

**Benefits and Challenges of OER
for Higher Education Institutions**

By

Cheryl Hodgkinson-Williams

Centre for Educational Technology

University of Cape Town

Paper commissioned by the
Commonwealth of Learning for

Workshop Discussions at the **Open Educational Resources
(OER) Workshop for Heads of Commonwealth Universities**

28 April 2010, Cape Town, South Africa

and

Workshop Discussions at the **Open Educational Resources
(OER) Workshop for Quality Assurance Agencies**

3 May 2010, Windhoek, Namibia

The Commonwealth of Learning and the author, Cheryl Hodgkinson-Williams, have licensed this work under the Creative Commons Attribution Share Alike (CC-BY-SA) licence agreement. The full legal code of this copyright contract is available at no cost at:
<http://creativecommons.org/licenses/by-sa/3.0/>.



The author would like to acknowledge the contribution to this paper by:

- Shihaam Donnelly and Michael Paskevicius for their assistance in the document review and content analysis
- Laura Czerniewicz for her insightful comments on the first draft
- Michelle Willmers for her comments and editing
- Steve Carson (OpenCourseware Project, MIT), Sukon Kanchanaraksa (Johns Hopkins Bloomberg School of Public Health), Derek Keats (University of the Witwatersrand), Andy Lane (Open University), Robert Schuwer (Open Universiteit Nederland) and Joel Thierstein (Connexions, Rice University) for so generously responding to my questions within the time constraints.

Contents

1. Executive summary.....	4
2. Introduction.....	5
2.1 Background to and focus of paper	5
2.2 Defining open educational resources and practices	5
2.3 The emergence of OER.....	6
3. Conceptual and methodological framework	7
3.1 Archer’s realist social theory.....	7
3.2 Methodological choices	8
4. Benefits of OER for higher education institutions.....	8
4.1 General benefits – potential and realised.....	8
4.2 Specific benefits: Improvement in quality of materials	10
4.3 Specific benefits: Reduction in costs.....	11
5. Challenges of OER for higher education institutions.....	13
5.1 Specific challenge: Quality assurance	13
5.2 Specific challenge: Financial sustainability	15
6. Ways forward	16
6.1 Agency of individual academics	16
6.2 Policy issues for institutions, agencies and governments.....	16
7. Conclusion	17
8. References.....	18

1. Executive summary

The emergence of teaching materials and processes as open educational resources (OER) in higher education in the 21st century is part of the much larger social movement towards 'opening up' what was previously 'closed' to all except a limited number of people who paid for access to or use of information and services. Initially OER was understood as sharing specific 'products', but it now thought of as including the underlying pedagogical 'practices'.

That academics and student tutors want to share their intellectual capital openly with the rest of the world is at the heart of the OER movement. Archer's (2003) notion of the 'active agent', offers some insight into why academics (or students) in HEIs may decide to (or not) use and share OER, and how they might respond in an institutional environment which inhibits or encourages the practice of sharing.

Many potential benefits of OER have been proffered over the last ten years, but which of these are being 'realised' in practice is only starting to emerge as there are relatively few comprehensive evaluation studies to draw upon. Evaluation studies by MIT reveal that academics do seem willing to share their knowledge and that MIT has enhanced its public image and attracted a number of self-learners from a range of countries. However, there is less direct evidence for the anticipated improvement in the quality of teaching and learning materials as an insufficient number of studies have deliberately investigated this as yet.

Anecdotal evidence suggests that OER may improve educational practices, coherence across courses, technical quality and research into pedagogy; facilitate technical improvements and the development of high quality and shareable images; and improve mechanisms for accreditation and external endorsement. Survey responses suggest that OER does not reduce materials development costs directly, but instead is still requiring additional funding. However, OER may indirectly increase the number of registrations thereby increase tuition fees; lower some of the marketing costs; and enable a new business model through offering services around OER.

While a range of quality assurance strategies has been suggested in the literature, comments from the survey reveal that QA strategies are clustered primarily around the pride-of-authorship and the institutional quality-assurance models, with some adopting user rating models. The most versatile quality assurance mechanism identified is the Connexions project's 'lens' system which enables organisations and individuals to give their stamp of approval to content on an OER site. In terms of ensuring the financial sustainability of their OER initiatives institutions are adopting a mix of strategies, but are increasingly inclining towards institutional support and exploring additional strategies as seed-funding from donor foundations ceases to be the main income stream.

While it is essential to consider the quality assurance and financial sustainability issues, it is important not to lose sight of the heart of OER – the contributors and the users. These quality assurance and financial sustainability issues need support and encourage educators' willingness to pay the opportunity cost entailed in developing existing or creating and sharing 'born-open OER' and acknowledge the OER contributions by academics as valued academic outputs.

2. Introduction

2.1 Background to and focus of paper

This paper was commissioned by the Commonwealth of Learning to provide a frame of reference for discussions and deliberations on the role of open educational resources (OER) in higher education institutions (HEIs).

The objectives of the paper are to:

- explore understandings of open educational resources and practices emerging from the literature;
- offer a theoretical perspective on why academics may decide to (or not) use and/or share OER;
- map the potential benefits against the realised benefits of OER in terms of publically available research reports;
- understand the different ways in which a selection of OER champions in HEIs around the world respond to some of the claims about improvement in quality of teaching materials and the reduction in cost when they are made available as OER;
- map the anticipated challenges against the actual challenges appearing in the literature;
- explore different views expressed on the locus of responsibility for the quality assurance of OER and on the range of OER financial sustainability models advocated in the literature and map these to the perspectives from a selection of OER champions in HEIs; and
- suggest ways forward to support and encourage academics to continue to use and share OER.

2.2 Defining open educational resources and practices

The term 'open educational resources' is used synonymously with 'open courseware',¹ 'open eLearning content' (Geser et al. 2007), 'open digital educational content' (Córcoles et al. 2007), 'open educational content'² or even 'open content' (McAndrew 2006).

In an attempt to standardise a term to connote this specific concept, the term 'open educational resources' was coined at a UNESCO meeting in 2002 (UNESCO 2002), and while this definition has been widely used to frame the concept of OER, it focuses quite strongly on the 'products' in the teaching and learning enterprise:

Open Educational Resources are defined as 'technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes'. They are typically made freely available over the Web or the Internet. [and] include learning objects such as lecture material, references and readings, simulations, experiments and demonstrations, as well as syllabi, curricula and teachers' guides. (UNESCO 2002)

¹ <http://web.mit.edu/newsoffice/2001/ocw.html>

² http://www.wikieducator.org/Open_Educational_Content

More recently the trend is to include teaching 'practices' as part of OER (Geser et al. 2007), as highlighted in the Cape Town Open Education Declaration:³

However, open education is not limited to just open educational resources. It also draws upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues.

The concept of 'open pedagogy' (Hodgkinson-Williams & Gray 2009) is in line with Conole's⁴ definition of 'open educational practices' (OEP):

... are the set of activities and support around the creation, use and repurposing of Open Educational Resources. It also includes the contextual settings within which these practices occur.

The move to incorporate 'practice' in the definition signifies the acknowledgement that content disembedded from its context is difficult to adapt without some understanding of the pedagogical and epistemological assumptions underlying the creation of the resource. The latter are of particular import as different views on what is considered 'worthwhile knowledge' are likely to increase with the ready access to materials from different parts of the world.

For the purposes of this paper OER will be understood to include teaching materials, teaching practices and their underlying epistemological assumptions.

2.3 The emergence of OER

The emergence of OER in higher education in the 21st century is part of the much larger social movement towards 'opening up' what was previously 'closed' to all except a limited number of people who paid for access to or use of information and services.

As D'Antoni points out, the OER movements is 'a young movement, with just a decade of development' (2009:3). It had its beginnings in 1999 through 'grassroots projects, such as Richard Baranuik's initiative at Rice University that eventually became the Connexions project (Baranuik 2008) and through large-scale institutional initiatives, such as MIT's OpenCourseware (OCW) project (Carson 2009) which inspired others such as Johns Hopkins Bloomberg School of Public Health. Other institutions such as the Open University (OU) in the UK and Open Universiteit Nederland (OUNL) also joined the OER through somewhat unexpectedly as, unlike a traditional campus-based institution such as MIT, their core business is distance education. The University of Cape Town (UCT) launched its OpenContent directory on 12 February this year.

³ <http://www.capetowndeclaration.org/read-the-declaration>

⁴ <http://www.e4innovation.com/>

3. Conceptual and methodological framework

3.1 Archer's realist social theory

This paper is underpinned by Archer's (2003) realist social theory, which is helpful in understanding the emergence of OER in our society. According to Archer (2007:38) the core conundrum of society is how 'we the people shape it, whilst it re-shapes us as we go about changing it or maintaining it, individually and collectively'.

Likewise with the emergence of the OER movement in 21st century society, we are challenged to understand what makes educators want to share their intellectual capital freely with the rest of the world. While this is a much more complex issue than can be addressed comprehensively in this paper, I draw on one of Archer's ideas – that of being an 'active agent', as it may offer some insight into why academics (or student tutors) in HEIs may decide to (or not) use and share OER:

Being an 'active agent' hinges on the fact that individuals develop and define their ultimate *concerns*, those internal goods that they care about most and ... [seek] to develop a course(s) of action to realise that concern by elaborating a *project*. ... If such courses of action are successful, which can never be taken for granted, [these are] translated into a set of established *practices*. ... In shorthand, these components can be summarized in the formula <Concerns→Projects→Practices>. (Archer 2007:42, emphasis added)

'Active agents ...live out their personal concerns within society as best they can' (Archer 2007:42) being 'inescapably born into a social context 'not of their making or choosing'' (Archer 2007:39). For academics or tutors the enablements and constraints emerge from within higher education and they therefore need to deliberate about:

... what courses of action to take in the face of constraints and enablements; about the value to them of defending or promoting vested interests; about their willingness to pay the opportunity cost entailed in aspiring to various goals; and about whether or not circumstances allow them to become more ambitious in their life-politics, or induce them to be more circumspect. (Archer 2007:41)

The challenge faced by the OER movement is to understand to what extent academics and tutors have an ultimate concern about sharing knowledge and how this ultimate concern can be realised in an enabling environment that encourages and supports rather than constrains and inhibits the practices of sharing.

3.2 Methodological choices

Due to time constraints, two key research methodologies were adopted: a review of selected documents (books, journal articles, reports and blogs) and an email survey to selected OER champions. To narrow down the review, two influential books were consulted (Iiyoshi and Kumar 2008; Katz 2008); three special editions on OER by Educational Technology (2007)⁵, Journal of Interactive Media in Education (2008)⁶ and Open Learning (2009)⁷ as well as the two seminal texts on OER sustainability by Downes (2007) and Wiley (2007) were reviewed; three key OER reports (Geser et al 2007; Atkins, Brown and Hammond 2007; OECD 2007) were consulted as were the blogs of prominent OER thinkers (Conole⁸, Weller⁹ and Wiley¹⁰).

The email survey was sent to ten individual OER champions known to the OER team at UCT or identified in the JIME special OER edition (2008). Four open-ended questions about quality assurance and financial sustainability were posed (Appendix A) and to which five individuals responded by email and one via a Skype discussion.

As the data is qualitative in nature, content analysis and specifically 'semantic procedures' (Bauer 2000) were used to surface the key themes and patterns in the documents and discussion.

4. Benefits of OER for higher education institutions

Many potential benefits of OER have been proffered over the last ten years, but which of these are being 'realised' in practice is only starting to emerge. The general benefits of OER are reviewed first before specific attention is paid to the promises of improved quality of teaching materials and reduced costs.

4.1 General benefits – potential and realised

The potential benefits of OER are summarised by d'Antoni (2009) according to various stakeholder perspectives. This categorisation is used to frame an expanded list of benefits and to map these against some of the 'realised' benefits being reported. Examples of the 'realised benefits' were identified through publicly available evaluation reports of the world's largest OER initiative – MIT's OCW initiative (Table 1).

⁵ http://asianvu.com/bookstoread/etp/Educational_Technology_Nov-Dec2007_issue.pdf

⁶ <http://www-jime.open.ac.uk/2008/>

⁷ <http://www.informaworld.com/smpp/title~db=all~content=g909097565>

⁸ <http://www.e4innovation.com/>

⁹ <http://nogoodreason.typepad.co.uk/>

¹⁰ <http://opencontent.org/blog/>

Table 1: OER potential and realised benefits

	Potential benefit	Realised benefit – example - MIT OCW ^{11,12}
Governments' perspective	<ul style="list-style-type: none"> Advancing knowledge by unlocking information for the benefit of all 	<ul style="list-style-type: none"> MIT's OCW visited 91 million times by 65 million visitors from virtually every country
	<ul style="list-style-type: none"> Widening participation in higher education by expanding access to non-traditional learners 	<ul style="list-style-type: none"> 43% of users of MIT's OWC are self-learners
	<ul style="list-style-type: none"> Promoting lifelong learning 	
	<ul style="list-style-type: none"> Bridging the gap between formal, informal and non-formal 	<ul style="list-style-type: none"> 42% of users of MIT's OWC are students of whom 46% use OWC to enhance personal knowledge and only 34% to complement a current course
	<ul style="list-style-type: none"> Leveraging taxpayers' money by sharing and reuse between institutions 	
Institutional perspective	<ul style="list-style-type: none"> Sharing knowledge is congruent with the academic tradition 	<ul style="list-style-type: none"> 90% of MIT faculty have published on OCW
	<ul style="list-style-type: none"> The public image of the institution may be enhanced & new students attracted Improving recruitment by helping the right students find the right programmes 	<ul style="list-style-type: none"> 82% of faculty say that MIT's OCW is an important element of MIT's international engagement 35% of freshman are aware of MIT's OCW before deciding to attend MIT
	<ul style="list-style-type: none"> Provides a resource for students & faculty that supports learning and collaboration 	<ul style="list-style-type: none"> 86% of students, 73% of faculty use MIT's OCW site
	<ul style="list-style-type: none"> Attracting alumni as life-long learners 	<ul style="list-style-type: none"> 46% of alumni use MIT's OCW site
Educators' perspective	<ul style="list-style-type: none"> Personal gain through increased reputation 	<ul style="list-style-type: none"> 29% of participating faculty report MIT's OCW has positively influences their professional standing
	<ul style="list-style-type: none"> Gaining publicity or reaching the market more quickly may result in an economic advantage 	
	<ul style="list-style-type: none"> Fostering connections with colleagues around the world 	
	<ul style="list-style-type: none"> Preserving a record of teaching innovations allowing others to build upon them 	<ul style="list-style-type: none"> 17% of educators using the MIT OCW site have reused content
	<ul style="list-style-type: none"> Leaving a legacy after leaving academia (Wiley cited in d'Antoni 2007:5) 	
Learners' perspective	<ul style="list-style-type: none"> An independent learner who has access to the Internet can access material from some of the best universities in the world 	<ul style="list-style-type: none"> 54% of MIT OCW traffic is non-US; East Asia-17%, Western Europe-11%, South Asia-9%, Latin America-4%, other regions-13% and 43% of visitors are self learners, 42% students, 9% educators
	<ul style="list-style-type: none"> OER can promote informal learning, where a credential is not needed 	<ul style="list-style-type: none"> Self learner uses of MIT OCW: exploring interests outside of professional field (41%), planning future study (20%), reviewing basic concepts in field (17%), keeping current in field (11%)
	<ul style="list-style-type: none"> Prospective students may access institutions by looking at their materials made available by other institutions 	<ul style="list-style-type: none"> 35% of freshman are aware of MIT's OCW before deciding to attend MIT

(Adapted and summarised from OECD 2007:70; d'Antoni 2009:5-6; OpenCourseware Consortium¹³)

¹¹ <http://ocw.mit.edu/OcwWeb/web/about/stats/>

¹² http://ocw.mit.edu/ans7870/global/09_Eval_Summary.pdf

This comparison between the envisaged benefits of OER and MIT's evaluation of its own practice suggests that academics do seem willing to share their knowledge and that a high proportion actually use the site. What it doesn't help us understand is what exactly prompted 90% of MIT academics to publish their materials or exactly how they are making use of other OCW materials or are likely to continue doing so. Likewise it provides evidence that some of MIT's own students are using the OCW site, but it does not as yet shed sufficient light on exactly how they are using these materials or what might encourage more students to use them. With respect to potential institutional benefits, it does seem clear that by opening up most of their courses, MIT have enhanced their public image and attracted an number of self-learners from a range of countries to the institution. There are encouraging signs that having access to OER might improve recruitment by helping the 'right' students find the 'right' programmes, which may ultimately translate into better throughput rates, but this will need to be tracked more deliberately. In addition there is the better long-term archiving, curation and reuse of teaching materials which accompanies OER. HEIs, governments and international agencies spend a great deal of resources archiving and curating research, but the same privilege has not been extended to teaching materials unless they have been published as textbooks.

While this is only a very broad comparison between the envisaged benefits of OER and one institution's evaluation of its own practice, this exercise serves to illustrate a number of issues for the OER movement as a whole, which include the need to:

- subject the growing OER projects to careful scrutiny to match the potential benefit to sources of evidence so that we have a basis for making more generalisable claims;
- build up a set of criteria and associated questions that could be used as a way to start measuring success (McGill et al. 2008:28) as the current phrasing of the 'benefits' are quite broad and not always easy to relate to a source of evidence or metric ; and
- undertake specific studies to investigate OER uptake (such as that by Petrides et al. 2008) to build up the evidence for espoused benefits in order to start tracking which of these benefits are the most meaningful to the various stakeholders.

4.2 Specific benefits: Improvement in quality of materials

Among the potential benefits of OER noted by various authors (OECD 2007; d'Antoni 2009) is the claim that the quality of teaching and learning materials can/may improve when they are made available as OER. Evidence for this claim proved quite difficult to establish in the existing literature, so the following question was posed to the OER champions: *In the light of your experience, how well has the development and sharing of OER improved the quality of teaching and learning materials at your institution? (How is it possible to tell this?)*. An analysis of the six responses yielded a range of responses (Table 2):

¹³ <http://www.ocwconsortium.org/share/share.html>

Table 2: Improvement in quality of materials

Realised improvements	Number of comments	Key beneficiary	Representative comment
Too early to tell	1	-	<i>In essence we expect the major impact of OER over time to come more from the way they cause academics and support staff to review and improve their educational practices away from more closed to more open educational practices (Lane, OU)</i>
Improved availability for students and/or prospective students	2	<i>Learners</i>	<i>Students are likely to review course materials on OCW before making course enrolment decisions (Kanchanaraksa, JHSPH)</i>
Improved technical quality of OER	2	<i>Learners Educators</i>	<i>We were able to pioneer or extend a number of e-production technologies on OpenLearn that are now widely used for standard educational material development (Lane, OU)</i>
Improved research into pedagogy	2	<i>Educators Institution</i>	<i>Another example on the pedagogic research front is that we have been able to adapt a research led web-based mapping tool (Lane, OU)</i>
Improved quality of images	1	<i>Learners Educators</i>	<i>New images (charts, graphs, drawing, etc.) have been created or adapted from copyright-protected originals for course faculty to use (Kanchanaraksa, JHSPH)</i>
Improved coherence across courses	1	<i>Educators Learners Institution</i>	<i>It is expected that faculty will review existing course content before creating new courses (Kanchanaraksa, JHSPH)</i>
Improve mechanism for accreditation	1	<i>Learners Institution</i>	<i>Those with background in certain areas may be able to waive course requirements by passing waiver exams after reviewing OCW content (Kanchanaraksa, JHSPH)</i>
Quality determined by external endorsements	1	<i>Learners Educators Institution</i>	<i>Quality is determined by endorsement through the 'lens' system in Connexions (Thierstein, Connexions)</i>
Has helped improve quality	1	<i>Educators Learners Institution</i>	<i>The OCW publication process at MIT has helped MIT faculty improve their teaching and learning materials (Carson, MIT)</i>

Of the institutions surveyed only MIT had undertaken a formal evaluation process: the other comments were anecdotal. The key quality assurance issues that emerge suggest that while it might be too early to judge quality improvement there is some evidence that OER may:

- improve educational practices, coherence across courses, technical quality and research into pedagogy;
- facilitate technical improvements and the development of high quality and shareable images;
- improve mechanisms for accreditation and external endorsement; and
- make it possible for students to have course requirements waived if waiver exams are passed which can be construed as a improvement in the quality of service that the institution provides.

4.3 Specific benefits: Reduction in costs

The reduction in the cost of materials is often cited as a potential benefit of OER (d'Antoni 2009). As evidence for this claim is also quite difficult to establish from the literature, the following question was posed to respondents in the email survey: *In the light of your experience has OER assisted in generating additional funding for your institution and if so can this be quantified?* Although this question is phrased more positively, the responses provide an indication that the potential cost reduction benefit is still some way off (Table 3):

Table 3: Reduction in costs

Theme	Number of comments	Key beneficiary	Representative comment
Apply for additional funding	1	Institution Educators	<i>Some faculty members have applied for external funding to develop training materials with the specific goal of using the OCV site to disseminate the content (Kanchanaraksa, JHSPH)</i>
Increase number of registrations	1	Institution	<i>In terms of revenue we have tracked users of OpenLearn and some have gone direct from the site to register on a course online in the same session thus contributing through course fees (Lane, OU)</i>
Lower marketing costs	1	Institution	<i>OER can help lower some costs, particularly around promotion and marketing (Lane, OU)</i>
Enable new service business model	1	Institution	<i>We are in the process of changing our business model from offering courses to offering services, in which a main part of the materials will be offered as OERs. The payments for the services should then be enough to finance the OERs (Schuwer, OUNL)</i>
Enable new funding streams	1	Institution	<i>Standard affiliate agreement with Amazon which nets us about \$40 K per year. Not huge, but money otherwise left on the table (Carson, MIT)</i>

Comments from the survey suggest that OER does not reduce materials development costs directly and instead additional funding is being sought from a range of potential funders to produce OER. However, indirectly OER may:

- increase number of registrations thereby increase tuition fees
- lower some of the marketing costs
- enable a new business model through offering services around OER
- allow for the development of alternative funding streams such as affiliate agreements with private companies such as Amazon.com, to supplement the income required to develop OER.

At UCT, the OER initiative which initiated from a Shuttleworth-funded initiative in the Centre for Educational Technology, is still in the process of being institutionalised, but like the institutions surveyed UCT is also seeking additional funding for grants to support individual or groups of academics in the production of OER ‘from scratch’ – what could be referred to as ‘born-open OER’ – in contrast to the process of converting existing resources by through copyright clearance or substantial adaptation.

With respect to the survey undertaken there is currently insufficient evidence to support the claim that the cost of content development can be reduced if more teaching materials are made available as OER. Additional research is required to evaluate how materials development (whether OER or not) is costed and funded in HEIs. What would be even more interesting to track are the strategies institutions are using to attract additional funding to produce OER.

5.Challenges of OER for higher education institutions

The categorisation of the anticipated challenges (or inhibitors) summarised in the OECD report (2007) is used to frame an expanded list of additional challenges (Table 4).

Table 4: Challenges of OER for HEIs

Type	Anticipated challenges*	Additional challenges
Technical	<ul style="list-style-type: none"> Lack of broadband and other technical innovations Interoperability 	<ul style="list-style-type: none"> Metadata standards
Economic	<ul style="list-style-type: none"> Lack of resources to invest in broadband, hardware & software Difficulties in covering cost for developing OER or sustaining an OER project in the long run 	<ul style="list-style-type: none"> The sad demise of Utah State University's OER initiative indicative of the precariousness of OER projects Extending strategies to provide an income stream for OER Raising funds to undertake OER research
Social	<ul style="list-style-type: none"> Absence of technical skills Unwillingness to share or give away intellectual property Unwillingness to use resources produced by someone else Assuring quality in open content 	<ul style="list-style-type: none"> Dealing with 'unwanted' outside contacts (MIT report 9%¹⁴) Lack of time devoted to producing shareable materials Research privileged over the development of teaching materials Lack of incentives Skills to select appropriate OER and re-use or re-mix it
Legal	<ul style="list-style-type: none"> Prohibition to use copyrighted material without consent Lack of awareness among academics regarding copyright issues 	<ul style="list-style-type: none"> Dealing with 3rd party copyright issues

* Summarised from OECD (2007:70); Hylén (2006:); Yuan et al. (2008)

What is clear from the above is that these anticipated challenges are still present in the OER movement and that additional challenges are emerging. However, a range of creative strategies are being employed by various OER initiatives to address these. The ensuing discussion will be restricted to issues of quality assurance and sustainability.

5.1 Specific challenge: Quality assurance

In general people remain suspicious about the quality of free resources (Wiley & Gurrell 2009) and seek reassurance about how the materials have been peer-reviewed. However the desire for a formal peer-review system is not universally supported. Instead the OER literature has revealed a range of QA strategies which ascribe the responsibility for quality to various agents. Using the concept of 'locus of control' ideas from the literature were classified into eight broad types of QA. This range of QA options was confirmed by the email survey responses to the question: *What*

¹⁴ http://ocw.mit.edu/ans7870/global/09_Eval_Summary.pdf

processes has your institution established to assure the quality of OER developed and shared by your institution? (Table 5).

Table 5: OER quality assurance – locus of responsibility

Locus of responsibility	Suggested in the literature	Adopted by those surveyed
Individual academic / contributor	<ul style="list-style-type: none"> • Pride-of-authorship (King & Baraniuk 2006:5) • Experts in their field (Fasimpaur 2010¹⁵) 	<ul style="list-style-type: none"> • MIT, JHSPH, UCT and Wits
Groups of other academics	<ul style="list-style-type: none"> • Peer review or vetting by subject area authorities (Larsen & Vincent-Lancrin 2005:17) • Volunteer group acting as an editorial board (Downes 2007:37) • Independent review (Friesen 2010:7) 	<ul style="list-style-type: none"> • Connexions
Users– both other academics as well as students	<ul style="list-style-type: none"> • User selection for use and re-use (Geser 2007:25) • User commentary or ranking (Larsen & Vincent-Lancrin 2005:17) • User community review (Geser 2007:21) • Collaborative filtering (Atkins, et al. 2007:30) • User feedback (Casserly 2007:18) 	<ul style="list-style-type: none"> • Open University, UK, Connexions, UCT • MIT
Institutional	<ul style="list-style-type: none"> • Branding or reputation (Atkins, et al 2007:30) • Internal quality control processes (Geser 2007:65) • History of the resource collection (Friesen 2010:7) 	<ul style="list-style-type: none"> • Open University, UK • OUNL
Across institutions	<ul style="list-style-type: none"> • Network of developers (Geser et al. 2007:21) • Cooperation among institutions (Geser et al. 2007:65) 	
Other institutions or organisations	<ul style="list-style-type: none"> • Recommender systems (Atkins et al. 2007:30; Wiley & Gurrell 2009:14) 	<ul style="list-style-type: none"> • Connexions (using the ‘lens’ system)
National bodies	<ul style="list-style-type: none"> • Policy makers (Wolfenden 2008:12) 	
International bodies	<ul style="list-style-type: none"> • Agreed framework of quality assurance and unit standards among countries (West 2007:39) 	

Comments from the survey suggest that responsibility for QA is clustered primarily around the pride-of-authorship models advanced by MIT, JHSPH and Wits and the institutional QA model supported by the OU and the OUNL. In addition, some institutions capitalise on Web 2.0 affordances and solicit user opinion. The most versatile QA mechanism is the ‘lens’ system which enables organisations and individuals to give their stamp of approval to content in the Connexions repository, allowing for a more sophisticated ‘external quality assurance’ process. This may be a way in which QA agencies could give their stamps of approval to OER.

At UCT the ‘pride-of-authorship model’ is currently being followed and materials are only moderated to check for potential third-party copyright infringements. Users are encouraged to rate the items on the University’s OpenContent site; this being the most democratic and inexpensive (albeit risky) QA process.

¹⁵ <http://www.k12opened.com/blog/archives/234>

5.2 Specific challenge: Financial sustainability

According to Martin Weller financial sustainability of OER is ‘the daddy of all the arguments’¹⁶. A range of potential OER sustainability models have been suggested in the seminal works of Downes (2007) and Wiley (2007). Their categorisations are used here to map the current range of practices being adopted by the institutions surveyed (Table 6).

Table 6: Financial sustainability models

Model*	Adopted by	Comment
Endowment	-	
Membership	<ul style="list-style-type: none"> OpenCourse ware Consortium Connexions Consortium 	<ul style="list-style-type: none"> The Connexions Consortium has about 18 members, but the numbers are growing. Dues range from \$2,500 - \$20 000 USD (Thierstein, Connexions)
Donations or Voluntary support	<ul style="list-style-type: none"> MIT - alumni 	<ul style="list-style-type: none"> Alumni have donated \$1.2 M in 3 major gifts. Additionally, we've received small gifts which in total are about to surpass \$500 K (from alum and non-alum donors) (Carson, MIT OCW)
Conversion	<ul style="list-style-type: none"> Connexions 	<ul style="list-style-type: none"> Connexions receives about 15% of the cost of books printed from the site
Contributor-Pay	-	
Sponsorship or corporate	<ul style="list-style-type: none"> Connexions 	<ul style="list-style-type: none"> Connexions had some corporate grants (Thierstein, Connexions)
Institutional	<ul style="list-style-type: none"> MIT, OU, JHSPH, OUNL, UCT 	<ul style="list-style-type: none"> MIT has also contributed about \$8M from the general institute budget and currently supports about half the annual cost. (Carson, MIT OCW) OpenLearn has been granted about £3 million to date of internal investment (Lane, OU)
Governmental	<ul style="list-style-type: none"> OU OUNL 	<ul style="list-style-type: none"> OpenLearn has received £3 million for 2009-2012 from a Government Agency (The Higher Education Funding Council for England) (Lane, OU) OUNL is one of the two partners of the national initiative Wikiwijs of the Ministry of Education which generates about EUR 1M per year (Schuwer, OUNL)
Partnerships and Exchanges		
Foundation	<ul style="list-style-type: none"> MIT, OU, JHSPH, OUNL, Connexions, UCT 	<ul style="list-style-type: none"> MIT has generated \$33M in external funding for the development of course materials over the past 9 years (Carson, MIT OCW) OpenLearn has received £4.65 million for 2006-2008 from the William and Flora Hewlett Foundation to date (Lane, OU) JHSPH OCW was initiated by a grant of \$834,000 from the Hewlett Foundations for a period of 4 years (Kanchanaraks, JHSPH)
Segmentation - “value-added” services	<ul style="list-style-type: none"> OUNL 	<ul style="list-style-type: none"> We are in the process of changing our business model from offering courses to offering services (Schuwer, OUNL)
Affiliate agreements	<ul style="list-style-type: none"> MIT agreement with Amazon.com 	<ul style="list-style-type: none"> Standard affiliate agreement with Amazon which nets us about \$40 K per year. Not huge, but money otherwise left on the table (Carson, MIT)

(*Adapted and extended from Downes 2007: 34-35; Wiley 2007: 16-17)

¹⁶ http://nogoodreason.typepad.co.uk/no_good_reason/2010/02/those-oer-issues.html

Analysis of the survey suggests that currently actual strategies adopted seem to cluster around external donor funding and internal institutional funding but are extending to include governmental funding, membership to consortia, donations from alumni and via affiliate agreements and the development of new service models.

At UCT the OpenContent project was initiated by a grant of R800,000 (about \$100,000) from the Shuttleworth Foundation. Support for maintaining the OpenContent directory has been integrated into the activities of the Centre for Educational Technology, but additional funds are being sought in order to have OER development grants for which individual or groups of academics may apply.

What is clear from each of the examples above is that institutions are adopting a mix of strategies, but are increasingly inclining towards institutional support and exploring additional strategies as seed-funding from donor foundations ceases to be a main strategy.

6. Ways forward

While it is essential to consider the quality assurance and financial sustainability issues, it is important not to lose sight of the heart of OER – the contributors and the users. We need to relate these quality assurance and financial sustainability issues to the ways we support educators' willingness to pay the opportunity cost entailed in developing and sharing OER.

6.1 Agency of individual academics

What is evident from the literature as well as the email survey is that the creation of OER is still based on the voluntary contribution of academics from HEIs even from large-scale OER initiative such as MIT OCW. There is evidence that at least some academics – who could be termed 'active agents' - have the sharing of their knowledge as one of their 'ultimate concerns' (Archer 2007) and have therefore deliberately elaborated a personal 'project' by finding time in their busy lives to think about what they would like to make available as OER and then using or acquiring the 'practices' (which could be related to technical options, licensing options, learning design options) they need to share their teaching resources. But academics have to make choices based on whether or not circumstances allow them to pursue their personal projects or persuade them to be more cautious and maintain the status quo. For example if salary increases, tenure, promotion, travel or grant awards are only related to research output, this may prompt academics to refrain developing materials that can be shared as OER. The process of developing OER – especially finding suitably open licensed graphics, open access readings, adding the metadata, etc – all takes time. Archer's theory suggests that even if academics have a genuine wish to share their materials, if these efforts are not valued by the institution, the academic as an 'active agent' may choose not pay the opportunity cost entailed in aspiring to their goal to create OER.

6.2 Policy issues for institutions, agencies and governments

In order to continue and enhance the support of these willing academics, institutions and governments need to consider ways in which they can support this embryonic practice, as resource development is still somewhat under valued in current HEI practice which generally privileges

research over teaching and values ways in which to optimise research as an income-generating activity. Academics in most HEIs are required to produce a stipulated number of 'research outputs' over a period of years; for which there are a range of support systems in place as well as set of procedures both internally and externally to fund, manage and monitor this process. The author has not found evidence of any equivalent existing for the production of OER except in the institutions such as the OU and OUNL which are distance education institutions.

What is suggested, however, is not a parallel process to the research process, but one that operates on the principle of supporting the academic to build their profile as educators and buttress their initiatives within an enabling environment that seeks to:

- Integrate the OER platform within the institutional infrastructure to provide a user-friendly technical environment with technical support and advice where academics can contribute directly with minimal QA hurdles;
- employ a range of funding strategies to be able to provide OER development grants in which academics either individually or collaboratively work with senior students (who are often tutors) to create 'born-open OER';
- provide legal support (particularly in terms of third-party copyright clearance) and advice; and
- acknowledge the OER contributions by academics as valued academic outputs for institutional processes such as salary increases, tenure, promotion, travel and grant awards.

7. Conclusion

While the OER movement has been spawned by generous seed-funding from a range of philanthropic foundations (the William and Flora Hewlett Foundation in particular), and built largely on the goodwill of contributing academics; in order to ensure sustainability and continued development, OER initiatives will need to become seamlessly integrated into institutional policies, structures and procedures. To support the current momentum these institutional policies, structures and procedures will need to be supportive of the academics and not be 'institution-centric' lest the spirit of openness be quashed by bureaucratic hurdles which have the potential to inhibit the emerging and still relatively fragile OER movement.

Further work in exploring the cost-saving potential and impact of OER on QA and concomitant factors such as throughput rates in institutions is required in order to understand the tangible impact of OER and shift this initiative from its peripheral status to a mainstream practice in 21st century pedagogy.

8. References

- Archer MS (2003) *Structure, Agency and the Internal Conversation*, Cambridge University Press, Cambridge.
- Archer, MS (2007) The trajectory of the morphogenetic approach: An account in the first person. *Sociologia Problemas e Praticas*, 54, 35-47.
- Baraniuk, R (2008) Challenges and opportunities for the open education movement: A Connexions case study. In Iiyoshi, T & Kumar, MSV (Eds) *Opening Up Education: The collective advancement of Education through Open Technology, Open Content, and Open Knowledge*. Cambridge, Massachusetts: The MIT Press. <http://www.ece.rice.edu/~richb/baraniuk-0262033712chap15.pdf> (Accessed 12 April 2010)
- Bauer, MW (2000) Classical content analysis: A review. In Bauer, MW & Gaskell (Eds) *Qualitative researching with text, image and sound*. Los Angeles: Sage.
- Carson, S (2009) The unwallied garden: growth of the OpenCourseWare Consortium, 2001–2008. *Open Learning: The Journal of Open and Distance Learning*, 24(1) 23-29. <http://www.informaworld.com/smpp/title~db=all~content=g909097565> (Accessed 12 April 2010)
- Casserly, C. (2007) The Economics of Open Educational Resources. In *Education Technology*. 47(6) 14-19.
- Córcoles C, Hornung-Prähauser V, Kalz M, Minguillón J, Ferran Ferrer N, Naust-Schulz, V and Schaffert S (2007) Introduction: PLAN of the use of Open Educational Resources (OER). http://www.olcos.org/cms/upload/docs/Introduction_en.pdf (Accessed 20 May 2008)
- D' Antoni, S (2007) Open Educational Resource and Open Content for Higher Education. *Revista de Universidad y Sociedad del Conocimiento*, año/vol. 4,número 001 Universitat Oberta de Catalunya Catalunya, España.
- D'Antoni, S (2009) Open Educational Resources: reviewing initiatives and issues, *Open Learning: The Journal of Open and Distance Learning*, 24(1): 3-10. Available online: http://pdfserve.informaworld.com/760653_909093141.pdf (Last accessed 22 March 2010)
- Downes S (2007) Models for sustainable open educational resources. *Interdisciplinary Journal of Knowledge and Learning Objects* 3: 29-44. <http://www.downes.ca/cgi-bin/page.cgi?post=33401> (Accessed 9 April 2010)
- Friesen, N. (2010) Using Free and Open Online Resources: Licensing and Collections. Available online: http://learningspaces.org/n/files/CC_Resources.pdf (30 March 2010)
- Geser G, Salzburg Research and EduMedia Group (2007) Open educational practices and resources: OLCOS Roadmap 2012. Open eLearning Content Observatory Services. http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf (Accessed 8 April 2010)

Hodgkinson-Williams, CA & Gray E (2009) Degrees of Openness: The emergence of open educational resources at the University of Cape Town. *International Journal of Education and Development using Information and Communication Technology*, Volume 5 Issue 5, pp 75-88.
<http://ijedict.dec.uwi.edu/search.php> (Accessed 9 April 2010)

Hylén, J (2006) Open educational resources: Opportunities and challenges. OECD-CERI. Available online: <http://www.oecd.org/dataoecd/5/47/37351085.pdf> (Accessed 23 March 2010)

Iiyoshi, T & Kumar, MSV (Eds) *Opening Up Education: The collective advancement of Education through Open Technology, Open Content, and Open Knowledge*. Cambridge, Massachusetts: The MIT Press.

Katz, R (Ed) (2008) *The Tower and the Cloud: Higher Education in the Age of Cloud Computing*. EDUCASE. <http://www.educause.edu/thetowerandthecloud> (Accessed 12 April 2010)

King WJ., Baraniuk, R. (2006) *Sharing Knowledge and Building Communities*. Rice University-February 2006. Available online: <http://cnx.org/aboutus/publications/ConnexionsWhitePaper.pdf> (30 March 2010)

Larsen, K. & Vincent-Lancrin, S. (2005) *The impact of ICT on tertiary education: Advances and Promises*. Washington: OECD/NSF/U <http://advancingknowledge.com/drafts/Larsen-The%20impact%20of%20ICT%20on%20tertiary%20education%20-%20AKKE.doc> (30 March 2010)

McAndrew P (2006) *Motivations for OpenLearn: the Open University's Open Content Initiative*. <http://kn.open.ac.uk/public/getfile.cfm?documentfileid=10026> (Accessed 8 April 2010)

McGill, L, Currier, S, Duncan, C & Douglas, P (2008) *Good intentions: improving the evidence based in support of sharing learning materials*. <http://ie-epository.jisc.ac.uk/265/1/goodintentionspublic.pdf> (Accessed 14 April 2010)

OECD (2007) *Giving Knowledge for Free: the Emergence of Open Educational Resources*, <http://tinyurl.com/62hvx6> (Accessed 4 February 2009).

Petrides, L, Nguyen, L, Jimes, C & Karaglani, A (2008) *Open educational resources: inquiring into author use and reuse*. *International Journal of Technology Enhanced Learning*, 1(1-2): 98-117.
<http://inderscience.metapress.com/media/87exf5a92p7jwkb15g86/contributions/9/4/2/8/9428665670616423.pdf> (Accessed 11 April 2010)

UNESCO (2002). *UNESCO Promotes New Initiative for Free Educational Resources on the Internet*. http://www.unesco.org/education/news_en/080702_free_edu_ress.shtml (Accessed 8 April 2010)

West, P. (2007) *The Virtual University Becomes a Reality*. *Education Technology*, 47(6) 38-41.

Wiley, D & Gurrell, S (2009) *A decade of development ...*, *Open Learning: The Journal of Open and Distance Learning*, 24(1): 11-21. http://pdfserve.informaworld.com/436010_909097159.pdf (Accessed 22 March 2010)

Wiley, D (2007) On the Sustainability of Open Educational Resource Initiatives in Higher Education. Paper commissioned by the OECD's Centre for Educational Research and Innovation (CERI) for the project on Open Educational Resources. Available online <http://www.oecd.org/dataoecd/33/9/38645447.pdf> (Accessed 22 March 2010)

Wolfenden, F. (2008) The TESSA OER Experience: Building sustainable models of production and user implementation. Journal of Interactive Media in Education. <http://jime.open.ac.uk/2008/03/> (Last accessed 30 March 2010)

Yuan, L, MacNeill, S and Kraan W (2008) Open Educational Resources – Opportunities and Challenges for Higher Education. JISC CETIS. http://learn.creativecommons.org/wp-content/uploads/2008/09/oer_briefing_paper.pdf (Accessed 10 April 2010)

Appendix A: Email survey and respondents

Email survey questions posed:

1. In the light of your experience, how well has the development and sharing of OER improved the quality of teaching and learning materials at your institution? (How is it possible to tell this?)
2. What processes has your institution established to assure the quality of OER developed and shared by your institution?
3. How has your institution's OER initiative been funded to-date? (If possible it would be useful to know approximately how much and over what period of time you institution has received funding from donor agencies/government/alumni/commercial organizations etc.)
4. In the light of your experience has OER assisted in generating additional funding for your institution and if so can this be quantified?

Consent for use of data:

The responses to these questions can be associated directly with you OR aggregated with response from other respondents.

Please will you indicate below which approach you would prefer:

- 1) My responses to these question can be directly attributed to me
- 2) Aggregated with other responses from OER champions

Respondents

Respondent	Institution	Type of institution
Steve Carson	OpenCourseware Project, MIT	Traditional campus-based
Sukon Kanchanaraksa	Johns Hopkins Bloomberg School of Public Health	Traditional campus-based
Derek Keats	University of the Witwatersrand (WITS)	Traditional campus-based
Andy Lane	Open University (OU)	Distance education institution
Robert Schuwer	Open Universiteit Nederland (OUNL)	Distance education institution
Joel Thierstein	Connexions, Rice University	Traditional campus-based

Link to data and analysis: <https://vula.uct.ac.za/portal/site/c10812f1-b2e6-4286-bfaa-c822c5a22b25/page/d28f624f-d897-4ed1-8140-2969e8810b85>