The Role of Open Educational Resources in Personal Learning

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Introduction

In this chapter, two perspectives of Open Educational Resources are considered: one from the perspective of a person who owns or produces the resource; and the other from the perspective of the person who requires access to the resource. The former model, it is argued, does not take into account the various dimensions of openness, and is vulnerable to various ways of closing access to resources.

In an effort to address the barriers to open education, a new form of online learning, the Massive Open Online Course (MOOC), was developed by me and my colleagues. The original MOOC is designed according to the principles of self-organising networks of entities. (I was the originator of the MOOC, delivering the first one with that name with George Siemens in 2008. It was a connectivist MOOC, a form now being distinguised with the term cMOOC as opposed to xMOOCs that deliver courses using video lectures and more traditional approaches.)

A series of these MOOC-based courses has been offered since 2008. An observation of these courses shows widespread production and use of Open Educational Resources (OER) within these courses.

It is suggested that by understanding the use of OER as "words" in a language used by participants in a MOOC to communicate with each other, we can explain the role of OER in personal learning. A course offered as a MOOC instantiates the properties of a self-organising network and, as a result, is resistant to the forces that limit the effectiveness of traditional OER.

The Idea of Openness

The central argument of this paper can be summarised as follows: learning and cognition take place in a network, and networks need to be open in order to function; therefore, learning and cognition need to be open.

To the former point we address the major tenets of the pedagogical theory known as connectivism (Siemens 2004). According to Siemens:

> "Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories…. The starting point of connectivism is the individual. Personal knowledge is comprised of a network, which feeds into organizations and institutions, which in turn feed back into the network, and then continue to provide learning to individual. This cycle of knowledge development (personal to network to organization) allows learners to remain current in their field through the connections they have formed."

As Siemens writes, "A network can simply be defined as connections between entities. Computer networks, power grids, and social networks all function on the simple principle that people, groups, systems, nodes, entities can be connected to create an integrated whole." Connectivism, as it is typically presented, encompasses the description of learning as it occurs in two major types of network. First, it describes the conditions conducive to learning in a synaptic network, as is characteristic of the human brain (LeDoux 2002). Second, it describes the conditions conducive to learning in a social network, as is characteristic of a learning community (Watts 2003).

To the latter point we address the need of entities in the network to be able to communicate in order for the network to function. A network is not simply a system in which the entities are joined or related in some way. For a connection to exist, it must be possible for a change of state in one entity to result in, or have as a consequence, a change of state in another entity. In a simple case — for example, a Hopfield net — one entity in the network may exhibit an excitatory or inhibitory effect on the other (Hopfield and Tank 1986).

Openness, then, is in the first instance the capacity of one entity in a network to change or influence the state of another entity in the network. However, in the fields of content management and online learning, the concepts of "open" and "Open Educational Resources" have had a much wider connotation.

Much of what is written with respect to open content and open systems is derived from Richard M. Stallman's original definition of what he called "free software" as four elements (Stallman 1994):

- Freedom to run the software
- Freedom to study the software
- Freedom to distribute the software
- Freedom to modify the software

This is a definition that has carried over into the OER movement. David Wiley's original open content licence, for example, as based on "the premise that non-software content — specifically educational content — should be developed and shared in a spirit similar to that of free and open software" (Wiley 2003).

Definitions based on Stallman's four freedoms, however, may be open to challenge. When people talk about open source software, they talk about openness and freedom from the perspective of the person who already has the software, who already has it in his or her hands and wants to do things with it, like read it, share it or modify it. And anything that restricts what that person *does* with it is considered an infringement on the freedom. It gives the user the flexibility to do what he or she needs in order to get work done (Debian 1997).

The difference between these two models comes to a head with respect to commercial use. According to some, a licence that prohibits the sale of software is a limitation on its freedom. Debian (2007), for example, argues, "There is no restriction on distributing, or even selling, the software. This last point, which allows the software to be sold for money, seems to go against the whole idea of free software. It is actually one of its strengths. Since the licence allows free redistribution, once one person gets a copy they can distribute it themselves. They can even try to sell it."

But what of people who do not have the software, and need the software? The "four freedoms" of Stallman (1994) begin to change because, from the perspective of someone who does not have the software, freedom would be open access *to* the software with no restrictions. Anything that infringes on that open access is a restriction on that person's freedom.

In my contribution to an OER debate hosted by UNESCO, I described an alternative approach to open licensing (Downes 2011a). I described my own content licence, which was in turn derived from the licensing practices of George Reese, the creator of the Nightmare MUD Library. The licensing arrangements for MUDlibs were created, not with coders and programmers in mind, but with MUD players. As Reese (1998) writes:

> "Since all drivers except DGD were derived from LPMud 3.0, they all require a copyright at least as strict as that one, which basically states that you can use the server as you like, so long as you do not make a profit off of its use. Most current servers have much more strict and explicit copyrights. On top of that, many of the mudlibs which exist also have similar copyrights. To require money of your players is therefore a violation of international copyright laws. DGD requires licensing through a third party company."

As I noted in the UNESCO debate, Lars Pensjö, who wrote the original LPMud in 1989 (Bartle 2003, p. 11), wanted to ensure free access to MUDs for the players. As the original MudOS licence stated, "Permission is granted to extend and modify the source code provided subject to the restriction that the source code may not be used in any way whatsoever for monetary gain" (mwiley 1999). As the discussion makes clear, this is not a prohibition against the recovery of reasonable expenses. It is intended mostly as a prohibition against one person using another person's work for profit.

The importance of this has become clearer 20 years later when we look at what has become of the online multi-player role-playing environment. The licence conditions weren't respected. As Richard Tew (Donky) writes, "That's the thing with releasing mudlibs: people make a few trivial changes and then decide that it has changed so much that it is effectively something completely new" (Tew 2010).

After appropriating the idea and (often) the source code, the commercial sector came to dominate the world of multi-player role-playing games. Today, if you want to play, you pay.

It is not necessary to establish that one or the other of these interpretations is "correct" in order to establish that there are different meanings of the term "open" depending on one's perspective. So the question is: What is the correct perspective from which to be looking at the issue in the context of learning — online learning in particular?

The Challenge: Making Things Unfree

As noted above, it may be argued that the non-commercial condition attached to an open licence means that the content is not really free. But from another perspective, it can be argued that if someone is charging money for access, then the content is not free: not free in the sense that it does not have to be paid for, and not free in the sense of being able to use it as one wishes.

A common response from the defenders of commercial use has been that the content is always available for free somewhere. For example, D'Arcy Norman can be found arguing that commercial use "does nothing to push content into commercial exclusivity, and I would argue gives a relief valve against it — the original content is always available for use, re-use, etc. ... without having to give a penny to the opportunistic monetizer(s)" (Norman 2010). So, it does not matter if, say, Penguin sells a copy of *Beowulf* because *Beowulf* is in the public domain and readers can always get it for free somewhere else.

Against this response it may be observed that when there is commercial use of free resources, there is significant motivation to prohibit or prevent the free use of these resources. So even if theoretically it is the case that there could be free copies of *Beowulf*, the commercial publishers of *Beowulf* may devise mechanisms to prevent or discourage access to the free version. As a result, an entire infrastructure has been created, drawing on community support to foster the creation of open content, and then leveraging market mechanisms to commercialise this content.

For example, in my own study of models of sustainable OER, I found that most of the projects that produce OER are publishing projects (Downes 2007). The resources are coming out of either commercial publishing houses, universities that traditionally feed materials into commercial publishing houses, or foundations. The different models for the sustainability of OER were all based around that paradigm. For instance:

- *The endowment model* – This model is used by the Stanford Encyclopedia of Philosophy. A sum of money is invested and draws interest, and the earnings from interest are used to publish the resource (Loy 2009).

- *The membership model* – Fees for membership in a consortium are charged, and members participate in the creation of the resource.

- *The donation model* – Both Wikipedia and National Public Radio in the United States use the donation model. It is based on the idea that some organisation will do some publishing.

But even if you have these free resources hanging around, commercial publishers still manage to get you to pay for them. There's a variety of ways they do this (though when people pay for memberships, they usually expect privileges, and that typically means some sort of privileged access):

- *Lock-in* – If a user is locked into a certain technology (say, iTunes or the Kindle), then the material that would normally be available for free is, within that environment, only available at a price.

- *High bar* – Stringent but unnecessary conditions make free distribution unaffordable. For example, a service might require that learning object metadata, which has about 87 fields, *must* be filled in for it to be registered. The commercial publisher can afford to hire someone to sit there and fill metadata fields, but free content providers don't have that kind of resource.

- *Flooding* – Another way of making users access the commercial content rather than the free content is "flooding." This can be observed by doing a search at Google for information on popular topics of learning — language learning, for example. The listings are flooded with search-engine-optimised commercial resources to the point that any free resources have been pushed far down the list.

- *Conversion* – Providers give users a free resource, convert it to a commercial resource, and then get users to pay for it because they have become dependent on the free resource and can't bear to be without it.

There can be disagreement with the details of this characterisation, but it becomes evident from the proliferation of such practices that there is an entire economy around creating content that is free, commercial, widely published, available by subscription — a whole infrastructure surrounding the idea of putatively open educational content. It is open educational content only to a degree, with restrictions, if circumstances permit, using certain technologies.

And that is the story of OER. Understanding the numerous other dimensions of openness also helps us understand additional ways the resources can be unfree.

Dimensions of Openness

In our work in connectivist courses, George Siemens and I have depicted the progression of openness in three major stages:

1. Openness in educational resources

2. Open courses

3. Openness in assessment — an as yet unrealised openness (Downes 2011b)

This is similar to the five-stage logic model proposed by James C. Taylor (Taylor 2007) and later adopted by the Open Educational Resources University (OERu) (Day et al. 2011):

- Learners access courses based on OER

- Open academic support by "Academic Volunteers International"

- Open assessment by participating institutions

- Participating members grant credit for courses

- Students awarded credible degree or credential

In these two models, we see three distinct forms of openness: of access to learning resources, of instruction, and of assessment and credentialing. Sir John Daniel, the former president of the UK's Open University, describing "dimensions" of openness, refers to the openness as related to openness of access or admission to a university programme, open resources, and then openness in being able to determine one's own educational progression, one's own course of studies (Daniel 2011b).

Additional literature brings to bear discussion of additional forms of openness. In order to understand the importance of openness to networks in education, we may identify these systematically.

- *Open curriculum* – The list of topics to be studied, or competencies to be acquired, or methodology by which learning is to be achieved, may be a more or less open resource. Arguably, MIT's OpenCourseWare was as much an advance in open curriculum as it was open courseware, as it now became evident to all just what MIT students studied in order to obtain MIT degrees. The South African Curriculum Wiki, no longer extant, was an early example of this (Richardson 2005).

- *Open admission* – Open admission, as documented above, is a process whereby a person is not required to offer evidence of previous academic standing in order to qualify for access to a learning opportunity.

- *Open standards* – In education, there's a variety of standards intended to facilitate how we describe, how we discover, and how we re-use educational resources. The central of these is called learning object metadata, or LOM, created originally by the Aviation Industry Computer-Based Training Committee (AICC), then passed on by Instructional Management Systems (or IMS), then standardised under IEEE, and then really standardised under the ISO standards organisations.

  But there are other standards as well: Learning Design, Common Cartridge, and Learning Tools Interoperability. The United States military, under the auspices of Advanced Distributed Learning (ADL) came out with the Sharable Courseware Object Reference Model (SCORM), which is the standard in commercial online learning.

  In some cases these standards are typically called "open," while in others they are more proprietary. For example, IMS supports itself with a membership system. Members that pay fees have access to the standards ahead of their formal release. By contrast, IEEE posted the Learning Object Metadata standard openly while it was still being discussed and decided upon, but charges a fee for the finished product.

- *Open source software* – Open source software has had a significant impact on online learning. Widely known is Moodle, a PHP-based open source learning management system created originally by Martin Dougiamas with the support of thousands of volunteer programmers. Moodle is small, portable and useful for colleges and schools. By contrast, the open source Sakai was built by a consortium of universities as part of MIT's Open Knowledge Initiative and is a large suite of enterprise software.

Other open source education projects include: Elgg, which is an open source social network software for learning; Atutor; LAMS (Learning Activity Management System); and School Tools. And more types of software are available at Schoolforge or Eduforge.

Open source software is released under one or another type of open source licence. To overgeneralise, one sort of open source licence, such as the Berkeley Software Distribution, allows open source software to be integrated into commercial uses while the other, such as the GNU General Public License, does not. In practice, open source software licensing is a thicket of options and permutations.

- *Open Educational Resources* – More specific to most of the papers in this volume are the open educational resource projects themselves. Here we list just a few of them. One of the earlier ones, and certainly the most famous, most heavily promoted, is MIT's OpenCourseWare project (OCW). Something that's also received a lot of attention recently (because it was featured on the TED videos) is the Khan Academy, which is a whole series of YouTube videos on mathematics, physics and similar science and technology subjects. MERLOT is a project that was created by a consortium of North American educational institutions.

  These are just a few of dozens of projects that have been set up specifically to create educational materials for distribution for free (or some version of free) to people around the world.

  The licensing of these resources, in order to make them available for use and re-use, was based on the GNU Free Documentation License (GFDL), which covered documentation associated with open source software. The GFDL did not allow for some types of restrictions, most notably, the "non-commercial" restriction.

  More recently we've had Creative Commons. Creative Commons is now arguably the dominant mechanism for licensing OER and, indeed, for licensing open content of any sort. Devised by lawyer Lawrence Lessig, Creative Commons provides the licensor — the person who owns the material — with a series of choices allowing the author "some rights reserved." These include the non-commercial clause, an attribution requirement, share-alike, and a no-derivatives clause.

  One of the most popular forms of Creative Commons licence is the one that I use, "Creative Commons by Non-Commercial Share-Alike," which means that I want to be attributed, I do not want the content to be used commercially, and I want it to be shared under the same licence that it was obtained under. For more information on licences, see Chapter 6.

- *Open teaching or tutoring* – Open teaching is the provision of live access to teaching activities or resources. As access to a TED video, for example, might be access to the resource, being able to watch a TED talk live — whether in person or online — is access to open teaching (though, of course, TED learning opportunities are manifestly *not* open). Open tutoring extends this idea to include openness of *interactivity* with the instructor or tutor.

MOOC Design Principles

It is evident from the discussion thus far that although much of the attention focused around open learning has been on the publication of OER, there are different perspectives and a range of types of openness to consider.

The original concept of the MOOC (Massive Open Online Course) was designed with these wider considerations in mind. It therefore focused not on the narrow question of licensing and distributing course materials, but on the wider question of promoting and preserving openness across all dimensions.

In order to best accomplish this, the MOOC is designed as a *network* rather than as a linear progression of subject materials or curriculum. In this way, all aspects of the course are distributed across all participants rather than centralised into a single location.

A network is composed of a set of *entities* (also sometimes called "nodes" or "vertices"). Entities form *connections* (also called "edges") with each other. The Internet, for example, is a network, and network course design parallels that of the Internet (Spinelli and Figueiredo 2010). The vertice and edge terminology is from graph theory, from which the course design is also derived (Diestel 2010, p. 2). Networks of connected entities can arguably perform cognitive functions and, correspondingly, "connectionist" computer systems are intended to emulate the functioning of a "neural network" such as the human brain (Stufflebeam 2011).

These principles have been described in previous work (Downes 2005) and may be summarised as follows:
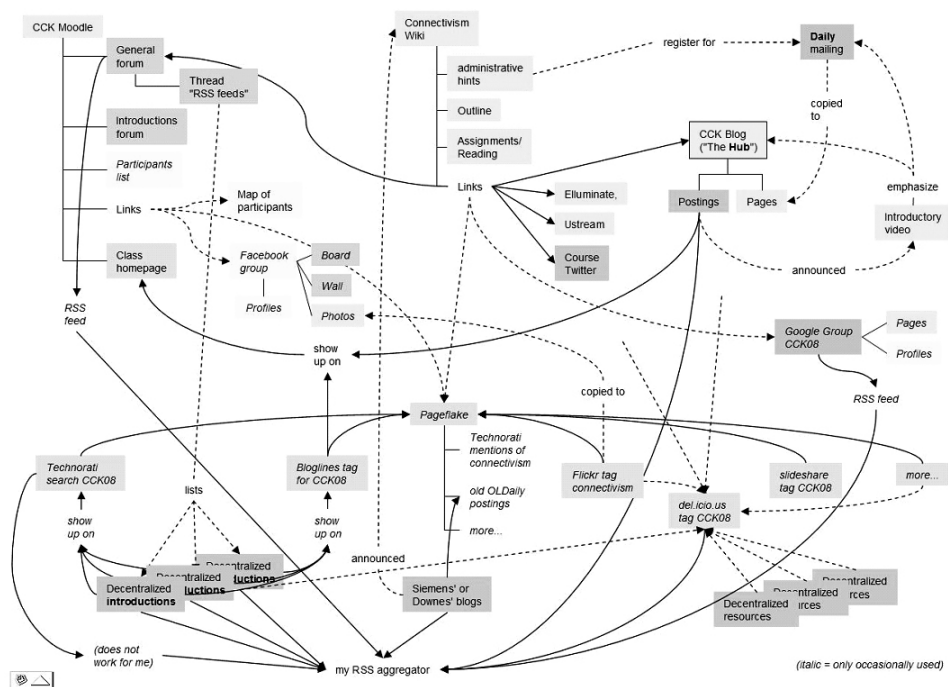
- *decentralisation* – connections are organised into the form of a mesh, rather than the hub and spokes more characteristic of a hierarchy

- *distribution* – the representation of concepts or ideas is not contained within a single node, but is distributed across a number of nodes

- *disintermediation* – direct communication from node to node is possible and encouraged

- *disaggregation* – nodes should be defined as the smallest reasonable component, rather than being bundled or packaged

- *dis-integration* – nodes in a network are not "components" of one another, and are not depicted as being organised as components of a "system"

- *democratisation* – nodes are autonomous, and a diversity of node type and state is expected and encouraged, membership and communications in the network are open, and meaning is generated interactively

- *dynamism* – the network is a fluid, changing entity with demonstrated *plasticity,* the ability to create new nodes and connections

- *desegregation* – though the network may exhibit clustering, there is nonetheless a continuity across the network, as opposed to a strictly modular design

Employing these principles, an organisation was developed that created several types of entities: persons (i.e., people registered for the course); authors (i.e., creators of learning resources); posts (entities created by course authors); links (entities created by persons and authors); files (audio, video or slide multimedia); and events.

The course proceeds by means of seeding the network gradually through time with posts, encouraging people to connect with these resources and with each other through the creation of posts and links, connecting participants in real time via hosted events, such as online lectures by guest speakers, and creating and capturing multimedia files.

That the MOOC, as described, constitutes a network becomes evident through analysis of the structure of the MOOC. Illustrated in Figure 15.1, for example, is the structure of the initial seeding provided by course facilitators.

Figure 15.1: Network structure of a MOOC: X28's New Blog, 6 September 2008 (Melcher 2008).

CCK Moodle — General forum — Thread "RSS feeds" — Introductions forum — Participants list — Links — Class homepage — RSS feed

Connectivism Wiki — administrative hints — Outline — Assignments/Reading — Links — Elluminate, — Ustream — Course Twitter

register for — Daily mailing — copied to — CCK Blog ("The Hub") — Postings — Pages — emphasize — Introductory video — announced

Map of participants — Facebook group — Board — Wall — Profiles — Photos — show up on

Google Group CCK08 — Pages — Profiles — RSS feed

Pageflake — Technorati mentions of connectivism — old OLDaily postings — more...

Technorati search CCK08 — lists — Bloglines tag for CCK08 — Flickr tag connectivism — slideshare tag CCK08 — more... — del.icio.us tag CCK08

show up on — show up on — copied to — announced — Decentralized introductions — Decentralized — Siemens' or Downes' blogs — Decentralized resources — Decentralized resources — Decentralized resources

(does not work for me) — my RSS aggregator — (italic = only occasionally used)

The deployment of a MOOC as a learning environment has been documented in numerous places elsewhere (Kop et al. 2011). What is important in this enquiry is the role being played by OER in the course structure to produce the dimensions of openness described above.

Evidence of OER Production and Use

There is significant evidence that one of the primary activities of participation in a MOOC is the use, re-use, and production of OER, so much so that the pedagogy of the MOOC is also referred to as the "pedagogy of abundance" (Kop et al. 2011).

As demonstrated in Kop and Fournier's 2010 analysis of a recent MOOC, "Personal Learning Environments, Knowledge and Networks (PLENK)," participants submitted numerous blog posts and their discussions around these posts took the form of a network, as shown in Figures 15.2 and 15.3.
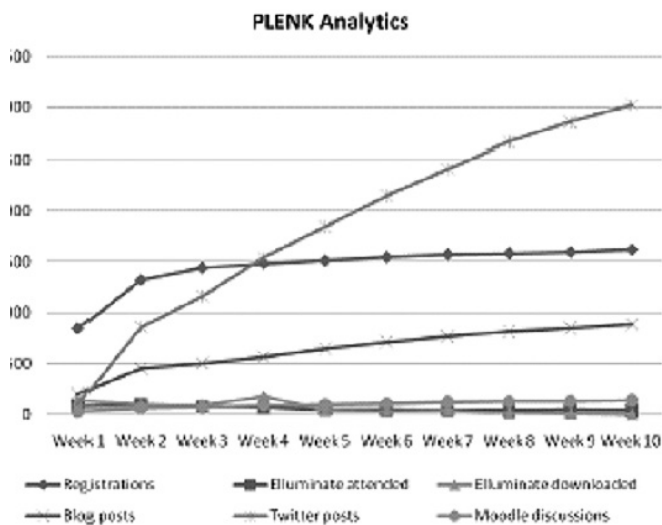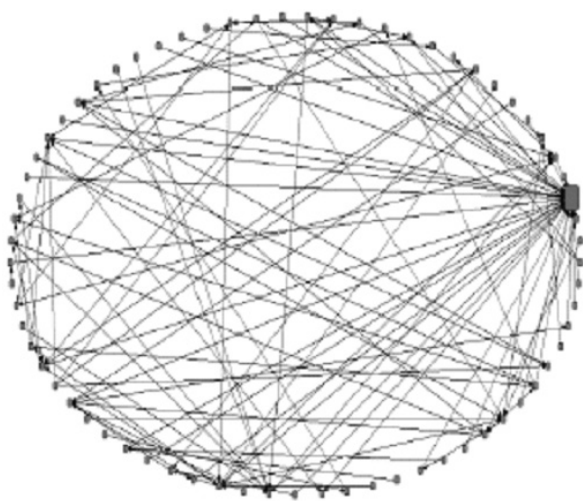
Figure 15.2: PLENK participation rates.

Figure 15.3: Connections between participants in a discussion (Kop and Fournier 2010).

In the more recent #Change11 MOOC (http://change.mooc.ca), we see even greater levels of creating and communicative activity. Figure 15.4 shows the cumulative number of feeds, the number of blog posts, and the number of Twitter posts made by course participants, as well as the level of participation by sign-ups and newsletter subscriptions.

Figure 15.4: #Change11 participation rates.
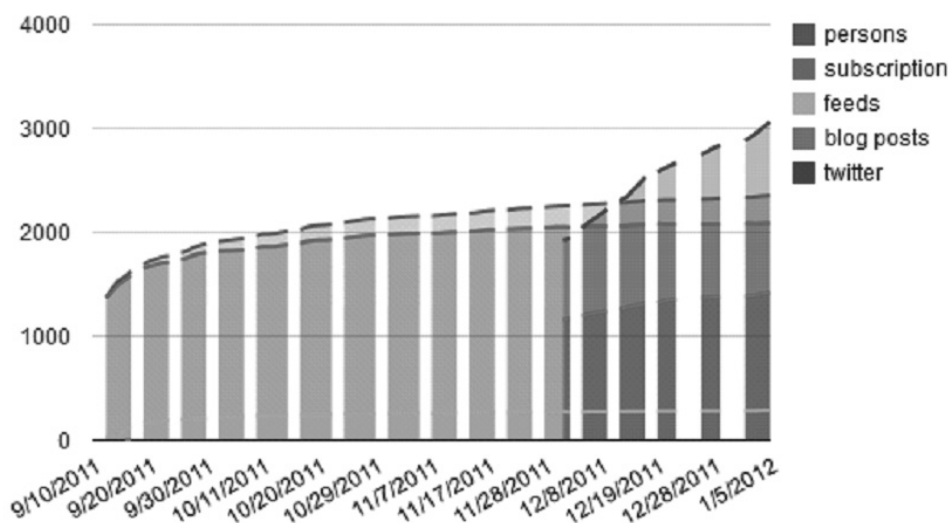
Note that day-by-day counting of blog and Twitter posts started in early December and by then had already numbered in the thousands, including 1,422 blog posts. As the course progressed through to January, the numbers of each steadily increased, showing a continued engagement and production of course artifacts.

Preliminary analysis of the #Change11 suggests that, as in the case of previous MOOCs, a substantial number of external learning resources are being referenced and linked. Half way through the #Change11 course, for example, the participants in the 286 feeds had linked to 5,150 media artifacts, as shown in the course environment printout shown in Figure 15.5.

Figure 15.5: #Change11 media artifacts.

Participants are reading each other's blog posts, both directly and through the email newsletter distribution. Through the newsletter, we can count the number of times readers followed through to the blog post itself, and as of the half-way point, we note more than 30 posts having more than 100 click-throughs each (see http://change.mooc.ca/popular.htm).

There are two salient features of this activity.

- First, *none* of it is assigned reading nor does any of it appear in the course syllabus. Contents in the MOOC software are, as noted above, separated

between what administrators provide to seed the course and what participants contribute themselves.

- Second, *all* of it is hosted and obtained from sources external to the MOOC environment, which — because it is openly accessible — makes it all OER.

Adding up these numbers (noting that they do not include comments on blog posts or material referenced in those comments, or materials read or referenced in venues outside the course environment), and not including Twitter posts, gives us 6,472 OER implicated in the course thus far. Granted, a significant number of these (and especially of the media resources) will be trivial. The picture is nonetheless one of significant dynamic creation and exchange of OER.

The PLENK course and #Change11 course are not anomalies. Other MOOC courses also result in the creation and exchange of artifacts in this way. It will be the subject of further research to identify factors impacting the nature and rate of artifact creation and exchange. But it is clear it can be significant.

Jim Groom's "Distributed Storytelling 106" course uses the tag #ds106, and a Google search on #ds106 (as of this writing) yields more than 200,000 results. The "assignments" page, where students' work is aggregated from external sites where it has been posted, contains almost 7,000 items (699 pages of ten items each as of this writing; http://ds106.us/page/699/).

It is clear from these examples that when a course is designed according to network principles, and hence as a MOOC, the role of OER changes dramatically. Far from being published materials created by academics and authors and merely consumed by course participants, they begin to become the way in which these course participants *communicate with each other* and, as a consequence, their use and exchange numbers are not in the single digits but rather in the hundreds or thousands.

The (Open) Language of Learning

And this very point, this very distinction, is the distinction between what we might say are old and new depictions of OER, or educational resources generally.

The picture presented above of OER as things that are published, things that are presented by publishers in a very formal manner, probably charged-for and commercial — is the old static coherent linear picture of the world. It's not the model that we want to use for OER because it's not applicable in a network learning environment.

That brings us back to what we want to think about in OER. OER are a network of words that we use in whatever vocabulary we are using to conduct whatever activity it is that we're doing or that we're undertaking. They are the signals that we send to each other in our network.

If that is so, then what openness means in the context of OER is whatever is meant by openness in a network, where we think of openness in a network as the sending of these signals back and forth and so the sending of these resources back and forth.

We need to think about OER not as content but as language. We need to stop treating OER or online resources generally as though they were content like books, magazines, articles, etc., because the people who actually use them — the students

and very often the creators — have moved far beyond that. Each one of these things is a word, if you will, in this very large post-linguistic vocabulary. They are now language. They are not *composed* of language, they *are* language.

And that's why they need to be open.

Suppose that everyday words that people wanted to use (like "cat") were owned by, say, Coca-Cola. True, we have allowed a certain limited ownership of words in our society, but by and large we can't own words. We can't own the use of words to create expression. Now imagine if we had to pay royalties to use certain letters. So you could only use the letter "o" if you paid money to Ford. You could only use the letter "i" if you paid money to Apple. The effectiveness of language would be significantly impaired.

The thesis here is that the effectiveness of language would be impaired in exactly the same way the effectiveness of communication would be impaired, in exactly the same way the effectiveness of a network is impaired if you break down or block the links between entities.

The use of open resources in a MOOC is clearly that of a language, where the resources are the "words" sent back and forth between participants in a dense network of communication. It becomes clear that measures that would impair the flow of these "words" would damage this communication and render the MOOC itself mute.

We can indeed map the openness of a MOOC — which is open by design — to the various dimensions of openness mapped above.

In a MOOC, the curriculum is the construction of the MOOC itself: the lists of links to individual feeds, posts, links and other resources shared in the course. Opening these lists makes the structure of the MOOC transparent, and also allows people to participate in the MOOC without ever actually registering in it (this is a dimension of MOOC participation that has yet to be explored) and creates what amounts to open admission.

The MOOC is built using open standards to facilitate communication and content sharing. Because there is a great diversity of platforms and languages in a MOOC, common aggregation formats are used. The deployment of open source software (gRSShopper for PLENK and #Change11; WordPress for DS106) allows new standards or extensions to be implemented as needed. Participants can create their own MOOC applications or interfaces as well.

The most obvious dimension of openness in a MOOC is the sharing of OER, but it is important to recognise that the facilitators, by participating in this network of interactions, open their instruction as well. They do this by interacting bilaterally or with a group of participants in the MOOC, and by creating recordings or broadcasts of these interactions to share with other participants.

Finally, by virtue of its structure and its sharing of resources in a network environment, a MOOC is resistant to the sort of enclosure that afflicts traditional OER publishing.

Because there is no single environment, and because the MOOC consists essentially of a network of connections between autonomous entities, there is no mechanism for creating lock-in. Any technology employed by a person engaged in a MOOC could be easily exchanged for another technology supporting the same standards: any content provided by a participant could be exchanged for another.

The network structure of a MOOC also resists the privileging of certain content with high-bar qualifications needed to enter the network. Any participant in the network may contribute content and, as communications may be direct from person to person, there is no intermediating structure to impose a high bar.

Similarly, the flooding of search results and other centralised points of access is no longer an effective strategy for commercial media. Communications are exchanges of content *between the participants*, and not passive accessing of media from a centralised repository or store. Hence, there is no list to be flooded and no mechanism with which to impose undesired content into the perspective or point of view of the participant.

Finally, the means for conversion are minimal. A MOOC isn't a single entity on which one can become dependent; it isn't located in a single place; and doesn't require a key piece of technology. Consequently, there is no way to force a person to pay for access to a MOOC or any component of a MOOC.

Understanding OER as though they were words in a language used to facilitate communications between participants in a network should revise our understanding of what it means to be open, and what it means to support OER. It is clear, from this perspective at least, that openness is not a question of production, but rather a question of access.

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