

## Degrees of ease: adoption of OER, open textbooks and MOOCs in the Global South

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# Degrees of Ease: Adoption of OER, Open Textbooks and MOOCs in the Global South

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## Abstract

*Internationally, education institutions are under a great deal of pressure to provide rising numbers of students with access to quality education in increasingly economically constrained environments. For some time now, the affordances provided by the internet have enabled a range of educational activities to be supported digitally or conducted online. Three fairly new forms of web-enabled activities that are receiving attention are Open Educational Resources (OER), Open Textbooks, and Massive Open Online Courses (MOOCs). OERs and Open Textbooks have been hailed as a response to the demand for provision of flexible and cost-effective learning materials, while MOOCs have been touted as an answer to the provision of up-to-date and cost-effective tuition for growing numbers of students in so-called 'developing countries', or what I shall refer to as the Global South. This paper will offer a definition of these forms of teaching provision and learning support within the context of "Open Education" and identify the key activities underlying OER, OpenTextbooks and MOOCs. It will interrogate the factors that seem to influence the ease with which educators and students in the Global South can contribute to or adapt existing materials and/or tuition to suit their contexts as a way to avoid any possible "neo-colonization and one-way flow of content based on the massive amount of content published by those in richer nations" (Amiel 2013: 127).*

## Introduction

Internationally, education institutions are under a great deal of pressure to provide students with access to quality education in progressively economically constrained environments in all the sectors from primary and secondary through tertiary to what is termed lifelong learning. Despite some successes towards achieving Education for All (EFA), education agendas will remain unfinished by 2015 and unequal access to higher education is likely to persist (UNESCO 2014b). While the cost of tuition is increasing, enrolments are outstripping funding and HEIs have to cope with decreasing financial support from governments (Yang & McCall 2014). In addition, state institutions responsible for procuring school textbooks, as well as university libraries and students, are facing the dual challenge of the increasing cost of scholarly resources including books, articles and textbooks during a time of rapid knowledge development and subsequent need for adapting course content to keep pace with change.

Within these economically straitened times, HEIs in some parts of the Global North are increasingly facing the challenge of declining numbers of students in higher education (for example in the UK (Higher Education Funding Council for Education (HEFCE, 2014) as well as increasing student numbers. HEIs in the Global South ("a shorthand for the world of non-European, postcolonial

peoples” Comaroff and Comaroff 2012:113) also face the challenges of increasing student numbers (UNESCO 2014a) just on a larger scale. Both the Global North and Global South have a need to provide the best quality tuition and associated materials so that the students may access up-to-date and relevant knowledge and skills (such as those recommended by the recent UNESCO *Position Paper on Education Post-2015*) to be employable and to reach their own life goals.

For some time now, the affordances provided by the internet have enabled a range of educational activities to be supported digitally or conducted online, irrespective of time, place or learner preparedness. While some of the provision has been provided by home schooling, private colleges and private HEIs, an “Open Education” movement is emerging which offers an alternative to the traditional educational resourcing within the educational landscape. As Tuomi points out:

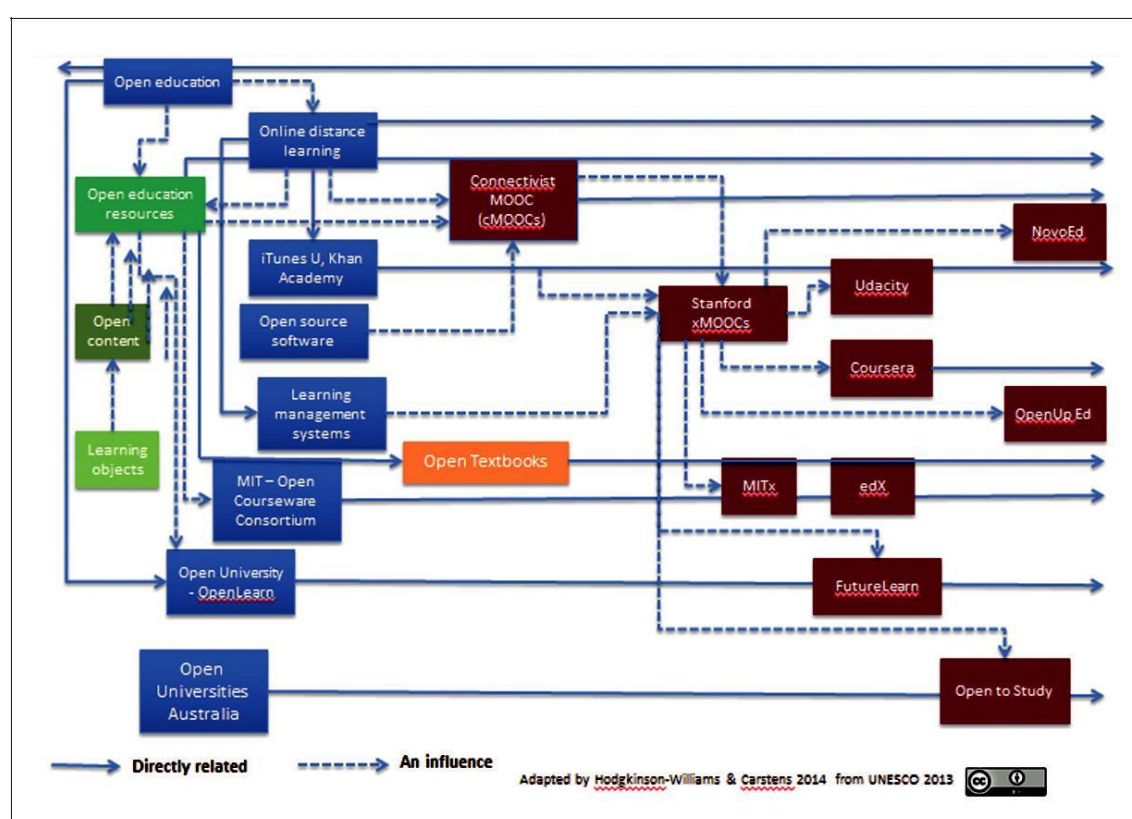
The rapid expansion of social media applications occurs because there are few technical obstacles to overcome. As Internet infrastructures have matured to a point where massive numbers of users can be supported at extremely low costs, the speed of technology diffusion is now limited by the users (Tuomi 2013: 58).

Although “online open education resource (OER) repositories are burgeoning in the global North” (Oates 2009:1), this is not yet the case in the Global South. While we have limited evidence about exactly how those in the Global South are creating and using OER and what impact this is having on student performance, we do know that we have to make this adoption process easier (Amiel 2013). Open Textbooks are emerging as a response to the increasing costs in Global North contexts (Allen & Student PIRGs 2010) and as a response to expensive textbooks and consistent shortages of up-to-date textbooks in the Global South (Cartmill 2013; Dlodlo & Foko 2012). The emergence of Massive Open Online Courses (MOOCs) “represents the latest stage in the evolution of open educational resources” and according to (Mazoue 2013) are “opening up a path to credit for free and low-cost courses”. However, in reality most of the MOOCs so not offer a direct pathway to accreditation as they as they seem to be protecting their fee generating accreditation process. Although they are touted as being able to “democratize education” (Mazoue 2013), MOOCs are, at the time of writing, a predominantly Global North phenomenon.

This paper will offer a definition of these forms of learning within the context of “Open Education” and identify the key practices underlying OER, OpenTextbooks and MOOCs. It will interrogate the different factors that seem to influence the ease with which educators and students in the Global South can both create and customise content to suit their contexts as a way to avoid a possible “neo-colonization and one-way flow of content based on the massive amount of content published by those in richer nations” (Amiel 2013: 127). What Ngugi says of Africa is applicable to the rest of the Global South: “Africans must play an active role as producers of knowledge within the global economy” (2011:281) or forever remain a colonized people.

## Emergence of OER, Open Textbooks and MOOCs

Historically, the Open Education phenomenon started with the various open universities offering access to those who did not necessarily qualify for entry into undergraduate courses. More recently, the emerging Open Education movement is extending its remit beyond access, promoting the idea that “everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint” (Cape Town Open Education Declaration 2007<sup>1</sup>). The qualifier “open” now refers to more than open entry; it includes the sharing of resources including open educational resources and open textbooks as well as open educational practices and programmes such as Massive Open Online Courses (MOOCs)<sup>2</sup> (Figure 1).



**Figure 1** Timeline of Learning Objects, OER, OpenTextbooks and MOOCs (Adapted from UNESCO (2013:3); Yuan & Powell (2013:6))

<sup>1</sup><http://www.capetowndeclaration.org/read-the-declaration>

<sup>2</sup>[http://en.wikipedia.org/wiki/Massive\\_open\\_online\\_course](http://en.wikipedia.org/wiki/Massive_open_online_course)

## Precursor of OER Learning Objects

Historically, OER emerged from the idea of “learning objects”, a term credited to Wayne Hodgins when he created a working group in 1994 bearing the name, although the concept was first described by Gerard as far back as 1967<sup>3</sup>. A learning object can be described as a collection of content items, practice items and assessment items that are combined based on a single learning objective<sup>4</sup>. The idea that online materials could be designed to allow easy reuse in a wide range of teaching and learning situations attracted interest from educators.

Hodgins (2004) conceptualised a range of reusability options based on a gradation from the most specific **media element** or “objects” (e.g. an illustration, an image), through to more integrated “**information objects**” (e.g. procedure, principle, concept, process, fact, overview, summary) and then onto “**application objects**” that linked these various procedures, principles, concepts, processes and facts to meet an initial “enabling objective”, and then aggregating these application objects as “**Lessons**” and finally to “**Courses**” Hodgins extended his diagram in 2010 and changed the title from “Modular Content Hierarchy” to “Universal Object Model”<sup>5</sup> and included a reference to the “Skills Object” which include Task, Skills, Ability, Tools, Software, Knowledge, Resources and Performance standard.

Hodgins(2004) identifies the individual media elements as being the most reuseable and most context independent on a continuum, while the aggregated courses are the least reusable and the most context dependent.

Wiley critiqued the “learning object” notion in his 2001 online paper entitled the “The Reusability Paradox”, in which he describes the fundamental contextual paradox of reusing materials:

The purpose of learning objects and their reality seem to be at odds with one another. On the one hand, the smaller designers create their learning objects, the more reusable those objects will be. On the other hand, the smaller learning objects are, the more likely it is that only humans will be able to assemble them into meaningful instruction. From the traditional instruction point of view, the higher-level reusability of small objects does not scale well to large numbers of students (i.e., it requires teachers or instructional designers to intervene), meaning that the supposed economic advantage of reusable learning objects has evaporated (Wiley 2001).

Wiley’s (2001) suggestion was to either “encourage the development and use of only large objects, settling for their limited reusability” by educators or to create “learning environments in which learners interact directly with the small objects, manipulating and combining them” to construct meaning for themselves”. In 1998 Wiley had suggested a new term, “open content”, which included a licensing arrangement, the Open Content Licence which drew heavily on the existing “Open Source Software” licence, the General Public Licence (GPL) to enable openness of educational materials

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<sup>3</sup>[http://en.wikipedia.org/wiki/Learning\\_object](http://en.wikipedia.org/wiki/Learning_object)

<sup>4</sup>[http://en.wikipedia.org/wiki/Learning\\_object](http://en.wikipedia.org/wiki/Learning_object)

<sup>5</sup>[http://www.slideshare.net/01415038/savedfiles?s\\_title=snowflaked-mashups-future-of-learning-content&user\\_login=WayneH](http://www.slideshare.net/01415038/savedfiles?s_title=snowflaked-mashups-future-of-learning-content&user_login=WayneH)

(Wiley & Gurrell 2009). In 1999 Wiley and colleagues released a new Open Publication Licence that “required users to attribute the original author(s), and included additional clauses that a licensor could opt to invoke” (Wiley & Gurrell 2009:13). This development was the precursor to the Creative Commons (CC) licences which made the clauses easier to understand and select (Wiley & Gurrell 2009). These open licenses and tools forge a balance inside the traditional “all rights reserved” setting that copyright law creates. These CC Licenses provide creators a simple, standardized way to grant permissions to their creative work indicating how content can be copied, distributed, edited, remixed and built upon legally<sup>6</sup>.

## Emergence of OER

Although Wiley suggested the term “open content” (Wiley 1998), simultaneous open practices around the world resulted in a number of other terms being used, including “open resources”, “digital learning resources” (Littlejohn, Falconer & McGill 2008), “reusable digital learning resources” (Leacock and Nesbit 2007), “open-sourced content”<sup>7</sup> and “open source resources”. In 2002, UNESCO’s Forum on the Impact of Open Courseware for Higher Education in Developing Countries brought together many different organisations engaged in creating, sharing and reusing educational materials, and coined the term “Open Educational Resources” to describe educational content that is openly available, licensed in such a way as to promote a range of re-use options.

Although the Connexions non-profit start-up was launched at Rice University in 1999<sup>8</sup>, MIT is usually credited with spearheading OER worldwide with their “Open CourseWare” (OCWC) initiative and thereby adding another term to the mix.

Definitions of OER have developed over time, and perhaps the most comprehensive version is the one offered by the William and Flora Hewlett Foundation:

OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge<sup>9</sup>.

In short, existing materials can be converted into OER by the original authors as a type of “self-reuse,” or authors can create materials with the intention to share right from the beginning as others have referred to as developing OER “from scratch” (Schuwer, Lane, Counotte-Potman & Wilson (2011) or what we refer to as “born open” OER. Others can take these original materials and copy them “as is” what Wiley, Green and Soares (2012:2) refer to as “Re-use” or they can “Revise” them or “Remix” them and then “Redistribute” them. This is what Wiley, Green and Soares (2012:2) refer to as the “4Rs”.

<sup>6</sup><https://creativecommons.org>

<sup>7</sup>[http://en.wikipedia.org/wiki/California\\_Open\\_Source\\_Textbook\\_Project](http://en.wikipedia.org/wiki/California_Open_Source_Textbook_Project)

<sup>8</sup><http://cnx.org/aboutus/faq>

<sup>9</sup><http://www.hewlett.org/programs/education/open-educational-resources>

Okada et al. (2012) elaborated upon the “4Rs” concept, providing a useful starting point for understanding the complexities of reusability. They posit four levels of reusability with 12 variations of ways of reusing OER within four main types of activity namely: (1) Recreate content & contribute to new productions; (2) Adapt part of the content; (3) Adopt same content, but adapt structure, format, interface or language; (4) Adopt same content (whole, part or combination). Although the combination of these two frameworks creates a very useful way of describing different types of OER re-use, there are two key aspects that need to be included to complete the entire cycle, namely the creation by the original author and the curation or storage of the materials. In the OER Handbook for Educators 2009,<sup>10</sup> the “create” step is also referred to as “compose”. The curation or storage of the materials is similar to what Wiley recently termed “Retain” the right to make, own, and control copies of the content (5 March 2014<sup>11</sup>), but specifically includes the adding of a license and descriptive metadata. White and Manton use the “5 D” heuristic “deciding, discovering, discerning, designing and delivering” (2011: 10 – 14).

## Emergence of Open Textbooks

Spearheaded by student projects such as the Student Public Interest Research Groups (PIRGs)<sup>12</sup>, new start-ups such as Flat World Knowledge<sup>13</sup>, the Community College Consortium for OER (CCCCOER)<sup>14</sup> and OER platforms such as Connexions and MERLOT in the USA, the Open Textbook movement has initiated new ways of writing, editing, publishing and using textbooks in an openly licensed and flexible manner. In contrast to traditional textbooks, Open Textbooks have open licenses so educators are free to adapt any portion of a textbook without requiring students to purchase an entire book only to use a small portion<sup>15</sup>. The definition of Open Textbooks by Wikipedia seems to be the most encompassing at the moment and reads as follows:

An Open Textbook is a textbook licensed under an open copyright license and made available online to be freely used by students, teachers and members of the public. Many open textbooks are distributed in either print, e-book, or audio formats that may be downloaded or purchased at little or no cost<sup>16</sup>.

There are also school-focused Open Textbook projects such as Siyavula<sup>17</sup> (formally the Free High School Science Texts) in South Africa and the Utah Open Textbook Project<sup>18</sup>. This year two Open Textbook initiatives in Canada and Poland released their first Open Textbooks under Creative Commons licenses<sup>19</sup>, although not quite the “world’s first” as this news report claims.

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<sup>10</sup>[http://wikieducator.org/OER\\_Cycle\\_%28straw\\_dog%29](http://wikieducator.org/OER_Cycle_%28straw_dog%29)

<sup>11</sup><http://opencontent.org/blog/archives/3221>

<sup>12</sup><http://studentpirgs.org/page/sp/our-mission>

<sup>13</sup><http://catalog.flatworldknowledge.com/>

<sup>14</sup><http://oerconsortium.org/> <sup>15</sup><http://bccampus.ca/2012/10/29/questions-and-answers-on-open-textbooks-part-1a/>

<sup>16</sup>[http://en.wikipedia.org/wiki/Open\\_textbook](http://en.wikipedia.org/wiki/Open_textbook)

<sup>17</sup><http://www.siyavula.com/>

<sup>18</sup><http://utahopentextbooks.org/> <sup>19</sup><http://www.openeducationeuropa.eu/en/news/worlds-first-open-textbooks-released-same-month-different-continents>

Apart from the flexibility of using only a portion of an up-to-date Open Textbook or customising the content to suit local requirements, the greatest benefit that Open Textbooks provide is possible cost reduction. Cost-savings have already been established in some studies in the US (Hilton, Robinson, Wiley & Ackerman 2014), but further research is required in the Global South.

## **Emergence of MOOCs**

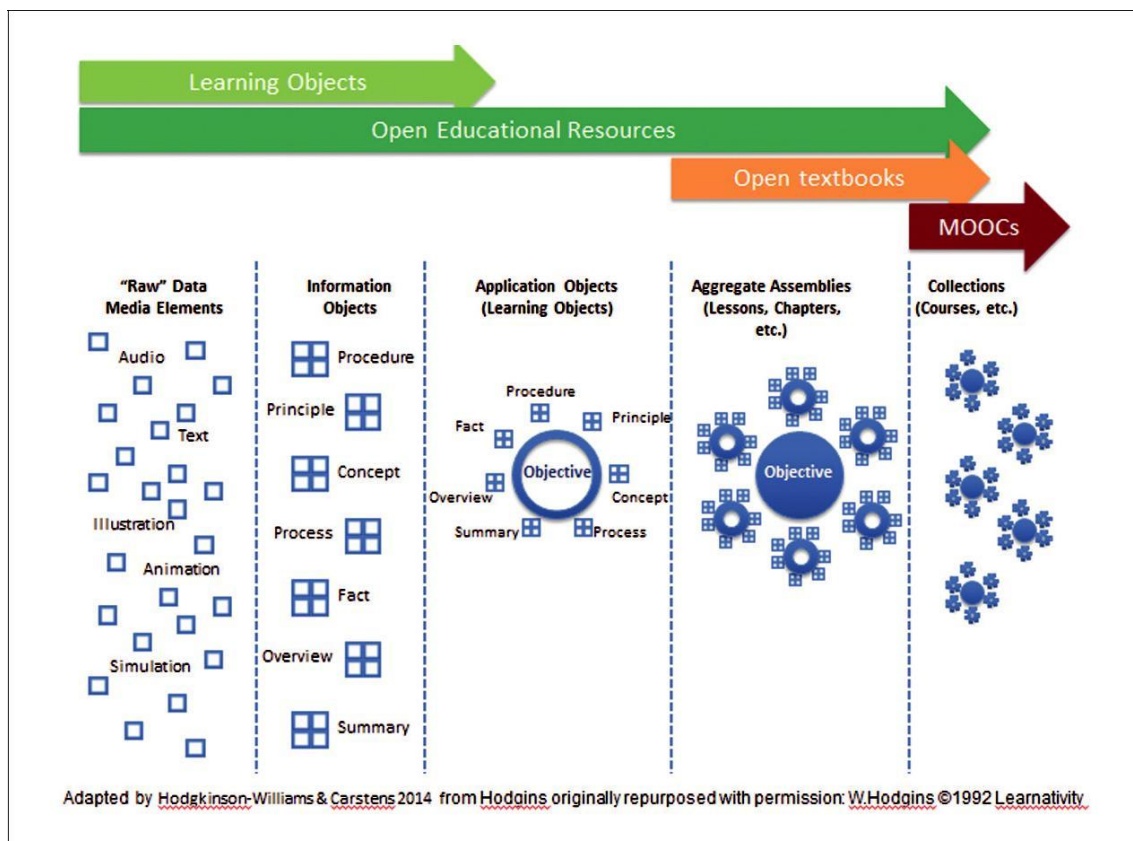
The first recorded MOOC, the “Connectivism and Connective Knowledge” course, was led by George Siemens of Athabasca University and Stephen Downes of the National Research Council in 2008[1]. Since then, the interest in MOOCs has sparked the interest of students, lecturers, education institution management as well as venture capitalists. Possible benefits for various groups seemed to include easy access to tuition for students, potential ways for lecturers to either mount their own MOOC or use existing MOOCs in a wrap-round fashion as well as yield potential commercial benefits educational institutions and venture capitalists.

The initial MOOC concept has spawned a number of varieties that now include some that may be open for entry, but are not open in terms of reuse of materials. The latter have been referred to as xMOOCs and the former as connectivist-MOOCs or cMOOCs (Rodriguez 2013). As Diana Laurillard noted in a private email to a student: “MOOCs have muddied the OER waters”, making it difficult for students, lecturers and members of the public to know what materials they are allowed to re-use or not.



## The Open Education Trajectory: Learning Objects, OER, Open Textbooks and MOOCs

As a way to more easily conceptualise the range of open initiatives, an extensively reworked version of Hodgins' Modular Content Hierarchy (2004: 78) is presented below (Figure 2).



**Figure 2** Learning Objects, OER, Open Textbooks and MOOCs (inspired by Hodgins (2004: 78) and Hodgins (2013<sup>20</sup>))

While the figure above provides some sense of the chronological development of the Open Education movement, it does not yet help us to understand the various processes that might underpin the adoption of Open Education and how they might differ.

<sup>20</sup><http://www.slideshare.net/WayneH>

## Open Education Cycle

Apart from White and Manton (2011), Okada et al. (2012) and Wiley et al. (2014), there are a number of other conceptions of the OER cycle, for example Pawlowski 2008<sup>21</sup>, OER Handbook for Educators 2009<sup>22</sup>, OLnet 2010<sup>23</sup> and very detailed workflow at the Open University (Schuwer, Lane, Counotte-Potman & Wilson (2011)). In an endeavour to make the Open Education process as easily understandable as possible, an adapted Open Education cycle is proposed that starts with conceptualisation and creation, rather than assuming these stages as is evident in Wiley et al.'s (2012:2) "4Rs" but closer to White and Manton's (2011) stage of "deciding".

The *conceptualization* phase includes the curriculum planning of what exactly is needed for whom before a decision is made to create, copy, customise or combine materials and/or tuition. The *creation* phase refers to the development of original materials and/or tuition by the author or institution either as a "self-use" of existing materials or "born open" OE, i.e. developed with the view of being shared freely and openly. The *curation* of the materials and/or tuition refers to the hosting of these on a publically accessible platform that includes sufficient descriptive information (i.e. metadata) and appropriate open licensing (e.g. Creative Commons) for the OE to be easily found and *circulated* so that it can be easily discovered (artificially referred to as "*loCate*" in this cycle) and then *copied*, *customised* or *combined* with other content or processes according to the open licence that the original author or institution selected. As the use of Open Education materials or processes may allow for some kind of accreditation, informally or formally, the term "*certify*" has been used to prompt thinking about the possible consequences for the completion of Open Education materials and/or tuition. A final stage of evaluation, as suggested by the OLnet project, is included (also slightly artificially as "*critique*") so that this forms a relatively easy 10C heuristic of the OE cycle (Table 1). Synonyms or similar terms are added in brackets beneath the key process terms, e.g. "conceptualise" could be referred to as "plan".

Process	OLnet 2010	Wiley (2014)	White & Manton (2011)	Okada (2012)
<b>Conceptualise</b> (plan, propose, imagine)			deciding	
<b>Create</b> (develop, produce, make)	design	–	–	–
<b>Curate</b> (add licence, metadata & store)	–	Retain - make, own, and control copies of the content	–	–

<sup>21</sup><http://users.jyu.fi/~japawlow/OERLifecycle.gif>

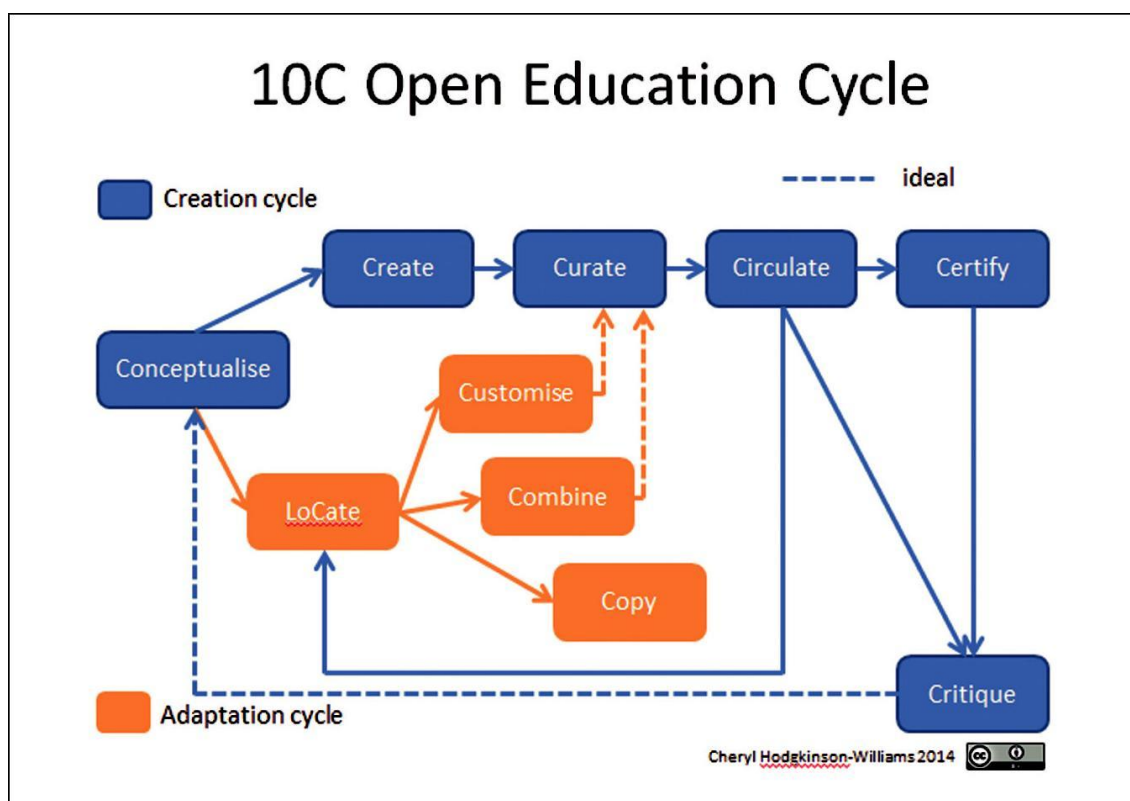
<sup>22</sup>[http://wikieducator.org/OER\\_Cycle\\_%28straw\\_dog%29](http://wikieducator.org/OER_Cycle_%28straw_dog%29)

<sup>23</sup><http://www.open.ac.uk/wikis/iet/File:Diagram1.jpg>

<b>Circulate</b> (host on public platform/s)	–	Redistribute - share copies of the original content, your revisions, or your remixes with others	delivering	–
<b>LoCate</b> (find, choose)	select	–	discovering, discerning	–
<b>Customise</b> (edit, translate, localise)	(design)	Revise adapt, adjust, modify, or alter the content itself	designing	re-authoring, contextualising, re-designing, summarising, repurposing, translating, personalising, re-sequencing
<b>Combine</b> (mix, group, mash-up)	–	Remix combine the original or revised content with other open content to create something new	–	decomposing, re-mixing and/or assembling
<b>Certify</b> (award, accredit)				
<b>Critique</b> (reflect, judge)	evaluate	–	–	–

**Table 1** 10C Open Education Cycle comparison

Visually this process can be illustrated as follows (Figure 3)



**Figure 3** 10C Open Education Adoption Cycle

While this cycle provides a process for mapping the OE adoption cycle, it does not highlight the ease of adoption factors that need to be taken into account and how these might make the process of OE adoption easy or difficult.

## Factors Influencing the Degrees of Ease in Adopting Open Education

To assist in identifying the criteria that need to be considered in this process, a conceptual framework is offered that endeavours to identify the factors that might influence the “degrees of ease” with which various “open” materials and/or processes can be adopted. It is based on prior work on the “degrees of openness” (Hodgkinson-Williams & Gray 2009) and in-house presentations (Hodgkinson-Williams & Czerniewicz 2014).

The conceptual framework consists of 5 dimensions, including: (1) technical openness; (2) legal openness; (3) cultural openness; (4) pedagogical openness and (5) financial openness.

In 2009, Eve Gray and I presented a four-part framework for understanding the degrees of openness in OER, namely “social openness”, “technical openness”, “legal openness” and “financial openness” (Hodgkinson-Williams & Gray 2009). While these elements are still attributes of openness and the

continuum of openness for these elements still holds, an elaboration of the “social openness” is called for as it conflated far too many issues under one broad label and these need to be disaggregated in order to be more helpful criteria. But for the sake of completeness all of the attributes will be described.

## Technical Openness

In the process of developing a Portuguese web-based booklet on OER for schoolteachers via OER, Amiel “found that technical issues, particularly concerning the use of open standards and editable sources, to be of the essence. Without attention to these technical concerns the collaborative and participatory practices of remix can be cumbersome and problematic” (2013:139). There are a number of technical factors that may influence the ease with which Open Education materials and/or tuition can be contributed to or changed. These include the (1) interoperability and open formats; (2) technical skills and equipment; and (3) availability and discoverability.

### Interoperability & open formats

Tuomi notes that “technical interoperability standards make it possible for independently developed systems to interact and co-exist” (2006:9) and highlights that these technical interoperability standards can be either proprietary or use open source software (OSS). Heinze et al. helpfully defined “technical openness” as the use of resource formats which are easy to open and modify in any software, thereby allowing for interoperability” (2014:3). In practice this means that even though open file formats can be implemented by both proprietary and OSS,<sup>24</sup> certain open formats are not as easy to modify

as others. For example, a Portable Document Format (pdf) is easy for “re-use as is”, but not as easy to modify (ie. for revising or re-mixing) as an OpenDocument text (odt). So despite there being two fairly distinct open and closed formats, in terms of technical openness of any open material can be placed somewhere on the continuum between the closed formats and the most accommodating open formats. Amiel suggests that “providing files in open formats substantially enhances the possibility that minority groups can adequately remix resources through free and open software” (2013:139).

### Technical skills & resources

While educators may have the technical skills required for creating or re-creating a presentation as an OER, it is less likely that they would possess the skills and/or equipment to produce a series of high-quality videos as part of a MOOC. Technical competence needs to be matched with resource availability to encourage Open Education. Resources also refer to connectivity and its costs. While this may be less of a problem in the Global North, it is still a problem in the Global South.

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<sup>24</sup>[http://en.wikipedia.org/wiki/Open\\_format](http://en.wikipedia.org/wiki/Open_format)

## Availability and discoverability

The re-use of any open content is premised on its availability and by implication on its discoverability. This in turn means that not only the original version of the open content needs to be available to the public, but so does the derivative content the revised or re-mixed content. Despite the many institutional repositories, aggregators (such as MERLOT<sup>25</sup>, OER Commons<sup>26</sup>, Class Central<sup>27</sup>, making reworked content available is not always that easy in terms of hosting and the use of descriptive metadata to make it easy to locate. There are some exceptions though and these include OpenStax<sup>28</sup> (formerly Connexions) and OpenTapestry.<sup>29</sup>

Interoperability & Formats	.....Closed	Open
Technical skills & resources	Little or no competence..... Few resources..... No or limited affordable connectivity.....	Competent Well-resourced Inexpensive connectivity
Availability & discoverability	Personal storage..... Opaque.....	Public repository Clear

In summary, plotting these technical factors against Open Education processes provides some idea at least graphically at this point as to the degree of ease for contributing to or changing Open Education materials and/or tuition (**Table 3**). This framework would need to be applied in a specific context to be a useful indicator of potential constraints in Open Education processes.

Process	Technical factors	Degree of ease
Conceptualise		
Create	Interoperability & Formats	Closed..... Open
	Technical skills & equipment	Little or no competence..... Competent Few resources..... Well-resourced
Curate	Availability	Personal storage..... Public repository
Circulate	Availability	Personal storage..... Public repository
LoCate	Availability & discoverability	Opaque..... Clear
Copy		
Customise	Interoperability & Formats	Closed..... Open

<sup>25</sup><http://www.merlot.org/merlot/index.htm>

<sup>26</sup><http://www.oercommons.org/>

<sup>27</sup><https://www.class-central.com/>

<sup>28</sup><http://cnx.org/>







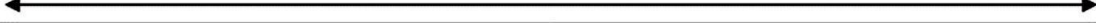
<sup>29</sup><http://www.opentapestry.com/>

	Technical skills & equipment	.....Little or no competence Few resources.....	Competent Well-resourced
Combine	Interoperability & Formats	Closed.....	Open
	Technical skills & equipment	Little or no competence..... Few resources.....	Competent Well-resourced
Certify			
Critique			

**Table 3** Technical openness and degrees of ease in Open Education processes

## Legal Openness

In terms of intellectual property rights, there are a 'spectrum of rights' from locked-down copyrighted materials through a range of flexible licenses offered by Creative Commons or the GNU Free Documentation License, to public domain materials. Creative Commons offers the producer and end user the ability to make their choices on three key concepts: attribution, derivation and commercial usage. Based on a combination of these three elements there are six different kinds of licenses (**Figure 4**).

Copyright	Creative Commons Licences						Public domain
All rights reserved	Attribution Non-commercial No derivatives	Attribution Non-commercial Share Alike	Attribution Non-commercial	Attribution No Derivatives	Attribution Share Alike	Attribution	No rights reserved
							
Suitable file formats	PDF, password protected document file					Wiki, xml, ODF, html	
<div style="text-align: center;">  </div>							
Most restrictive				Most accommodating			
<b>BY = Attribution</b>		<b>NC = Non-commercial</b>		<b>ND = No derivatives</b>		<b>SA = Share Alike</b>	

**Figure 4** Continuum of legal openness in Creative Commons (Hodgkinson-Williams & Gray 2009: 109)

Paul Stacey (2010) has produced a much more sophisticated diagram that illustrates more than the Creative Commons licensing framework and also plots this against various OER initiatives.

## Open licensing knowledge

Amiel (2013) points out some of the legal challenges facing possible creators or remixers of OER, including the situation where resources, using more open licenses (e.g. attribution only), incorporate or refer to media that are made available using more restrictive licenses (e.g. no derivatives). The challenge is how well-informed creators and re-creators are of the various licensing options (**Table 4**).

Amiel concludes that “issues of licensing led us to make complex choices in defining what to use and how to remix resources. Attribution can become a complex task as issues of authorship are on shifting ground” (2013: 139).

## Open licensing advice

While licensing an individual text-based presentation is relatively easy, the minute that graphics, music and video are included the licensing options may become more complex. Although the Creative Commons website has endeavoured to make this as easy as possible, there is sometimes a genuine need for legal advice on dealing with some of the more complex resources. Some institutions have access to lawyers who are familiar with alternative intellectual property mechanisms, but anecdotally this still seems to be a constraint in the Global South. Future research will hopefully shed some light on this aspect (e.g. Research on Open Educational Resources for Development (ROER4D) Project<sup>30</sup>)

Open licensing knowledge	Well-informed
Open licensing advice	No legal advice available..... Legal advice available & supportive of open licensing

**Table 4** Legal openness

Process	Legal factors	Degree of ease
<b>Conceptualise</b>		
<b>Create</b>	Open licensing knowledge	Most restrictive ..... Most accommodative
	Open licensing advice	No legal advice available ..... Legal advice available
<b>Curate</b>	Open licensing	Most restrictive ..... Most accommodative
<b>Circulate</b>		
<b>LoCate</b>		
<b>Copy</b>		
<b>Customise</b>		
<b>Combine</b>	Open licensing Open licensing advice	Most restrictive ..... Most accommodative No legal advice available ..... Legal advice available
<b>Certify</b>		
<b>Critique</b>		

**Table 5** Legal openness and degrees of ease in Open Education processes

<sup>30</sup> roer4d.org



## Cultural Openness

Although we did refer to a range of pedagogies within “social openness” in the 2009 paper (Hodgkinson-Williams & Gray 2009), it included too many issues under one broad label and these need to be disaggregated in order to be more helpful criteria. Three separate categories, namely “cultural openness”, “pedagogical openness” and “organisational openness” replace the original social openness. The first of these, and by far the most problematic, is the cultural openness which includes knowledge.

## Knowledge

Although “information communication technologies are heralded as democratizing the creation of knowledge and allowing anyone with Internet access to have ‘all the world’s knowledge at their fingertips (Friedman 2005:178) ... knowledge is treated as having no inner structures with properties, powers and tendencies of [its] own, as if all forms of knowledge are identical, homogenous and neutral” (Maton 2014:2). Instead we need to be mindful of “what constitutes knowledge [and] who produces knowledge” (Amiel 2013: 140) lest the Global South becomes a mere re-user of knowledge from the Global North and fails to take advantage of the technical and legal affordances that have made sharing of knowledge relatively easy and thereby forfeit the opportunity to develop and share “local knowledge and indigenous ways of knowing” (Amiel 2013: 136). In a discussion of knowledge and education, Michael Young states:

If subject areas or disciplinary areas have some consensus around what constitutes “knowledge”, then combining different OER or even Open Textbooks is not too problematic. However, the more disagreement there is around what is deemed to be “knowledge”, the more complex the combination of various OER becomes.

## Curriculum

In some of the OER literature, the concepts of “knowledge” and “curriculum” seem to be conflated (e.g. OECD 2007), but “knowledge gets turned into a curriculum” (Luckett 2009:442) and this “recontextualisation of disciplinary knowledge into a curriculum [is] informed by social interests and relations” (ibid.) which might differ depending on the particular course, the student needs and even educator preferences. What is deemed to be valuable for students to learn is sometimes not decided by an autonomous individual educator, but by government or institutional curriculum developers. This may directly influence the choices educators make with respect to Open Education. As Michael Young asks:

What principles should underpin the curriculum of the future? ... Answers to... [such]... questions will depend, at least in part, on the assumptions that are made about the nature of knowledge, and how the knowledge on which the curriculum is based is assumed to differ from the ‘everyday’ knowledge of communities and workplaces. (2003:99)

The “remix” affordance of OER permits the articulation of the local ‘everyday’ knowledge as well as the disciplinary knowledge of the curriculum, and of their relationship, for as Young notes Vygotsky’s great contribution to curriculum has been to suggest ‘that the relationship between the two [everyday knowledge and scientific theory] needs to be located pedagogically and historically and understood in relation to a broader notion of human purposes (Young 2003:115).

Knowledge	.....Homogenous	Diverse
Curriculum	Institutionalised.....	Autonomous

**Table 6** Cultural openness

Process	Cultural factors	Degree of ease
<b>Conceptualise</b>	Knowledge Curriculum	Homogenous
<b>Create</b>		.....Institutionalised Diverse Autonomous
<b>Curate</b>		
<b>Circulate</b>		
<b>LoCate</b>	Knowledge Curriculum	Homogenous ..... Institutionalised Diverse Autonomous
<b>Copy</b>		
<b>Customise</b>		
<b>Combine</b>		
<b>Certify</b>		
<b>Critique</b>		

**Table 7** Cultural openness and degrees of ease in Open Education processes

## Pedagogic Openness

Pedagogic choices include identifying who the students are likely to be, where they might be located and what the resources are to which they might have access.

## Student demographics and types of engagement

In a classroom environment, this is almost self-evident, but in an environment where there is some uncertainty about whom the students are likely to be, where they might be located, what languages they speak and write and the resources are to which they might have access, some decisions need to be made as they influence the type of engagement. Czerniewicz<sup>31</sup> categorises what she calls “forms of

<sup>31</sup>[http://www.slideshare.net/laura\\_Cz/a-view-of-the-changing-digitally-mediated-teaching-and-learning-landscape-czerniewicz-heltasa-keynote-2013](http://www.slideshare.net/laura_Cz/a-view-of-the-changing-digitally-mediated-teaching-and-learning-landscape-czerniewicz-heltasa-keynote-2013)

provision” as ranging from face-to-face (F2F) only, internet supported, internet dependent, online intensive and fully online. Although OER and even Open Textbooks might be digital in origin, they can be used in a printed form in F2F interventions. For example, the Siyavula initiative caters for the printing of Open Textbooks as well as associated multimedia resources on the internet and interaction via mobile phones (Siyavula<sup>32</sup>; Dlodlo&Foko 2012). Because of their dependence on the internet, MOOCs by definition are fully online in the first instance, but may be used in interesting ways in so-called wrap-around MOOCs to expand the “space of possibilities for blended course designs ... [i.e.] those that combine online and face-to-face learning experiences” (Bruff, Fisher, McEwen & Smith 2013).

## **Pedagogic strategy**

While some educators specifically at the schooling level may not have much choice around the curriculum, they often do have choices around how they teach or facilitate students’ learning. Dabbagh (2005) and Dabbagh and Bannan-Ritland (2005) provide a very useful explanation of a number of “instructional or learning strategies” that can serve as a basis for understanding the range of more didactic to more collaborative to more exploratory pedagogic strategies either implicit within the OER, Open Textbook and/or MOOCs or explicitly enacted in synchronous or asynchronous sessions. Dabbagh and Bannan-Ritland (2005) refer to the more instructionist or didactic pedagogic strategies as “supportive learning strategies” such as modeling, explaining, providing feedback, scaffolding and coaching. They distinguish a middle range of “dialogic learning strategies” including promoting articulation and reflection, as well as supporting multiple perspectives, collaboration and social negotiation. Lastly they identify a category they refer to as “experiential learning” which includes inquiry-based learning, teacher-guided discovery, experimentation, problem-solving, exploration, hypothesis generation and role-playing.

With very granular OER, the pedagogy might be quite embedded within the actual resource, while the pedagogic strategy in an Open Textbook is usually more explicit in the type of material design. Likewise with MOOCs, the pedagogy is usually more overt as the various tuition sessions will, by default, be exhibiting a pedagogical strategy.

A particular challenge with Open Education is that the self-learner might need to take on this pedagogic role, especially in relation to OER, as the educator is missing from the equation. In other words, using OER the student takes on the role of selecting the material, ordering it in a particular sequencing and setting the pace of the engagement with the subject matter.

The appeal of the MOOC is that there is some kind of pedagogical support in the form of peers in a so-called cMOOC and a tutor/lecturer/instructor in an xMOOC. In an xMOOC environment the tutor/lecturer/instructor takes on the role of selecting the material, ordering it in a particular sequencing and setting the pace of the engagement with the subject matter.

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<sup>32</sup><http://www.siyavula.com/>

## **Learning strategy**

By implication from the aforementioned pedagogic strategies, the learners play a more passive or active role in their own learning. In response to supportive pedagogies they are mostly likely to be watching, listening, undertaking incrementally more difficult tasks and receiving feedback. In response to dialogic strategies they will probably be speaking, writing, thinking, comparing perspectives, collaborating, negotiating with others. In response to experiential pedagogies learner will be researching, problem-solving, experimenting, generating and contributing new ideas.

Given the lack of pedagogic guidance in OER, it may be that learners have to play a more active role in their learning. Unless the pedagogic strategy of a MOOC is deliberately drawing on some kind of dialogic or experiential pedagogies, students are likely to play a more passive role.

## **Assessment strategy**

In line with the three broad pedagogic strategies mentioned above, the categories of assessment can broadly be construed as teacher-assessment, peer-assessment and self-assessment. Teacher assessments are likely to include examinations, tests, assignments, while peer-assessment is likely to include draft assignments and self-assessment built-in quizzes or reflection tasks.

While OER might provide examples of examinations, tests and assignments, actual assessment is usually relegated to the student themselves. Some Open Textbook providers may offer premium services for assessment (e.g. Siyavula), but it is usually only in MOOCs where actual assessment takes place. Depending on the numbers of students, this is likely to include a range of self-assessment and/ or peer-assessment. Teacher-assessment is usually reserved for those students taking the “signature track” where the assessment is verified.<sup>33</sup>

## **Accreditation or certification mechanisms**

The emergence of MOOCs has brought the issues of certification of courses and formal acknowledgement of these to the fore. Even if students do not complete a MOOC because they have to register, there is a great deal of “learning analytic” data that can be drawn upon to help evaluate the adoption of MOOCs. OER repositories at the moment seldom ask for login details, (an exception includes Bookboon<sup>34</sup>) so the opportunity to evaluate use is lost from the start!

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<sup>33</sup><https://www.coursera.org/signature/>

<sup>34</sup><http://bookboon.com/>

## Evaluation strategies

Because students register for MOOCs, it is now possible to use the assessment data, i.e. completion data, achievement levels, time taken to complete to use as input for an evaluative step. Although this is still in its infancy, the learning analytics to monitor, reflect upon and evaluate the overall success of Open Education. Ideally this loop will provide what Grover et al. (n.d.) refer to as “evidenced-based improvement”.

Type of engagement	F2F	Internet supported	Internet dependent	Online Intensive	Fully online
Pedagogic strategy	Didactic.....Collaborative.....Experiential				
	<b>Supportive pedagogies</b> modeling, explaining, providing feedback, scaffolding, coaching	<b>Dialogic pedagogies</b> articulation, reflection, supporting multiple perspectives, collaboration, social negotiation		<b>Experiential pedagogies</b> inquiry-based learning, teacher guided discovery, experimentation, problem-solving, exploration, hypothesis generation, role-playing	
Learning response	Passive.....Active				
	<b>Responding</b> watching, listening, undertaking incrementally more difficult tasks and receiving feedback	<b>Engaging</b> speaking, writing, thinking, comparing perspectives, collaborating, negotiating		<b>Acting</b> researching, problem-solving, experimenting, generating and contributing new ideas	
Assessment strategy	Formal.....Informal				
	<b>Teacher-assessment</b> examinations, tests, assignments	<b>Peer-assessment</b> draft assignments,		<b>Self-assessment</b> quizzes	
Certification or accreditation mechanisms	Formal.....Informal				
	<b>Accreditation</b> Qualification	<b>Certification</b> Course certification		<b>Acknowledgement</b> Completion or attendance certificate, badge	
Evaluation strategy	Formal evidence.....Informal evidence				

**Table 7** Pedagogical openness

Process	Pedagogical factors	Degree of ease
Conceptualise	Type of engagement	F2F.....Online
	Pedagogic strategy	Didactic.....Collaborative.....Experiential
Create	Learning response	Passive.....Active
	Assessment strategy	Formal.....Informal
Curate		
Circulate		
LoCate		
Copy	Type of engagement	F2F.....Online
	Pedagogic strategy	Didactic.....Collaborative.....Experiential
Customise	Learning response	Passive.....Active
	Assessment strategy	Formal.....Informal
Combine		
Certify	Assessment strategy	Formal.....Informal
	Accreditation mechanisms	
Critique	Evaluation strategy	Formal evidence.....Informal evidence

**Table 8** Pedagogical openness and degrees of ease in Open Education processes

## Financial Openness

There is some debate around the cost of Open Education that ranges between positions that insist that to be truly open, materials (in particular), should be free of charge (Downes 2007) to those that feel a charge is defensible (Thrun<sup>35</sup>).

Activists such as Stephen Downes argue that “the concept of ‘open’ entails, at a minimum, no cost to the consumer or user of the resource” and argues that “even when the cost is low - or ‘affordable’ - the payment represents some sort of opportunity cost on the part of the user, an exchange rather than sharing” (2007:32). He queries whether “some sort of payment by the user whether that payment is subscription fees, contribution in kind, or even something simple, such as user registration, ought to be called ‘open’ [as the] requisite payment imposes [an] overhead on the distribution of the resource, mitigating the value of the resource” (Downes 2007:32).

Sebastian Thrun, founder of Udacity, has changed his mind about charging for services. In an interview he reports that he feels “confident asking people for money because their money is better spent on this than doing a free course and dropping out after a week” explaining that “Generally a free product has less of a commitment than a paid product.”<sup>35</sup>

Financial	Least affordable.....Most affordable					
	Charged	Small charge	Subscription fee	Contribution in kind	User registration	Free

**Table 9** Financial openness

<sup>35</sup><http://pando.com/2014/05/12/a-qa-with-godfather-of-moocs-sebastian-thrun-after-he-disavowed-his-godchild/>

## Conclusions

As a contribution to framing the discussion on OER, Open Textbooks and MOOCs at the OER Asia Symposium 2014, I have offered a way of understanding the Open Education trajectory from learning objects to OER to Open Textbooks and finally to MOOCs. I have endeavoured to extend the current ideas around the OER cycle to one that includes additional activities to be more broadly applicable to Open Education in general. The so-called 10C Open Education Cycle includes a *conceptualisation* step which refers to the understanding of the provenance of the knowledge that underlies the curriculum; a *creation* step which refers to the development of original materials and/or tuition by the author or institution; a *curation* step which refers to the preservation or storage of the materials and/or tuition; a *circulation* step that refers to the hosting of these on a publically accessible platform with appropriate open licensing and metadata; a slightly artificially coined “*loCate*” step that refers to the ease of finding and discovering Open Education materials and/or tuition; a *copy* step that allows for Open Education materials and/or tuition to be used in an unaltered manner; a *customise* step that refers to the localising or adapting of the materials and/or tuition; a *combine* step that refers to the decomposing, re-mixing and re-assembling of materials and/or tuition in accordance with the open licence that the original author or institution selected; a *certify* step to cater for activities around how to accredit Open Education and finally an evaluative *critique* step, (also slightly artificially named so that this forms a relatively easy 10C heuristic of a suggested Open Education cycle), to prompt monitoring, research and reflection on the entire Open Education cycle.

There are at least five groups of factors that influence all of the Open Education processes in some form, across a spectrum that dictate the degree of ease or difficulty in undertaking these processes. These include *technical factors* of interoperability and open formats; connectivity costs and bandwidth; the availability and discoverability of both original and derivative work. The *legal factors* that may influence the ease with which creation and re-creation may take place include the open licensing knowledge and specific advisors that can be drawn upon for legally complex materials and/or tuition in combined or re-mixed forms. *Cultural factors* such as conceptions of knowledge and suitable curricula in various contexts are probably the most vexing of the all the factors as there is still the built-in paradox that Wiley (2001) referred to. More homogenous knowledge might be easier to “re-use”, but this also limits diversity of perspectives a particular concern to those in the Global South. *Pedagogical factors* can also inhibit Open Education as attention needs to be paid to the type of engagement with students, the pedagogical strategies, the learning strategies, the assessment strategies, accreditation mechanisms and evaluation strategies for students that the original creator might never have imagined. Financial factors seem to play a constraining role in Open Education, as we have yet to find a sustainable business model that indeed democratize education.

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<sup>36</sup>[roer4d.org](http://roer4d.org)