A “human-readable” Commons Deed, a simple summary of the licence) which describes the freedoms associated with the content in terms anyone should be able to understand
2. A “lawyer-readable” Legal Code – a (dense legal “fine print”) licence that makes enforceable the freedoms associated with the content
3. Machine-readable metadata that makes the freedoms associated with the content understandable by computers

Both the first and the second layer are “ported” (linguistically translated and legally adapted) into other languages.