International Review of Research in Open and Distributed Learning

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Volume 16, Number 5, September 2015

Special Issue: OER and MOOCs

URI: https://id.erudit.org/iderudit/1066304ar
DOI: https://doi.org/10.19173/irrodl.v16i5.2027

See table of contents

Publisher(s)

Athabasca University Press (AU Press)

ISSN

1492-3831 (digital)

Explore this journal

Cite this article

Ozturk, H. (2015). Examining Value Change in MOOCs in the Scope of Connectivism and Open Educational Resources Movement. *International Review of Research in Open and Distributed Learning*, *16*(5), 119–144. https://doi.org/10.19173/irrodl.v16i5.2027

Article abstract

Massive Open Online Courses (MOOCs) came to prominence with Open Educational Resources Movement (OERM). It was based upon the idea of libre in removal of some permission barriers and gratis in removing the price barrier (Suber, 2008) in learning resources. In line with the theoretical underpinnings of OERM, MOOCs embody primary characteristics of connectivist pedagogy which are autonomy, diversity, openness, and community participation. However, in time, moving away from its original philosophical and pedagogical values, new variations of MOOCs have emerged and new MOOCs have become more market oriented and are aligned with instructivist, cognitive, and behaviourist pedagogy. In an attempt to empirically examine the change in underlying values of the MOOCs, a survey method was employed by using a Connectivist Learning Environment Assessment Tool which was developed in the scope of this research. The tool could be useful for formulating and justifying a conceptual framework that enables us to reify the connectivist pedagogy and assess connectivist underpinnings of a learning environment including MOOCs. This research aims to contribute to MOOC studies against the background of previous knowledge from the Open Education and Connectivist fields.

International **R**eview of **R**esearch in **O**pen and **D**istributed **L**earning
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Abstract

Massive Open Online Courses (MOOCs) came to prominence with Open Educational Resources Movement (OERM). It was based upon the idea of libre in removal of some permission barriers and gratis in removing the price barrier (Suber, 2008) in learning resources. In line with the theoretical underpinnings of OERM, MOOCs embody primary characteristics of connectivist pedagogy which are autonomy, diversity, openness, and community participation. However, in time, moving away from its original philosophical and pedagogical values, new variations of MOOCs have emerged and new MOOCs have become more market oriented and are aligned with instructivist, cognitive, and behaviourist pedagogy. In an attempt to empirically examine the change in underlying values of the MOOCs, a survey method was employed by using a Connectivist Learning Environment Assessment Tool which was developed in the scope of this research. The tool could be useful for formulating and justifying a conceptual framework that enables us to reify the connectivist pedagogy and assess connectivist underpinnings of a learning environment including MOOCs. This research aims to contribute to MOOC studies against the background of previous knowledge from the Open Education and Connectivist fields.

Keywords: MOOCs; connectivism; open education resources movement; connectivist learning environment assessment tool

Introduction

Philosophical and Pedagogical Background of MOOCs

Ideas of Open Educational Resources Movement (OERM) advocating for free access to resources for learning, teaching, and research (Knox, 2013) underpinned the pedagogical design of Massive Online Open Courses (MOOCs). Andersen and Ponti (2014) define MOOCs as structured and organized OER in the form of a course with participation from educators or organizers. According to Siemens (2013), "openness" which is associated with (the first) connectivist MOOCs, is a cornerstone to innovation and creativity.

On taking a closer look at the OERM, underlying philosophy of this movement is inspired by the idea of the diminishing role of institutions which require enrolment to access education. In other words, "OER foregrounds and prioritizes 'learning' as the central concern of educational endeavors, considering its users to be 'participants' in rather than 'consumers' of education" (Wiley, 2006, cited from Knox, 2012, n.p.). On this point, there are two key concepts in defining the OER which could be summarized as liberty and gratis (Shareski, Swanson, Roberts & Downes, 2013). OER discussions revolve around the idea of free education since learning resources could be accessed by the public including disadvantaged groups. In his Guerrilla Open Access Manifesto, Aaron Swartz[1] (2008) opposes to the privatization and commodification of knowledge by identifying information as a power which embodies the scientific and cultural heritage of humans; this knowledge should not be monopolized by a handful of private corporations. In line with this, Karl Marx argues that the people who produce the goods should benefit the most from their production (Anderson, 2013). These assertions imply that third parties, such as publishers, should not be permitted to interfere with the knowledge gaining process by the way of unlinking the producers (e.g. authors) with the users (e.g. readers, learners).

In fact, discussions about intellectual property date back to the Age of European Enlightenment. As Hesse (2002) aptly notes

"The concept of intellectual property– the idea that an idea can be owned–is a child of the European Enlightenment. It was only when people began to believe that knowledge came from the human mind working upon the senses–rather than through divine revelation, assisted by the study of ancient texts–that it became possible to imagine humans as creators, and hence owners, of new ideas rather than as mere transmitters of eternal verities" (p.26).

[1] Aaron Swartz, who hanged himself on his 26 possibly due to $1 million fine and penalty of 35 years in prison as a result of downloading academic journal articles from JSTOR, is a leading open access advocate and has significant contributions to the advancement of open educational resources. Swartz was involved in the development of the web feed format RSS, the organization Creative Commons, and the social news site Reddit (http://en.wikipedia.org/wiki/Aaron_Swartz).

To sum up, open education is grounded in economic discourses (education as a commodity), moral (education as a common good), and social (education as a shared enterprise) (Deimann & Sloep, 2013, p.1). In this context, as Deimann and Sloep (2013) suggest, open education has heterogeneous philosophical roots but can be reconciled since they share common beliefs and ideas.

However, OERM draws criticism in the following points:

1) The concept of "openness" is under theorized in particular for the practices of self-directed learning,

2) Rejecting institutional authority is problematic in a sense that OER literature in fact affirms reputation of established institutions while asserting liberation from them,

3) "The diminishing of the role of pedagogy, in which OER will be aligned with an untheorized learner-centered model of education",

4) Deterministic assumptions about self-direction and autonomy, and

5) "(A)n alignment with the needs of capital" (Knox, 2012, n.p.).

In the scope of MOOCs which is the focus of this study, among these points which Knox draws attention, lack of pedagogical considerations in some respects raises the need for a pedagogical lens to examine MOOCs. As Knox (2012) explains, OER literature mainly concerns accessing resources and neglect the issues of "(h)ow teaching in higher education might translate into the model of independent, self-directed access to learning resources" (n.p.). In the same vein, Deimann and Farrow (2013) point out the need of a new pedagogical framework based on an open paradigm for more collaborative and participatory projects. In the light of these discussions, in this paper, connectivist theory will be utilized as a framework for approaching MOOCs. First MOOCs are associated with connectivist theory as an underlying pedagogical approach and thus titled as cMOOCs (Connectivist MOOCs). Furthermore, connectivism shares similar philosophical values with OERM. Finally, one of the first MOOCs is titled as Connectivism and Connective Knowledge offered by George Siemens and Stephen Downes who are pioneers of connectivist thought and applied this theory in their course. In the next section, connectivism will be explored so as to provide a pedagogical lens to the MOOCs.

Connectivism

Anderson and Dron (2011) define three generations of distance education pedagogy as cognitive-behaviourist, social constructivist, and connectivist pedagogy. Among these pedagogies, connectivism is the most recent pedagogy and is helpful for understanding learning in networks and in Web 2.0 settings. Siemens (2004) and Downes (2012) describe a network structure in which there are nodes (e.g. ideas, communities) and ties among these nodes. Learning in this network structure is described as a process of connecting specialized nodes or information sources.

So, what makes a learning environment connectivist? In the literature, there are misconceptions about connectivist learning and there are considerable assumptions about connectivism which are at odds. Therefore, in this paper, based on the seminal works of Downes (2012) and Siemens (2004) who are the pioneers of connectivism, characteristics of a connectivist learning environment are framed and summarized under the titles of connective knowledge, learning, semantic condition (diversity, autonomy, openness, connectedness), community participation, and role of a teacher in networked learning are expanded upon in the following sections. Framing the discussions through these aspects would be helpful in examining whether a learning environment accommodates connectivist features.

Connective Knowledge

Connectivism is grounded in an ontological view which assumes that, in addition to qualitative and quantitative knowledge, there is also distributed knowledge which is spread across a network of connections (Downes, 2012) and that knowledge rests in that diversity of opinions (Siemens, 2004). However, it is important to note that any distributed knowledge does not necessarily signify connectivist knowledge unless it adds value to where it is connected (Downes, 2012). Furthermore, according to Siemens (2004) connectivist knowledge is emergent, chaotic, fragmented, non-sequential, and contextualized.

In fact, connectivism provides us a lens through which to make observations about learning in a digital age which occurs from organic knowledge with a disseminating, growing, and social structure.

Learning

According to the connectivist principles developed by Siemens (2004, n.p.)

- Learning and knowledge rest in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right

> answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Learning is perceived beyond memorizing and knowledge transfer in connectivist view. Rather than learning the course content, networks, ties, and nodes take an important role in explaining learning. In line with this, "learning consists of the ability to construct and traverse those networks" (Downes, 2012, p.9).

Semantic Condition

After describing what learning is in a connectivist framework, it is equally important to understand what influences that learning. According to Downes (2012), "learning process is influenced by the four elements of the semantic condition (diversity, autonomy, openness, connectedness), that while memory is adaptive, it is not (necessarily) representative, and that learning, on this theory, isn't 'transferred', but grown anew by each learner" (p. 93). In networked learning, these elements point out democratic values. It is important to have semantic condition in a network as these values suggest a network which is more reliable, more stable, and can be trusted (Downes, 2012).

On taking a closer look at the semantic condition, diversity refers to individual differences in a network, such as network members who have various cultural backgrounds, expectations, prior knowledge, and differing ideas. Autonomy refers to the degree of freedom to make decisions. Self-regulated learning could be an example of autonomous learning where the learners make their decisions about their learning preference, such as choosing what to learn, planning, and evaluating their own learning and so on. Open Education refers to open content, teaching, and assessment (Downes, 2013) as discussed earlier in the paper. Finally, connectedness concerns implications of people being connected in a certain way rather than frequency of contact (Siemens, 2009).

Community Participation

In explaining network theory that informs connectivism, Downes (2012) refers to three aspects as knowledge, learning and community. In the sections above, the first two dimensions were discussed. As for the place of community in connectivism, knowledge and learning per se are not sufficient to comprehend a network theory. Knowledge is the building block of learning; what members learn informs the community and the knowledge created in that community in turn informs its members. In the same vein, Siemens (2004) points out the same cycle of knowledge development by suggesting,

"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 [the] individual" (n.p.).

So, Siemens and Downes emphasize not only the basic elements of network theory but also the cyclical knowledge development and learning in connectivism.

Role of a Teacher in Networked Learning

Exploring role of a 'teacher' in connectivist learning is challenging. In many instances teachers are defined as a critical friend, co-traveler (Anderson & Dron, 2011), and facilitator (Downes, 2012). Since the distributed and networked structure of knowledge in the digital age challenges the traditional view of education delivered within the borders of school, strict time periods, and content, the role of the teacher has been redefined in the context of the connectivist paradigm to include networked learning environments. According to Siemens (2010), the role of a teacher could be summarized as follows:

1. Amplifying. Teachers are considered as nodes to which learners would decide to listen and follow. Therefore, teachers draw attention to content elements, ideas, thoughts, messages, and so on.

2. Curating. Instead of delivering specific content, the teachers highlight the issues with their comments, posts, and personal reflections. Teachers provide learners with a variety of information sources.

3. Wayfinding and socially-driven sense making. Teachers guide their students in the manner of helping them find their way in their self-directed learning journey; thus helping them to make sense of complex information.

4. Aggregating. As knowledge is distributed across networks, it is important for teachers to utilize tools to aggregate that fragmented knowledge in order for a meaningful learning experience.

5. Filtering. Filtering is regarded as one of the most important roles of a teacher. Teachers help the learners by highlighting essential knowledge among a massive scale of information resources.

6. Modelling. Inspired by the apprenticeship learning method, modelling is important especially when knowledge "cannot be communicated and understood by lecture and learning activities alone" (n.p.).

7. Persistent presence. Persistent presence refers to the teachers' existence online to perform the aforementioned roles.

Re-visiting Connectivist MOOCs

In the sections above, the underlying philosophical and pedagogical background of MOOCs was discussed in the scope of OERM and connectivism in order to frame the MOOCs in its original form with its essential values. In this section, how MOOCs embody these values will be discussed to see its practical implications. Then, in the next section, current MOOC implications will be examined to uncover whether it has deviated in time from its original form, and if so, how?

In line with open education discourses, the teachers' and institutions' roles are diminished in MOOCs. Instead, as Liyanagunawardena, Adams and Williams (2013) suggest connectivity between the participants is facilitated by means of social networking and freely accessible online

resources. Here, OER takes an important place in particular in large-scale open learning as the learners heavily rely on the presented materials.

In typical MOOCs, massive participation is supported, that is to say on average several hundred to several thousand participants self-organize their participation take part in the course (McAuley, Steward, Siemens & Cormier, 2010; Downes, 2012). In a cMOOC, there is no prerequisite to take a course; educational resources are open to access and there is no fee.

A cMOOC embodies the primary characteristics of connectivism which are autonomy, diversity, openness, and interactivity (Cabiria, 2012). Participants are free to take the course based on their availability, are not assessed (by their peers) unless they wish to be, and the courses are open to anyone regardless of age, background, pre-knowledge, and so on. A detailed review of the implications of OER and connectivism will be discussed in the Discussion section.

Research Problem

In time, moving away from its original philosophical and pedagogical values, new variations of MOOCs have emerged. In the literature, new types of MOOCs have been classified as xMOOCs while original MOOCs have been renamed as cMOOCs.

Drawing on the literature, Adams, Yin, Madriz and Mullen (2014) explicate the underpinning learning theories of MOOCs as "connectivism (Bell, 2010; Kop, 2011), complexity theory (deWaard et al., 2011), and other socio-constructivist variations (Clarà & Barberà, 2013; Wegerif, 2013), which have also served to strongly differentiate dialogical, connectivist cMOOCs from more monological, instructivist xMOOCs" (p.203). In cMOOCs, the participants take part in creating the content whereas in xMOOCs curricula is structured and defined by the course designer. Generally, while in cMOOCs, the participants use, reuse, and redistribute the resources; in some xMOOCs, the participants are not allowed to do so.

In fact, Bates (2014) refers to the literature in which MOOCs are dealt with in a variety of forms. Bates summarizes these forms as "video-recorded lectures watched in isolation by learners" or "watched in co-located groups in a flipped classroom mode without instructor or tutorial support"; "MOOCs integrated into regular campus-based programs with some learner support" and finally cMOOCs, "using participatory and/or connectivist pedagogy" (p. 145). So, as it can be seen from the literature, there are now new forms of MOOCs which are more instructive and restrictive; participants are isolated and in some cases they need to pay a fee to get a certificate or fully access to the course. Since OERM inspired the emergence of the first MOOCs, as Peter and Deimann (2013) remark, there have been shifts from "pure openness" towards "pretended openness". MOOCs are now more massive but less open and more didactic (Siemens in an interview, Parr, 2013) and "free to (make) profit" (Rivard, 2013).

While there are studies asserting a shift in the original MOOCs and classify MOOCs with its different types (e.g. Bates (2014); Adams, Yin, Madriz & Mullen (2014)), Mackness (2013) reflects that some MOOCs, especially offered by word-leading campus-based universities, share similar practices with connectivist MOOCs and questions the blurring of boundaries between c and

xMOOCs by referring to hybrid MOOCs. For instance, she thinks that some xMOOCs encourage massive participation, establish communities of learners around them, include peer-review process, and so on. Regarding the entanglements with cMOOCs and xMOOCs, Clarà and Barberà (2013) note the assumption that underpinning pedagogy of the xMOOCs will be connectivism when these universities are forced to modernize their pedagogy. So, rather than focusing on either type of the MOOCs, or in other words the prefix of MOOCs, it is important to examine all existing MOOCs in order to uncover to what extent and in what ways existing MOOCs share the underpinning values of or deviate from connectivist open education theory.

On this point, it is important to highlight value change in MOOCs based on empirical analysis which in turn would be helpful to preserve its original form and to determine a possible course of action for future MOOCs.

In the light of the discussions above, in this study, the following two interrelated research questions will be addressed:

1. What makes a learning environment connectivist?

2. To what extent do the current MOOCs represent connectivist open education theory?

Method

The method of this research consists of two stages; first a Connectivist Learning Environment Assessment Tool (CLEAT) was developed for the purpose of framing the connectivist pedagogy as well as assessing a learning environment to see whether it has connectivist implications. Second, in order to examine the extent of current MOOCs' fidelity to connectivist pedagogy, a survey method was used by employing the assessment tool. Forty nine MOOCs were examined through the assessment tool.

Developing a Connectivist Learning Environment Assessment Tool (CLEAT)

As Anderson and Dron (2011) imply, "(c)onnectivist models are more distinctly theories of knowledge, which makes them hard to translate into ways to learn and harder still to translate into ways to teach" (p. 90). In many cases, connectivist theory remains abstract and it is difficult to make sense of its practical meanings in educational implications. The main purpose of this research is to examine whether current MOOCs still have connectivist implications as it was in its point of departure as suggested by the Open Educational Resources Movement. To this end, it is important to reify what connectivist theory means for practitioners, learners, and designers. Therefore, in order to investigate the first research question, that is "what makes a learning environment connectivist?", a connectivist learning environment assessment tool was developed.

Drawing on the literature and essentially seminal works of Siemens (2004, 2008, 2009, 2010, 2013) and Downes (2012, 2013), an assessment tool was formed (Appendix 1). Draft tool consists

of 41 items. There are five dimensions in the tool aiming to measure: "Semantic condition" (12 items); "Role of a teacher/facilitator" (7 items); "Connective knowledge" (3 items); "Learning" (13 items); and "Community participation" (6 items).

Thirteen subject matter experts (seven Ph.D. holders and six Ph.D. students), who are knowledgeable about connectivist theory, commented on and rated the items in the tool through three, Likert point as (item is) "essential", "not essential", and "useful but not essential". The tool took the final form after some items were removed drawing on the content validity analysis result.

Examining MOOCs with the CLEAT

In order to address the second research question, "To what extent do the current MOOCs represent connectivist open education theory?", a sample of MOOCs was randomly chosen from ongoing and available MOOCs on "designated platforms" and "massive networks" (Mackness, 2013) such as Coursera, EdX, Khan Academy, P2PU, and change.mooc.ca. An in depth examination was taken on assessing the MOOCs. Ongoing 15 courses on Khan Academy, 15 courses on Coursera, 15 courses on EdX and 4 courses on massive networks were examined. At the time of the research, there was limited number of MOOCs on massive networks apart from the major MOOC providers on designated platforms; therefore, samples of the MOOCs on these networks examined in the present research were low.

Data on the second research question consists of each course's score on CLEAT and also the researcher's notes.

Data Analysis and Discussion

Developing a Connectivist Learning Environment Assessment Tool (CLEAT)

The main problem with connectivist theory is that, to some extent, it is difficult for practitioners to fully comprehend its implications in educational settings. Therefore, while developing a connectivist assessment tool to see whether a learning environment is inspired by a connectivist theory or not, it is important to discuss the tool's contents with the subject matter experts (SME). In this context, rather than validating the tool with hundreds of student raters, opinions of experts on the scale items were asked to ensure its content validity as experts are able to guide with their knowledge on connectivism.

When analyzing the items on the tool, Lawshe's (1975) formula, which is suitable for analyzing expert responses (rates), was used. The formula is:

$$CVR = \frac{n_e - N/2}{N/2}$$

CVR = content validity ratio,

n_e = number of SME panelists indicating "essential",

N = total number of SME panelists.

Veneziano and Hooper (1997) indicate that minimum value of the content validity ratio for significance at $p<0.5$ is 0.54 for 13 panelists (See Table 1).

Table 1

Minimum values of the content validity ratio for significance at p<0.5

Number of Panelists	Minimum Value	Number of Panelists	Minimum Value
5	0.99	13	0.54
6	0.99	14	0.51
7	0.99	15	0.49
8	0.78	20	0.42
9	0.75	25	0.37
10	0.62	30	0.33
11	0.59	35	0.31
12	0.56	40+	0.29

After applying Lawshe's formula on the data, results of the analysis show that 28 items in the draft tool (Appendix 1) meet the requirement of content validity ratio as can be seen in Table 2.

Table 2

CVR value of each item

Item	CVR	Item	CVR	Item	CVR	Item	CVR
I1	0,69*	I12	0,23	I23	0,69*	I34	0,84*
I2	0,84*	I13	0,69*	I24	0,23	I35	0,84*
I3	0,84*	I14	0,69*	I25	0,23	I36	0,69*
I4	-0,07	I15	0,69*	I26	0,38	I37	0,84*
I5	0,38	I16	0,38	I27	0,69*	I38	1*
I6	0,69*	I17	0,69*	I28	0,69*	I39	0,69*
I7	0,69*	I18	1*	I29	0,23	I40	0,69*
I8	0,69*	I19	0,38	I30	0,69*	I41	0,69*
I9	0,69*	I20	0,38	I31	0,69*		
I10	0,23	I21	0,84*	I32	0,38		
I11	0,84*	I22	0,07	I33	0,84*		

It is important to note that the SMEs rated the items not only for their relation to connectivist learning but also for their power to assess a learning environment. Furthermore, three experts suggested to split Item 18 ("Learning and Knowledge Rest in Diversity of Opinions") into two parts as this item measures two different dimensions on the tool (Learning dimension and Knowledge dimension). Therefore, in the final form, 29 items remained. As could be seen in Appendix 2, there are nine items in the "Semantic condition" dimension, six items in the "Role of a teacher/facilitator" dimension, 2 items in the "Connective knowledge" dimension, seven items in the "Learning" dimension and five items in the "Community participation" dimension. Items in the final form are measured by 5 point Likert as (Never=0, Rarely=1, Sometimes =2, Most of the Time=3, and Always =4). The minimum score on the tool consisting of 29 items is 0 while the maximum score is 116.

Examining MOOCs with the CLEAT

The CLEAT was administered to 49 ongoing and available MOOCs. The analysis was run by calculating the score of individual MOOCs based on the dimensions of the tool and each MOOCs' overall score as could be seen in Table 3.

Table 3

Individual and average scores of MOOCs on CLEAT

	Overall Score	DIMENSIONS				
		Semantic Condition	Role of a Teacher	Connective Knowledge	Learning	Community Participation
MOOC 1	102	32	22	8	23	17
MOOC 2	89	27	21	5	20	16
MOOC 3	90	30	22	5	19	14
MOOC 4	99	31	24	4	24	16
MOOC 5	95	34	21	5	20	15
MOOC 6	91	35	21	3	19	13
MOOC 7	68	27	13	2	13	13
MOOC 8	60	25	16	1	9	9
MOOC 9	87	31	21	3	17	15
MOOC 10	80	28	22	3	15	12
MOOC 11	79	24	20	4	20	11
MOOC 12	74	27	19	2	15	11
MOOC 13	70	25	19	1	10	15
MOOC 14	70	27	18	2	11	12
MOOC 15	71	28	19	1	11	12
MOOC 16	58	20	16	0	10	12
MOOC 17	92	26	24	2	20	20
MOOC 18	57	27	6	3	9	12
MOOC 19	82	30	19	3	15	15
MOOC 20	80	31	19	3	14	13
MOOC 21	61	29	11	2	8	11
MOOC 22	75	31	15	5	13	11
MOOC 23	85	30	21	6	14	14
MOOC 24	82	29	19	5	15	14
MOOC 25	90	30	10	8	22	20
MOOC 26	91	29	20	2	20	20
MOOC 27	111	36	24	7	24	20
MOOC 28	70	22	19	0	15	14
MOOC 29	104	32	23	5	24	20
MOOC 30	69	25	17	1	15	11
MOOC 31	69	25	17	1	15	11
MOOC 32	87	29	20	6	18	14
MOOC 33	104	32	23	5	24	20
MOOC 34	47	17	15	1	6	8
MOOC 35	106	33	24	8	22	19
MOOC 36	58	19	17	1	10	11
MOOC 37	60	18	18	2	11	11
MOOC 38	76	23	18	6	18	11
MOOC 39	64	22	19	0	12	11
MOOC 40	61	19	17	1	13	11
MOOC 41	57	23	15	1	9	9
MOOC 42	63	24	10	6	11	12
MOOC 43	19	15	1	0	3	0
MOOC 44	44	15	12	2	8	7
MOOC 45	65	26	14	4	11	10
MOOC 46	116	36	24	8	28	20
MOOC 47	116	36	24	8	28	20
MOOC 48	96	32	16	8	23	17
MOOC 49	101	33	15	8	25	20
Average Scores of the MOOCs	**78,39**	**27,24**	**17,96**	**3,61**	**15,9**	**13,67**
Score scales	**0-116**	**0-36**	**0 - 24**	**0 -8**	**0 -28**	**0-20**

Scores on Table 3 show that average scores of the MOOCs are slightly above average based on the Connectivist Learning Environment Assessment Tool. Although to some extent influence of connectivist pedagogy could be observed in the current MOOCs, a detailed look at the dimensions of the pedagogy would be helpful in reflecting the direction of change. In the section below, characteristics of the MOOCs will be examined based on the sub-dimensions on the scale and open education paradigm.

Semantic Condition

In almost all of the MOOCs, massive participation was supported as expected and interactions among members were promoted. This leveraged the scores of the MOOCs. However, there was a significant tendency to marketise the MOOCs and this lowered the scores on semantic conditions. It was observed that while original MOOCs were completely free, now it is optional to "audit" a course and there is a charge to get a certificate. There are now campaigns echoed literary as "Pay as you go" selling courses to the students one-by-one. This proves that learning praxis on MOOCs has been commodified. It is noteworthy to rethink this deviation of the current MOOCs beyond their scores. The classification of the participants (the ones who pay for the course and take the course for free) takes us back to the neoliberal discourses of which OERM stands against. In the context of the job market, research shows that employers perceive taking MOOCs as an indication of employees' personal attributes such as motivation and a desire to learn in hiring decision (Radford, 2014). This points out the importance of MOOCs for the students who can afford, especially certificated courses, and who cannot, raising the question of equality in terms of gratis and where MOOCs are headed to.

One might think that MOOC projects need funding and therefore they must charge a fee; however, Wiley and Gurrell (2009, citing from Downes (2006)) provide ten models to support open education projects. For instance, a membership model for organizations to join a consortium; a governmental model which proposes government agencies fund OER projects; a donations model which requests donations from its community members, as well as, other seven sustainability models could enhance economic sustainability of the cMOOCs.

A further point about certification is that, by looking at the scores from each dimension stated in Table 3, it could be seen that the MOOCs have now begun serving the needs of financial sources of the Universities by awarding participants with certificates which in turns helps the "elite" universities compete in the market by maintaining their reputation and making profit by selling the certificates. This result contradicts to the OERM's claims to independence from the institutions.

Role of a Teacher (Facilitator)

It is noteworthy that in all of the MOOCs providers, it was common that the facilitators draw attention of the participants to the important concepts and ideas, clarify discussions and content via extracting patterns, exclude non-useful information in the networks, and provide the

participants with learning resources. These aspects meet the basic assumption of the connectivist MOOCs.

However, in the MOOCs where the role of a teacher was diminished, the learning environment became like an archived MOOC, as the differentiation between archived and live MOOCs was made by Campbell, Gibbs, Najafi and Severinski (2014), the courses lacked of cohort presence, instructional support, and collaborative learning; The teachers were enlivening the learning atmosphere and pointing out the fundamental contents although the learners heavily relied on their own engagement and collaboration with other learners throughout the course.

Connective Knowledge

Among the dimensions on CLEAT, MOOCs received the lowest scores from the Connective Knowledge dimension. Knowledge was examined by investigating its structure as chaotic, fragmented, non-sequential, and contextualized. Also, whether knowledge rested in diversity of opinions was researched.

As expected, there were many knowledge sources on MOOCs; however, it is noteworthy that knowledge presented by the facilitator in videos as a main source was highly structured like in a face-to-face settings. In a similar fashion, sources on collaborative learning tools such as wikis were also structured and mostly sequential.

As for the alternative knowledge sources to those facilitators', in particular in discussion forums and in outcomes of most of the educational activities which required learner collaborative engagement, it was seen that knowledge rested in diversity of opinions.

Learning

Learning trajectories of the students enrolled in three MOOC providers were mainly determined by objectives of the course. The findings showed that in terms of learning, in line with the objectives of the course, MOOCs had the potential to help students develop their capacities about the subject matter, to nurture meaning making and connections, and to learn from each other.

However, on CLEAT, the MOOCs scored low concerning the students' participation in a variety of networks. Essentially, the students were members of the forums or wikis embedded in the MOOCs whereas their participation in external networks was not supported in most of the courses.

Also, in 44 MOOCs, it was not possible for the learners to be part of creating content and structure. As mentioned before, the courses were highly structured. In five of the MOOCs, students were not allowed to administer to the course content and structure but partially, their opinions in the discussion forum or in equivalent tools were taken into account as feedback by the facilitators.

Community Participation

As discussed earlier, the students' participation in external networks was not significantly supported by MOOCs nor was their community participation within the MOOCs. Consistent with the dynamics of MOOCs, the students were able to join and leave a learning network whenever they wished and, most of the time, they were sharing common learning interest; however, they were occasionally given the responsibility of promoting each other's participation, happening mainly through peer-assessments and forum discussions. Furthermore, it was difficult to claim in most of the MOOCs that what students learn informs the community in which they are a part of and the community's collective knowledge, skill and perspective inform its member. It could be because MOOCs are usually run over a short period of time; within that limited time, it is not easy to foster spirit of community.

However, if participants in MOOCs are not a part of a community but merely a constituent of massiveness, then a relationship between the digital economy and the 'number' of the students becomes evident. Massiveness means profit given that each student needs to pay a fee to fully utilize the course and gain a certificate. As McAuley, Steward, Siemens and Cormier (2010) remark, "(t)he digital economy relies not just upon the formal infrastructure and services identified in the government's Consultation Paper, but on open, global networks of people whose connections carry capital exchange potential, whether of direct goods and services, information, simple friendship, or knowledge-building opportunities" (p.34).

Also, given that designing MOOCs as a pre-course process requires a great amount of time, during the course facilitators could be daunted with the workload while delivering the content which may cause them to pay less attention to the community aspect of learning. In this regard, Hollands and Tirthali (2014) refer to the time allocation of George Siemens who was a co-facilitator of an influential MOOCs (CCK08). Siemens estimated the time burden for CCK08 development and delivery as 770 hours at the high end. This demonstrates the challenging reality for facilitators to allocate time in order to foster community participation.

Conclusion

This paper has attempted to address the change in underlying values of MOOCs through time. To this end, in this research, a Connectivist Learning Environment Assessment Tool (CLEAT) was developed for the purpose of framing and reifying connectivist pedagogy, as well as, assessing a learning environment to see whether it has open connectivist learning implications.

Findings based on the data obtained via CLEAT show that current MOOCs have been moving away from its original philosophical and pedagogical foundations. In overall evaluation, on the average, MOOCs were scored 78,39 whereas the maximum score was 116. Given the similar results obtained from the sub-dimensions of the tool, it could be suggested that current MOOCs partially embody open connectivist learning principles.

Drawing on the data, some highlighted points and suggestions for future studies are as follows:

- As a fundamental discourse of Open Educational Resources Movement, "libre and gratis" were not significantly ensured in current MOOC implications. It is difficult to claim that current MOOCs are underlined with democratic values such as "libre". For instance, course design is inspired by didactic teaching (e.g. students are not allowed to decide course content) and certification system has rapidly been taking place which requires students to pay fee. Siemens (2013) suggests that current popular MOOCs are destroying open education. In that sense, future studies should focus on how to maintain free MOOCs based on financial models and pedagogies pertains to MOOCs settings in order to foster libre.

- It was dramatically observed that the knowledge structure on MOOCs was not chaotic, fragmented, and non-sequential as suggested in connectivism. In particular, videos as main sources of MOOCs modelled face-to-face courses. Future studies could specifically deal with how to reflect connectivist knowledge in design of the MOOCs.

- In considerable number of the MOOCs, community participation was ignored. Whereas in terms of community, in MOOCs it is aimed to "exploit the 'network effect', which means the value of a networked experience increases as more people make use of it. The aim is to engage thousands of people in productive discussions and the creation of shared projects, so together they share experience and build on their previous knowledge" (Sharples et al., 2014, p.3). However, given the number of the students, workload and time constraints of the facilitators, research papers are needed to develop MOOCs which mediate the students' community participation, as well as, challenge the realities of the facilitators.

- MOOCs which were reviewed in this research could be expanded and compared based on different variables such as connectivism and country of origin for individual MOOCs. As Bulfin, Pangrazio and Selwyn (2014) remark, "there is clearly room for additional comparative work that maps the discursive constriction of MOOCs in other national contexts – such as the largely publically-funded Scandinavian and central European education systems, as well as emerging higher education systems in regions such as Africa and the Middle East" (p. 301).

- Implications for future research are around whether xMOOCs will become more like cMOOCs over time in order to improve their completion rates and learning outcomes.

- Another area of future research is around whether existing MOOCs will become OER rather than fully copyrighted as most are now.

- Finally, the tool could be further developed in different learning settings and be adopted specifically for the MOOCs. Also, the tool could be improved through the discussions on connectivism.

Acknowledgments

I would like to thank the IRRODL journal reviewers for their constructive and helpful feedback during the review process.

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Appendix 1

Draft Connectivist Learning Environment Assessment Tool rated by the subject matter experts and the Literature from which the item is originated.

	Essential	Not Essential	Useful but not essential	Comments	Literature
Participants are able to access knowledge resources					
In the learning environment, interactions between participants are supported					
In the learning environment, collaborative learning is supported					
Participants are autonomous					Downes (2012)
Participants decide what to learn					
In the learning environment, individual diversity is supported					
The course is open to everyone					
The course supports massive participation					Downes (2011)
In the learning environment, self-directed learning is supported					Kop (2011)
Participants are aware of the presence of others in the learning environment					
The facilitator draws attention to important concepts and ideas					Siemens (2004)
The facilitator provides the participants with learning resources					
The facilitator assists participants to use social networking for their doubts					Cormier & Siemens (2010); Rodriguez (2012); Siemens (2004)
The facilitator clarifies discussions and content via extracting patterns					
The facilitator helps participants to be able to exclude non useful information in the networks					
The facilitator modeling shows successful information and interaction patterns					
The participants sense the presence of the facilitator					
Learning and knowledge rest in diversity of opinions					Siemens (2004)
Learning is a process of connecting specialized nodes or information sources					
Learning may reside in non-human appliances					
Learning process contains learning in networks consist of nodes (e.g. organization, information, people) and ties among these nodes					
Capacity to know more is more critical than what is currently known					
Meaning making and connections are nurtured and maintained in order to facilitate continual learning					

Connections between fields, ideas, and concepts are clear					
Knowledge is emerging and accurate					
Knowledge is distributed across a network of connections					Downes (2012)
Knowledge is chaotic, fragmented, non sequential and contextualized					Anderson (2010)
Participants are able to learn through their ability to construct and traverse among networks					Downes (2012)
Participants are given a learning task					
Participants are able to take an active role in learning activities					Andersen & Ponti (2014) Siemens (2008); Kumpulainen et al., (2009)
Participants are enabled to be part of creating both content and structure					
Curriculum is not fully defined before interaction with learners					
Participants are given responsibility for promoting each other's participation					
What participants learn informs the community in which they are a part of					Downes (2012)
The community's collective knowledge, skill and perspective inform its member					Downes (2012); Siemens (2004)
Participants share common learning interest					Kop & Hill (2008)
Participants are able to join and leave a learning network whenever they wish					Downes (2012)
Participants are able to develop their capacities					
Courses are free of charge					
Course materials are available for reuse					Andersen & Ponti (2014)
Participants can redistribute course materials (share copies of the original, revised or remixed content)					Amiel (2013)

Appendix 2

Connectivist Learning Environment Assessment Tool

	4	3	2	1	0
Semantic Condition					
1. In the learning environment, individual diversity is supported					
2. In the learning environment, self-directed learning is supported					
3. In the learning environment, interactions between participants are supported					
4. In the learning environment, collaborative learning is supported					
5. The course is open to everyone					
6. Courses are free of charge					
7. Course materials are available for reuse					
8. Participants can redistribute course materials (share copies of the original, revised or remixed content)					
9. The course supports massive participation					
Role of a teacher/facilitator					
10. The facilitator draws attention to important concepts and ideas					
11. The facilitator assists participants to use social networking for their doubts					
12. The facilitator clarifies discussions and content via extracting patterns					
13. The facilitator helps participants to be able to exclude non useful information in the networks					
14. The participants sense the presence of the facilitator					
15. The facilitator provides the participants with learning resources					
Connective Knowledge					
16. Knowledge is chaotic, fragmented, non sequential and contextualized					
17. Knowledge rests in diversity of opinions					
Learning					
18. Learning rests in diversity of opinions					
19. Learning process contains learning in networks consist of nodes (e.g. organization, information, people) and ties among these nodes					
20. Meaning making and connections are nurtured and maintained in order to facilitate continual learning					
21. Participants are able to learn through their ability to construct and traverse among networks					
22. Participants are able to develop their capacities					
23. Participants are able to take an active role in learning activities					
24. Participants are enabled to be part of creating both content and structure					
Community Participation					
25. What participants learn informs the community in which they are a part of					
26. The community's collective knowledge, skill and perspective inform its member					
27. Participants share common learning interest					
28. Participants are able to join and leave a learning network whenever they					

wish					
29. Participants are given responsibility for promoting each other's participation					

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