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Introduction to Openness

"Openness is a controversial topic. Even people who agree on its desirability can disagree over what openness really means and how best to achieve it" (Mackie, 2008)

How can such a seemingly simple word like “open” be so difficult to define and understand? If open were a binary concept, either on or off, it could be defined in simple, dichotomous terms. However, the construct of openness is on a continuum, and therefore becomes a more complex idea with varying degrees of meaning (Hilton et al, 2010). For example, a door is not just open or closed, but has a range of openness. This same concept of openness can also be applied to openness in education. It is generally perceived that open in education means that education is available at no cost. However, in education this continuum of openness also holds true, and applies not only cost to, but also to all facets of what has evolved into the open education movement.

Even in differing contexts, those involved in open education agree on the importance of understanding openness. The notion of openness in education stems from “core Enlightenment concepts of freedom, equality, democracy and creativity” (Peters, 2008). At its core, openness is sharing, it is overcoming “mine” through generosity and giving (Wiley, 2009). Sharing and openness are altruistic arguments that are in line with academic traditions. And finally, Wiley (2009) surmises that education is a relationship of sharing, and that openness and sharing are really the only means in which education can exist.

Thorngate’s idea of commensurate complexity postulates that it’s impossible for behavior “to be simultaneously general, accurate, and simple” (Weick, 1979). Since we have already



determined that openness in education is probably not simple, this paper will, in general and hopefully accurate terms, outline some of the concepts in the emergence of open education, not by defining, but by marking a point in time in its evolution. Openness in education will not be described in finite terms, but rather, will be explored through the processes and frameworks that have contributed to the formation of the open education movement's identity and consciousness.

A Brief History of Openness in Education

We are on the cusp of a global revolution in teaching and learning. Educators worldwide are developing a vast pool of educational resources on the Internet, open and free for all to use. These educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge. They are also planting the seeds of a new pedagogy where educators and learners create, shape and evolve knowledge together, deepening their skills and understanding as they go..... This emerging open education movement combines the established tradition of sharing good ideas with fellow educators and the collaborative, interactive culture of the Internet. (Cape Town, 2007)

While open educational resources (OER) and open courseware (OCW) have been in the forefront of the open movement over the past decade, open education has been evolving over the past century. One might say that the kindling of open education itself during most of the twentieth century had been waiting for a spark to ignite the fire of the open education movement. Obviously, that spark has been the internet and World Wide Web, which has given us an unprecedented capability to share (Wiley, 2010). While previously giving away a physical book meant losing the ability to access that knowledge, now “both knowledge and expressions can be given without being given away” (Wiley, 2010).

In the beginning of the twentieth century, open education consisted of mostly political and psychological experiments to provide alternatives to mainstream education. Freedom of movement was investigated in the architecture of open classrooms, and from the late nineteenth century, freedom of location was being explored in the development of distance education.

During the rest of the twentieth century, distance education was developing along with other open learning explorations, such as: the Open Classroom, Open Schooling, the Open University, and Open Courseware (Peters, 2008).

The Open University had its vision's roots framed in 1926, when historian J. C. Stobart advocated a 'wireless university.' It wasn't until the early 1960s that this vision resurfaced in the UK, in discussions about creating the 'College of the Air' as a response to the exclusion from higher education of people from lower income groups. Through the 1960s planning continued, and in 1971 the Open University of the UK opened to students with the mission "to be open to people, places, methods and ideas" (<http://www.open.ac.uk/>). At about the same time in Canada, Athabasca University became North America's first Open University, "dedicated to the removal of barriers that restrict access to and success in university-level study and to increasing equality of educational opportunity for adult learners worldwide" (<http://www2.athabascau.ca/>).

Learning Objects and OER

At the heart of the movement towards Open Educational Resources is the simple and powerful idea that the world's knowledge is a public good and that technology in general and the Worldwide Web in particular provide an opportunity for everyone to share, use, and reuse it. (Smith and Casserly, 2006)

The open education movement is a connected system and a collection of interacting parts functioning as a whole. Open education is a system that is being defined as being "greater than the sum of its parts" (Mitra, 2012). Rather than attempting to summarize or explain all of the parts of the open education movement, the following section focuses on the evolution of two interrelated open education components, open educational resources (OER) and open licensing. These two components are indicative of other advancements in open education and are foundationally important to the open education movement.

The development of the computer in the 1960s brought about the beginnings of connecting users through technology with the ability for users to reuse others content. Ted Nelson, who also coined the term “hypertext,” developed a program called Xanadu, which allowed a network of users the ability to reuse computer created content and adapt that content with new meaning. Projects like these developed the conceptual foundation of modern content reuse and what we now know as learning objects (Wiley 2006). With the emergence of the World Wide Web in the early 1990s, Wayne Hodgins termed “learning objects,” that he used in software design as LEGO like closed objects in object-oriented programming (OOP) (Wiley, 2006).

Other approaches on the use of learning objects were Merrill’s (1998) “knowledge object”, Gibbons, Nelson and Richards’ (2002) “instructional objects,” (Wiley, 2006) and McGreal’s (2004) definition that a learning objects is “any reusable digital resource that is encapsulated in a lesson or assemblage of lessons grouped in units, modules, courses, and even programmes.” Wiley (2000) also began to contribute to the ideas and concepts of learning objects through his doctoral dissertation. Wiley’s definition of learning objects evolved from "any digital resource that can be reused to facilitate learning" Wiley (2000), to "any digital resource that can be reused to **mediate** learning" (Wiley & Edwards, 2003), to "any digital resource that can **be freely adapted** be reused to **mediate** learning" (Wiley, 2007).

During this period, the William and Flora Hewlett Foundation and UNESCO organized the first Global OER Forum in 2002, where the term Open Educational Resources (OER) was adopted. Open Educational Resources were 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.

Their principal use is by teachers and educational institutions support course development, but they can also be used directly by students. Open Educational Resources include learning objects such as lecture material, references and readings, simulations, experiments and demonstrations, as well as syllabi, curricula and teachers’ guides” (UNESCO, 2002).

While learning objects were not OER, and OER not learning objects, the two ideas would eventually coalesce for a more refined and understandable open approach to open education resources, combining the OER name and learning object concept. Both of these open educational ideas have evolved together, and Wiley (2006) portrays this evolution in writing, “Open Educational Resources: The Future of Learning Objects.” Wiley (2006) again addresses OER in a blog post, “RIP-ping on Learning Objects,” where he gets to the core of the arguments of defining learning objects and OER by saying, “So whether learning objects are dead or not, I couldn’t say. And to some extent, who cares? As long as people are willing to (1) openly share (2) educational materials that will (3) render properly in most web browsers, and they also (4) provide access to the unobfuscated source for the materials.”

As the concept of learning objects was developing, another movement, free software, not yet related to open education or OER, was beginning in the 1980s. Richard Stallman, the founder of the GNU project, began the free software movement in response to proprietary software developers, like Microsoft, “closing” software development by eliminating the openness and sharing of source code that was common practice among the open software “hackers” of the 1960s and 1970s. Stallman and the free software movement’s mission was to develop alternative softwares that were free and openly available. Because “free” did not have positive connotations in the business community, the free software movement eventually morphed into the open-source software movement in the mid-1990s (Wiley, 2009).

In education, connectivity, the overlap of unrelated elements and similarities of “open” values were beginning to find their way into open education literature. “At colleges and universities, visions of learning communities fostering the open development and exchange of ideas and useful services have guided the growth of institutional culture for years. Peer review is a hallmark of this system. The revolutionary open-source software movement shares this collaborative ideal.....Since higher education and the open source software movement share these values, is it possible that higher education might use an open-source metaphor or model....” (Moore, A., 2002). A. Moore (2002) also made the distinction between open-source knowledgware development (tools) and open-source courseware development (content). In 2002, with the release of MIT OpenCourseWare (MIT OCW) and UNESCO OER’s adoption, the open-source software movement and values began to infiltrate education and Richard Stallman’s ideas of “freedom” and openness began to contribute to the evolution of a new culture of openness in the open education movement.

Stallman was committed to free software, which meant not free as in cost, but free as in speech. Freedom to Stallman meant that people were willing to sacrifice intellectual property to create an open community based on sharing and openness. Stallman and GNU’s software contributions were significant, such as the influences in the development of the open-source Linux system, and the development of the GNU open licensing framework would become an important influence to modifying the approach to the open uses of copyright (Moore, JTS, 2002). The GNU General Public license remains in use today, and GNU’s free licensing concepts had a significant influence in developing the Creative Commons license that is the prevalent open license in use today.

Open Licensing

Open Licensing Slogans: “Buy One, Get One” (Wiley, 2009), “You Should Get What You Pay For” (Green, 2011), “Open Access to Publicly Funded Resources” (Green, 2011).

Creative Commons is another interrelated connection between the open education movement and open-source software and copyright uses surrounding open licensing. The open license that Creative Commons developed is not a replacement for the traditional all rights reserved copyright, but rather is used in conjunction with all rights reserved copyright as a some rights reserved “hack” of copyright laws (Wiley, 2009). In other words, the all rights reserved copyright remains in place but the Creative Commons license lets the user know what specific use permissions are being allowed by the author/owner. The open licensing concept provides a three layer design to copyright: 1) machine readable – found through search engines and other electronic means, 2) human readable – easy to distinguish licenses, and 3) the lawyer code of copyright law. “If the intent is to share and be open, you must make it legal. If you don’t use a creative commons, or similar open license, the default is all rights reserved, and therefore ‘closed’” (Green, 2011).

Even as simple as Creative Commons has made it to understand the licensing process for open material and OER, Wiley (2009) has simplified it further by identifying “The Four R’s of Openness,” a “framework which supports finer grained thinking about the legal rights that come with OER, and therefore those OER’s degree of openness” (Hilton et al, 2010). “The Four R’s include:

Reuse—The most basic level of openness. People are allowed to use all or part of the work for their own purposes (e.g. download an educational video to watch at a later time).

Redistribute—People can share the work with others (e.g. email a digital article to a colleague).

Revise—People can adapt, modify, translate, or change the form the work (e.g. take a book written in English and turn it into a Spanish audio book).

Remix—People can take two or more existing resources and combine them to create a new resource (e.g. take audio lectures from one course and combine them with slides from another course to create a new derivative work)” (Hilton et al, 2010).

“If creators of OER want their resources to be as open as possible they allow and facilitate all four R’s of Openness. A key tool that creators of OER have to legally permit these four R’s is open licensing.” (Hilton, 2009) Creative Commons provides several open licenses to help creators of content license their work in ways consistent with their desires for openness. There are four important provisions of the Creative Commons licenses. They are: Attribution, Non-Commercial, No-Derivatives and Share-Alike. The Creative Commons website defines these terms, and combinations of terms, in the following way:



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While the matrix of how these licenses can be used together might need further explanation, the Creative Commons site provides additional tutorials, licensing wizards and support to answer most questions (<http://creativecommons.org/>).

Self Organization

“‘Open education’ consisted of several strands and movements that often coalesced and overlapped to create a complex skein that despite the complexity was able to rapidly avail itself of new communication and information technologies in the last decade of the twentieth century and to identify itself more broadly with the new convergences among open source, open access, and open courseware movements.” (Peters, 2008)

With the onset of the internet, the emergent open education movement could be seen as an evolving self-organizing system, taking advantage of the interrelated occurrences over nearly

a century to achieve a collective identity in a new social and global paradigm in education. The impetus of technology and associated connectivity has now allowed the open education movement to move past an emergent entity to begin to develop its own cognitive abilities. While the movement will continue to struggle with emergent ideas, a stable base is being formed to position open education in a place globally to make lasting and impactful changes in education.

Attempting to find a definition for open education is difficult at best, and understanding why merits further investigation. Since most open influences in education have been outside of the mainstream during most of the twentieth century, there has been a lack of understanding and overall confusion on what the term “open” means in education. In general, there has been no outside force or system that has been organizing the open education movement, and the growth and evolution of openness has transpired, for the most part, in individual and isolated occurrences. Up until the last few decades, with the onset of the internet, openness in education has taken place primarily through unconnected events.

Connectivity and the internet has been the petri dish for open education that has allowed for the self-organization of a system to begin. About the time that the internet was coming into mainstream use in the late 1990s, Sugata Mitra, a scientist from India, began to study self-organizing systems in education with his “hole-in-the-wall” project in rural areas of India. His kiosks around India, equipped with a computer screen and a touchpad mouse, were left unattended within town centers. Mitra and his colleagues studied the organization of children and their use of the computer kiosks. The group learning that occurred in the children’s self-organized peer-to-peer teaching surprised all involved and caught the attention of educators around the world (Mitra, 2012).

Can these same principles of self-organization be seen in the development of the open education movement? Mitra (2012) writes that, “The only condition for self-organization and emergence seems to be that every part of the system must be connected in some way to every other part. For example, neurons in the brain are simple switches, but connect them all together and the whole mass begins to think. Could education be a process of self-organization, with learning being the emergent outcome?” Over the last two decades, as connectivity continued to improve, disparate and seemingly unrelated open development became connected. Open-source software became connected to open licensing which became connected to learning objects which became connected to open educational resources (OER) which became connected to open courseware (OCW), and so on.

Like flocks of birds flying in formation or rhythmic applause, open education began to take on properties of organization and emergence. Elements not previously observed as functional characteristic of open education began to become visible. While self-organization is being extensively studied in the natural sciences, “self-organization in human networks has been less studied, but collaborative environments, relay chats and digital communities on the Internet seem to indicate that simple rules of connectivity can lead to larger patterns of human behavior” (Mitra, 2012).

Mitra (2012) surmised the following: 1) connected systems can self-organize, 2) self-organizing systems show emergent behavior, 3) emergence can produce cognition, and 4) cognition and an ability to sense a past and a future can produce consciousness. Open education has shown emergent behavior, especially within the last decade, with the onset of organizations like UNESCO, the OCW Consortium, and Creative Commons, and their involvements in the development of OER, OCW, and open licensing. Is the open education movement becoming

cognitive and conscious, affected by past and present connectivity to other systems, and more importantly, can it anticipate future connections? These are questions to be pondered and discussed as the open education movement continues to evolve as part of a global culture in providing education that is open and free for all.

Open Frameworks

“Open education is a living and evolving idea.... It is axiomatic for an "open" movement such as this to be as inclusive of a diversity of teaching and learning approaches as possible. It is also essential for a movement of this nature to continue to evolve and redefine itself over time (Cape Town, 2007).

Rather than look at past or current static definitions of open education and analyze the nuances of their meanings, it would be more productive to focus on how developing fluid, flexible frameworks can be used as tools in the development of existing and new open education components. Wiley's (2009) “4 R's” is an example of a framework that was created to be utilized when designing OER. Development of additional frameworks like the “4 R's” that would be consistent with the values of the open education movement can enhance the consistency and unification of the open education philosophy and voice and create cohesion with new and emerging open concepts. These frameworks can aid emerging open learning elements, like massively open online courses (MOOC) or the open and informal learning concepts of the OERu, by allowing new open learning environments to build on previous frameworks, and then refine and develop these frameworks for future innovation. Many of these frameworks exist, and have already been through a refining process. However, the concept of these frameworks is still new and will require much research, practical application and refinement. Some of these existing frameworks are as follow:

Kahle's (2008) framework addresses the design of open technology, however, other open components can utilize such a structure when implementing open practices:

1. Design for access
2. Design for agency
3. Design for ownership
4. Design for participation
5. Design for experience

Green (2011) identified a framework for addressing policy makers in what he calls the "obviousness of openness" to help them understand the impact of policy decisions. His framework suggests that open policy should address:

1. Efficient use of public funds
2. Saving students money
3. Increasing access to education, and that
4. Publicly funded resources should be openly licensed (cc-by).

The ALMS Analysis (Wiley, 2009) is a framework for thinking about the ways in which specific media types and other technology choices contribute to an OER's degree of openness. The framework is utilized for thinking about the technical aspects of design and localization. ALMS is an acronym that stands for:

Access to editing tools? – What software is required to edit the file, and is the software reasonably accessible?

Level of expertise required to revise or remix? – A Microsoft Word file or Blogger post can be easily edited, but not software required to create 3D animations.

Meaningfully editable? - A scanned PDF document or hand written notes can't be easily and meaningfully edited easily.

Source-file access? - An HTML file is essentially the source file, or self-sourced, but a Flash file source file is rarely posted because it is composed of several file types, these types of files are not self-sourced (Wiley, 2009).

These framework examples don't define open education, but rather delineate processes by which they can better facilitate sharing and openness in education, and provide a guide for the growth and impact of the open movement in education.

Conclusion

As can be seen by the examples of the evolution of OER and open licensing, open education has grown in a self-organized manner aided through the connectivity of the internet and the World Wide Web. The emergence of open education as a global movement has been the result of the ability of the individual elements in the open movement to organize and combine into an entity where the whole is "greater than the sum of its parts." The movement is also gaining an identity and conscience by becoming a collection of smaller connected groups, perceiving themselves in the same category, and sharing emotional involvement toward their objective (Tajfel, 1982). This collective identity has created a fluid and relational community emerging out of interactions of different groups with similar values and goals (Poletta and Jasper, 2001).

This paper has only touched on just a few of the many organizations and initiatives that make up the open education movement. It's easy to lose the meaning of education in the latest "open" that comes along, or by trying to understand all of the many strands that make up open education. Education is a relationship of sharing, and it will be only by embracing the countercultural ideas of giving and sharing openly that the open education movement will reach its goal of making education free and accessible for all.

References

- Green, C.(2011, October 25). The Obviousness of Openness. *Open Education Conference 2011*. Park City, Utah. Retrieved February 28, 2012, from <http://youtu.be/CU6h-oI6hro>
- Hilton, J., Wiley, D., Stein, J., & Johnson, A. (2010). The Four R's of Openness and ALMS Analysis: Frameworks for Open Educational Resources. *Open Learning: The Journal of Open and Distance Learning*, 25(1), 37-44
- Kahle, D. (2008). Designing Open Educational Technology. In Eds Ilyoshi, T. and Vijay Kumar, M.S., *Opening up education: the collective advancement of education through open technology, open content, and open knowledge* (pp. 27-46). Cambridge, Mass: MIT Press. Retrieved February 24, 2012, from <http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11309>.
- Lane, A. (2010). Designing for innovation around OER. *Journal of Interactive Media in Education*, 2010(2). Retrieved February 28, 2012, from <http://jime.open.ac.uk/jime/article/viewArticle/2010-2/html>
- Mackie, C. J. (2008). Open Source in Open Education: Promises and Challenges. In Eds Ilyoshi, T. and Vijay Kumar, M.S., *Opening up education: the collective advancement of education through open technology, open content, and open knowledge* (pp. 119-131). Cambridge, Mass: MIT Press.
- McGreal, R. (2004). Learning objects: A practical definition. *International Journal of Instructional Technology and Distance Learning*, 9(1). Retrieved February 26, 2012, from <http://hdl.handle.net/2149/227>

Mitra, S. (2012). *Beyond the Hole in the Wall*. New York: TED Conferences, LLC.

Moore, A. (2002, Sep. - Oct.). Lens on the Future: Open Source Learning. *Educause*, n/a.

Retrieved February 15, 2012, from <http://net.educause.edu/ir/library/pdf/erm0253.pdf>

Moore, JTS (Director). (2002). *Revolution OS* [Documentary]. USA: Wonderview Productions.

Peters, M. A. (2008). The History and Emergent Paradigm of Open Education. *Open Education and Education for Openness* (pp. 3-16). Rotterdam: Sense Publishers.

Polletta, F., & Jasper, J. (2001). Collective Identity and Social Movements. *Annual Review of Sociology*, 27, 283-305. Retrieved February 15, 2012, from <http://www.jstor.org/pss/2678623>

Smith, M.S. and Casserly, C.M. (2006). The promise of Open Educational Resources. *Change*, Vol. 38, No. 5, pp. 8-17.

Tajfel, H. (1982). Social Psychology Of Intergroup Relations. *Annual Review of Psychology*, 33, 1-39

The Cape Town Open Education Declaration. (2007, September 1). *The Cape Town Open Education Declaration*. Retrieved February 6, 2012, from <http://www.capetowndeclaration.org/read-the-declaration>

UNESCO, Open educational resources | United Nations Educational, Scientific and Cultural Organization. (2002). *United Nations Educational, Scientific and Cultural Organization*. Retrieved February 15, 2012, from <http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/>

UNESCO. 2005. *Towards Knowledge Societies*. UNESCO World Report. Paris, UNESCO.

Weick, K.E. (1979). Commensurate complexity, and Over-determination vs. Occam's Razor, in
The social psychology of organizing, 2nd edition. Reading, Mass.: AddisonWesley Pub.
Co.

Wiley (2006). A Learning Objects Literature Review (Draft) <http://opencontent.org/blog/archives/277>

Wiley, D. (2008, March 28). What is Open Education? | iterating toward openness. *OpenContent*.
Retrieved February 4, 2012, from <http://opencontent.org/blog/archives/476>

Wiley, D. (2009, January 21). Introduction to Open Education. *iTunesU*. Lecture conducted from
BYU, Provo

Wiley, D., & Hilton III, J. (2009). Openness, Dynamic Specialization, and the Disaggregated
Future of Higher Education. *International Review of Research in Open and Distance
Learning Volume 10, Number 5., 10(5)*. Retrieved February 26, 2012, from
<http://www.irrodl.org/index.php/irrodl/article/view/768>

Wiley, D. (2010, March 6). Open Education and the Future. *TEDxNYED*. Lecture conducted
from TEDx, New York city.