

Patterns of Engagement in Connectivist MOOCs

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Abstract

Connectivist massive open online courses (cMOOCs) represent an important new pedagogical approach ideally suited to the network age. However, little is known about how the learning experience afforded by cMOOCs is suited to learners with different skills, motivations, and dispositions. In this study, semi-structured interviews were conducted with 29 participants on the Change11 cMOOC. These accounts were analyzed to determine patterns of engagement and factors affecting engagement in the course. Three distinct types of engagement were recognized – active participation, passive participation, and lurking. In addition, a number of key factors that mediated engagement were identified including confidence, prior experience, and motivation. This study adds to the overall understanding of learning in cMOOCs and provides additional empirical data to a nascent research field. The findings provide an insight into how the learning experience afforded by cMOOCs suits the diverse range of learners that may coexist within a cMOOC. These insights can be used by designers of future cMOOCs to tailor the learning experience to suit the diverse range of learners that may choose to learn in this way.

Keywords: massive open online course (MOOC), connectivist massive open online course (cMOOC), connectivism, lurking, networks, active participation, passive participation

Introduction

Pedagogical models of learning online have been extensively theorized, particularly with respect to the interrelationship of technology and pedagogy ([Anderson & Dron, 2010](#); [Garrison, 1997](#); [Kanuka & Anderson, 1999](#)). As we approach near ubiquity of networked connections between people, content, and tools (reflecting the "networked society" described by Castells, 1996), researchers such as George Siemens have proposed new pedagogical approaches based on the principles of connectivism ([Siemens, 2005](#)), through which learning is viewed as residing in the connections that exist between people and digital artifacts within this ubiquitous network. One example of connectivist pedagogy in action is the massive open online course (MOOC) format pioneered by Siemens along with his colleague Stephen

Downes, first in the [Connectivism and Connected Knowledge 2008 \(CCK08\)](#) course (Downes, 2008) and thereafter in many subsequent courses including the [Change11](#) course that forms the basis of this study. These MOOCs, known as connectivist or cMOOCs, focus on knowledge creation and generation rather than "knowledge duplication" (Siemens, 2012, para. 3). In cMOOCs, the learners take a greater role in shaping their learning experiences than in traditional online courses, while facilitators focus on fostering a space for learning connections to occur. While cMOOCs can empower learners to take control of their learning, there remains a question about how the learning experience afforded by these cMOOCs is suited to learners with different skills, motivations, and dispositions. As cMOOCs are a relatively new phenomenon, there are few studies that have explored these issues (e.g., [Kop & Fournier, 2010](#); [Mackness, Mak, & Williams, 2010](#)). The overall aim of this study is to address this lack of empirical data.

This study focuses on two research questions:

- 1) What patterns of engagement exist within the Change11 cMOOC course?
- 2) What principal factors mediate this engagement?

By gaining a deeper insight into the patterns of engagement in cMOOC courses, this study seeks to provide an insight into how future cMOOCs can be designed to better support the learning needs and expectations of the wide range of learners that coexist within cMOOCs. The paper begins with a review of relevant literature, focusing on existing research examining the learning experience in cMOOCs. Next, the Change11 course context is described, followed by a description of the methodology adopted in this study and the sample studied. The study findings are then presented and discussed. Finally, recognizing the limitations of this study, the implications of these findings for research and practice are discussed, particularly in relation to the design of future cMOOC learning experiences.

Literature Review

Connectivist MOOCs emerged initially as an instantiation of the pedagogic principles of connectivism developed by Siemens and Downes, and their first MOOC, [CCK08](#), naturally explored the topic of connectivism as it attracted participation from learning researchers and practitioners who had been following the evolution of these ideas. Subsequent large scale cMOOCs, such as [Personal Learning Environments Networks and Knowledge \(PLENK 2010\)](#) and [Connectivism and Connected Knowledge 2011 \(CCK11\)](#), have continued in the same vein, exploring similar topics and attracting participants eager to experience the cMOOC format as well as the course content itself. This has led to the emergence of a rather unusual research base where a small amount of empirical research, published in niche journals and peer reviewed conferences, is supplemented by a large body of more anecdotal and reflective research published outside the traditional peer-reviewed journal system. To date, the key empirical research has been carried out by three groups of researchers: [Fini \(2009\)](#), [Mackness et al. \(2010\)](#), and Kop and her colleagues ([Kop, 2011](#); [Kop & Fournier, 2010](#); [Kop, Fournier, & Mak, 2011](#)), exploring the cMOOCs listed above.

Software tools for discovery, connection, and co-creation are a fundamental component of cMOOCs, together constituting the platform through which the course is delivered. In his study, [Fini \(2009\)](#) focused on the technological dimension of CCK08, exploring participants' perceptions of the course toolset as well as their views on the course. The research showed that one course component, *The Daily* newsletter, was valued by participants who used it as a tool to filter and organize their participation in the course, but that other tools, such as the discussion forums provided by [Moodle](#), were viewed less positively. In addition, Fini's research highlighted digital literacy and English language proficiency as key skills needed to participate effectively in the course. The study also provided evidence of different behavior patterns being exhibited by course participants based on their personal objectives, backgrounds, and levels of engagement. As the first cMOOC, CCK08 can be seen as a prototype; and it is interesting to note that subsequent cMOOCs designed by Siemens and Downes adopted different toolsets, specifically ending the use of Moodle as a locus for discussion forums. This had the effect of moving discussion and interaction to blog posts and other spaces controlled by the learners, following the concept of the personal learning environment introduced by [Wilson et al. \(2007\)](#).

[Mackness et al. \(2010\)](#) also studied the CCK08 course, focusing on the four key characteristics of connectivist online courses suggested by [Downes \(2009\)](#): *autonomy*, *diversity*, *openness*, and *connectedness/interactivity*. Mackness et al.'s study, conducted by survey and e-mail interview, identified inherent tensions between these characteristics. The presence of these tensions raises the question of

whether all four characteristics can be accommodated within the concept of a *course* in the traditionally understood sense, where the term creates expectations of structure, moderation, and support.

Research by Kop and associated researchers focused on the PLENK2010 cMOOC and carried on to examine the CCK11 cMOOC. This research focuses on the learning experience, and in particular on self-directed learning, asking whether cMOOCs facilitate the occurrence of self-directed learning. [Kop and Fournier \(2010\)](#) used quantitative (surveys) and qualitative (ethnography) data, supplemented by social network analysis to develop an understanding of autonomous learning within the PLENK2010 cMOOC. The research used [Bouchard's \(2009\)](#) four-dimensional model of learner control (*conative, algorithmic, semiotic, and economic*) to explore how motivation and confidence, the structure of learning, the delivery environment, and the perceived value of learning influenced learning strategies used by participants within the course. The study highlights additional factors necessary for learning in cMOOC type environments, principally the critical literacies essential to efficiently evaluate the large quantities of information present in a cMOOC – including an open mindset, the ability to learn cooperatively with others, and heightened critical analysis skills. In another paper based on the same study, [Kop \(2011\)](#) focuses on activities typical of cMOOC (or network)-based learning: *aggregation, relation, creation, and sharing*. The active and collaborative nature of these activities, similar to other classifications, such as the 4C learning behaviors (*consume, connect, create, and contribute*) identified by [Littlejohn, Milligan, and Margaryan \(2011\)](#), emphasize the importance of learning as a participatory process ([Sfard, 1998](#)) in the context of networked informal learning. [Kop \(2011\)](#) argues that to learn effectively in connectivist environments, learners must have key critical literacies such as those outlined above to be able to engage and participate, and have the confidence and competence to use the tools that mediate the key learning interactions that occur.

The [Kop \(2011\)](#) study also highlights the different types of learning approaches observed in the PLENK2010 cMOOC, recognizing the large number of lurkers ([Rovai, 2000](#)) who were present in these courses. In a third paper based on PLENK2010 but also incorporating data from the CCK11 cMOOC, [Kop et al. \(2011\)](#) return to the question of the underlying technology and explore whether specific learning environment designs can support effective learning in cMOOCs, arguing that structures must, at least to some extent, be emergent, and owned by the participants rather than imposed by the facilitators.

These studies have begun to provide a base of empirical data representing the learning that occurs in cMOOCs, but there is widespread recognition that more empirical research is urgently needed, particularly given the current widespread interest in the broad spectrum of MOOCs ([Daniel, 2012](#)). There is still a lack of data, drawn from too few courses, with a limited range of methodologies. This study seeks to build on these studies, examining a different course, the Change11 cMOOC, and using a different method (interview and survey instrument combined), to develop a greater understanding of the different patterns of engagement that coexist within cMOOC courses. Of particular interest is the nature of the networks these participants utilize to support their learning and the different factors that affect participation and engagement.

Course Context

The [Change11](#) course was a large-scale cMOOC running from September 2011 to May 2012, organized and facilitated by George Siemens, Stephen Downes, and Dave Cormier. Over 35 weeks, participants were introduced to the work of a range of instructional design researchers and practitioners. Registration was open and course delivery was supported through a variety of technologies, principally a daily e-mail newsletter and online synchronous seminars delivered via the [Elluminate](#) platform. The course attracted more than 2,300 participants. An e-mail newsletter called [The Daily](#) communicated course announcements and content from presenters, while also aggregating blog posts and tweets from participants marked with the hashtag "#change11." This hashtag, along with self-organized spaces such as a [Change11 group](#) on [Facebook](#) and a multi-author blog associated with the course, provided a universal means of discovery of course related blog posts and content.

Method

The findings reported here represent one component of a larger study examining self-regulated learning behavior within the Change11 cMOOC. Participants for the study were recruited via an invitation and study description included as the first item in [The Daily e-mail sent to everyone registered for the Change11 cMOOC during Week 17 of the course](#). Thirty-five individuals from a total of 2,300 registered learners agreed to participate. Study participants were initially invited to complete a short [online survey](#).

The survey used items adapted from a number of existing self-report self-regulated learning (SRL) instruments ([Barnard, Lan, Paton, & Lai, 2009](#); [Gijbels, Raemdonck, & Vervecken, 2010](#); [Maclellan & Soden, 2006](#); [Pintrich, Smith, García, & McKeachie, 1991](#); [Schraw & Dennison, 1994](#); [Toering, Elferink-Gemser, Jonker, van Heuvelen, & Visscher, 2012](#)) to enable the researchers to derive SRL profiles for each participant. The survey also collected demographic information (country of residence, employer, and discipline/field) and asked respondents about their experience of previous MOOCs. From the initial sample of 35, 29 study participants were able to subsequently take part in a one-hour [semi-structured interview](#) via [Skype](#), which explored various aspects of participation including motivation, goal-setting, and planning strategies, as well as exploring study participants' existing and emergent learning networks, their use of tools to support their learning, and their perceptions of their own participation in the course. Interviews were transcribed and stripped of identifying information. Transcripts were analyzed and a combination of predefined and emergent codes used to categorize the data. Ethical standards for the study were adopted in accordance with local regulations: all participants were provided with information about the study and how their data would be used, and were assured confidentiality and anonymity in any published work. Participants were asked to formally indicate their consent and were free to withdraw at any point.

Sample

Twenty-nine course participants out of 2,300 registrants on the course were interviewed in this study. Although a small number as a proportion of the total registrants, the sample is robust and appropriate for a qualitative study where a minimum sample of 12 is considered acceptable ([Guest, Bunce, & Johnson, 2006](#)). Everyone registered for the course received the e-mail that included the invitation to participate, so all those registrants who were active at Week 17 (midway through the course) would see the invitation. One limitation of the sampling procedure used is that anyone who had stopped actively following the course by this point would not have participated in the study. This limitation will be discussed in the results and discussion sections. The overarching topic of the cMOOC was instructional design, and all participants were either learning professionals (24, employed as lecturers, teachers, or instructional designers), or graduate students (five). Twelve of 24 learning professional participants were from the higher education sector, while 11 were drawn from the K-12 or community college sector. One participant was employed to support learning in a workplace outside the education sector. Eighteen of 29 participants were female, with 11 being male. Twenty of 29 participants had studied in previous cMOOCs.

Results

This study addressed two research questions: "What patterns of engagement exist within the Change11 cMOOC course?" and "What principal factors mediate this engagement?" These questions are now addressed in turn.

Patterns of Engagement

The semi-structured interview questions explored the topic of engagement in the course in a number of ways. Questions regarding motivation to do the course were complemented by questions exploring participation behavior. Finally, some questions were designed to probe the makeup of each respondent's personal learning network (their primary networks). Analyzing the responses to these questions allowed the authors to detect a number of different patterns of engagement with the course that are presented in this section.

Three distinct levels of engagement exhibited by the participants were identified in this study: *Active participants*, *lurkers*, and *passive participants*. Within these three levels, one key internal difference was observed: the location of the primary network for each individual, which might be internal or external to the course. Table 1 shows the number of participants in each category.

Table 1. *Engagement and primary networks for the Change11 MOOC*

		Primary Network for this Course			
		Internal	External	None	Total
Level of Engagement	Active Participant	12	0	0	12
	Lurker	5	4	4	13
	Passive Participant	0	0	4	4
	Total	17	4	8	29

The different categories are described in turn below.

- **Active participants.** The first group identified by this analysis (12 of 29) was a group described as *active participants*. These participants have adapted well to the connectivist pedagogy of cMOOCs, maintaining active blogs and [Twitter](#) accounts, actively and regularly discussing the course. All these active participants had formed wholly or primarily internal networks, connecting with other learners through Twitter and blogs. The live Elluminate sessions represented a key opportunity to make connections and widen their network. One participant, from South America, described the buzz of the chat sessions accompanying the live Elluminate sessions as follows: *"You can read the comments of people who are participating from different places and they give links to things that they are doing or they think while you hear what is happening"* (Participant 20). Not all active participants attended the live sessions (for reasons such as impractical scheduling in their time zone), but these sessions did seem to be an important focus for those who could attend.

Active participants were highly motivated to persist with the course and were able to overcome challenges in the course that might have proved a barrier to participation for others. For example one participant described how the live Elluminate sessions were sometimes confusing, and how she overcame this challenge:

"Yes I do, I found that when I was coming in cold to those speakers I was totally lost. So I had to come up with some short, sharp, effective strategies. First one being I'll check out the person on YouTube, I need to be able to get into the same space about what they're talking about, so at least I've got some sense of who they are and what they're going on about. So that was one strategy I used." (Participant 9)

Most active participants were energetic bloggers and Twitter users, using these tools as their main mechanism of communication. Active participants recognized that full participation entailed more than merely broadcasting ideas (creating tweets and blog posts) and had developed strategies to encourage connection with other participants through commenting on other blogs. One participant described how the majority of her contributions were made as responses to other posts: *"I have no idea how scattered I am across this MOOC, I have no idea how many contributions I've made, 30? 50? I've got a lot of replies"* (Participant 5). This participant went on to describe how she sought to encourage interaction: *"So I usually end a reply on an open end. That's one of my, you know, I structure it that way"* (Participant 5).

Aside from writing and commenting on blogs and following Twitter, active participants with primarily internal networks described other spaces that were particularly conducive to connection and collaboration. These spaces, established by the participants rather than facilitators, became the most vibrant community spaces for the course. One such space was Facebook, as described by one participant: *"I found the Facebook group was where I really engaged with the course and teamed up with a few people there and it was good"* (Participant 8). The same participant highlighted the value of some particularly active participants who could be inspirational to the rest of the cohort: *"Oh there's some people who are everywhere you turn in the Change11 MOOC: there's this group of people who are inspirational, just phenomenal the way they just keep going and they know their way around it"* (Participant 8).

While the majority (nine of 12) of active participants appeared to segregate their internal and external networks (effectively treating the Change11 as a closed course) a small number of participants (three of 12) seemed to have merged these networks to some extent – recognizing the artificiality of trying to separate different networks. One participant described how she actively sought to bring the two networks together when it was appropriate to do so:

"I try to think about taking what I find relevant in the [MOOC] and specifically advocating for it within [my external network] as well. So I do cross-pollinate like that. ... I hope that's helpful to people who normally wouldn't see this kind of stuff." (Participant 25)

The same participant summed up the value of being active in the course as follows, referring both to her motivation and to the development of her digital skills:

"I've gone further with the tools than I had in the past, so getting really familiar with Twitter, with Facebook, with LinkedIn, with Diigo for social bookmarking, for blogging, for

setting up a blog ... and I remember when I crossed the threshold of having 1000 views ... yeahhh! It felt good to see the attraction, to have my work referred elsewhere." (Participant 25)

While a connectivist MOOC should cater to all types of participants, active participants represent the ideal learners for this type of course design: not just consuming content, but connecting with others, creating new content, and contributing these new resources back into the course for others to utilize. In fact, without a critical mass of active participants, a connectivist course would fail.

- **Lurkers.** The largest category of engagement identified in this analysis was of *lurkers* (13 of 29). These participants were actively following the course but did not *actively* engage with other learners within it. These participants were by no means disengaged with the course, or unhappy with their position. Instead, lurking was an active choice for them. One participant offered the view that *"lurking is actually hugely beneficial"* (Participant 18), before going on to describe how the course content was effectively new knowledge filtered by the course organizers and therefore had *"more value than something I randomly come across on the Internet"* (Participant 18).

As before, different types of lurking behavior were seen, based on the networks (external or internal) these lurkers engaged with. We saw three subcategories: (1) those who felt they did not engage with any network at all (four of 13); (2) those who engaged with networks external to the Change11 course but not with the internal networks (four of 13); and finally, (3) those who silently participated in internal networks (five of 13). Four of the participants did not engage with any network at all, and had a simple explanation for their behavior: that they were not interested in engaging with others to learn. One explained: *"I guess I tend to be a loner and I've done more lurking and I'm quite happy lurking, I think it's an honourable profession"* (Participant 21), while another simply stated: *"I have not created any links with people, I have not said who I am and what I'm doing"* (Participant 15). Even though this group had not engaged with others, the fact that they were still following the course after almost five months shows that the course format is compatible with their needs.

Four participants maintained a complex position whereby they were inactive within the course, but actively shared ideas from the course externally. As one participant reported:

"I'm going out to the MOOC and lurking and getting lots of great interesting ideas and I'm bringing these back to some of my home based networks, both ones within my institution but also ones within my network that I've built up professionally." (Participant 1)

A second participant made a similar point:

"I'm more or less like what do you call? A lurker and not very active ... I'm always invisible and the reason is that the way I've been using the MOOC is to put into things that I'm doing. Like I said, to be a network mentor." (Participant 17)

Both these participants had a clear understanding of why they wanted to participate in Change11. They wanted to apply the new knowledge they had gained to improve their own practice. Similarly, a third lurker in this group had shared her experience in the Change11 MOOC with colleagues at her own institution, while showing little engagement with the course community.

Finally, a group of five participants (all of whom self-identified as lurkers) silently participated in internal networks but did not contribute to the course in any way. Their behavior appears to be motivated by lack of confidence. For example, one participant provided the following explanation for her lurking:

"No, because I basically, I got caught up in my own learning and I didn't feel ... [it was worthwhile to contribute my] limited knowledge about what was being discussed. Beyond saying 'oh that resonates with me' well how many times have MOOC'ers said that! And I know it does resonate, but beyond that I couldn't add anything new." (Participant 18)

Others saw silent participation as a step to more full participation in future courses, acknowledging that in this course, they did not quite have the confidence to participate actively. As one participant remarked: *"I did write a blog post but I conveniently wrote it somewhere no one would read [it] and I wrote it in [not English], so more like cathartic to me, rather than me*

putting it out in the open" (Participant 4). These silent lurkers saw a connection between level of participation and their success as learners, as exemplified by this quote from one participant: *"I would have felt I accomplished more if I had personally networked and participated more"* (Participant 33).

The lurkers category is somewhat complex as it includes a spectrum of participants from those who lacked the confidence to participate, to those who were so confident they didn't need to participate in the course in what they might regard as "the traditional manner." What links all these lurkers is that a cMOOC format works for them – they have the skills to leverage what they want from the course, on their terms.

- **Passive participants.** The final group identified was the *passive participant* group. This category of four participants was united by their apparent frustration or dissatisfaction with the course. For one participant, the connectivist nature of the course just did not seem appropriate, as this extensive quote illustrates:

"I wrangled with the whole issue of connectivism, not the concept so much, as my ability to do that, to connect with others, and so I think I was looking inward a little bit and had some difficulty there as to whether or not I could succeed in that aspect as a learner, to be able to really make connections with other people on a deep level. I mean, sure, I can read other people's blogs and that's not a problem, and I comment occasionally, but as far as really putting my ideas out there in the open in my own blog to be trampled on, you know there's a bit of fear there I think that I have and so that has been difficult for me, to really put my ideas out there, which I know is good from the aspect of I could get feedback and learn from that, but there's still something in me that says what do I know? Who am I to contribute my thoughts to the world? I'm just this little person over here." (Participant 12)

Another member of this passive group failed to see the inherent value of learning through the network but instead seemed to be looking for a more formal course:

"I selected the MOOC because it was being led by a well-known, well established, very experienced names [sic] and that's actually the secret, I realize now that what I'm looking for when I'm looking to make a jump in development is actually more guidance rather than freeform learning. The whole point is I can do the freeform anywhere, anytime, 24 hours a day on the net." (Participant 23)

A third member expressed her frustration with not connecting: *"I'm not really sure how to find a group of people online who really want to learn about what I most want to learn about"* (Participant 13).

The invitation to participate in this study was sent out in Week 17 of the course. It is therefore surprising that these passive participants had persisted with the course to this point; perhaps they could be categorized as dissatisfied lurkers (in contrast to the satisfied lurkers identified above). Despite extensive efforts by the course organizers to accommodate learners of all types in the Change11 cMOOC, via videos and guidance in the orientation week of the course, it seems that the cMOOC format is not suitable for every learner. It is also important to acknowledge that it is likely that many course participants had dropped out by Week 17, and that it is this category of passive participants – whose needs are clearly not being met – who are most likely to have dropped out and are therefore underrepresented in this study.

Factors Affecting Engagement

Our second research question asked, "What principal factors mediate engagement?" From the accounts of engagement in the Change11 cMOOC that were collected, some key factors affecting engagement in this cMOOC can be identified:

- **Confidence.** One key factor evident in the responses of both passive participants and lurkers relates to their confidence levels. Here, for example, a participant describes how her lack of confidence discouraged her from sharing her bookmarks socially:

"I actually did sign up with Diigo thinking right, this is it, I'm going to throw myself in. But once I was in the MOOC and running the idea, I actually felt almost as though I would be,

instead of sharing with others, I was going to be simply showing my ignorance, even in terms of what I was selecting and why I was selecting it." (Participant 23)

Elsewhere, numerous participants described writing blog posts but not publishing them – in this way they gained the benefit of working through ideas, without having to expose those ideas to a potentially critical audience.

- **Prior experience.** An important factor was participants' *prior experience*. Twenty of 29 participants had previously participated in a cMOOC. As shown in Table 2, all but one of the active participants had previously participated in another cMOOC, while none of the four passive participants had previously participated in a cMOOC. Learning in a cMOOC is fundamentally different from learning in a formal course, and requires some adjustment.

Table 2. Participant group by previous cMOOC experience

		Participation in Previous cMOOCs		
		Yes	No	Total
Level of Engagement	Active Participant	11	1	12
	Lurker	9	4	13
	Passive Participant	0	4	4
	Total	20	9	29

- **Motivation.** Finally, motivation was identified as an important determinant of engagement. Several of the active participants described a clear aim associated with their participation in the Change11 cMOOC. For example, this participant had clear ambitions to change his/her practice: *"The ultimate aim of participating in this MOOC is to see how I can completely change the way that I teach and illustrate through example how others could do the same"* (Participant 32). In contrast, passive participants had less well formed aims, as illustrated by this quote:

"Maybe that's part of my problem that I didn't maybe have a strong enough particular aim, like I'm interested in the idea of understanding better how they work, but I'm actually more interested in learning about other things that are nothing to do with online learning." (Participant 23)

Discussion and Conclusion

Active participants represent the key group in a cMOOC. A successful course becomes the content that these participants create and share, far more so than the live presentations and course readings. Moreover, the network of connections with other learners is something that can persist long after a cMOOC has ended. The more active or experienced members of the group provide a model for those who are less experienced, and are instrumental in creating the emergent spaces supporting connectedness and interactivity (Downes, 2009), which Kop et al. (2011) have argued are essential to successful connectivist learning environments. One key observation from this study is that all but one of the active participants had previously participated in at least one other cMOOC, while none of the four passive participants had participated in a cMOOC. It seems clear that learners must learn how to learn in a cMOOC.

In contrast to active participants, lurkers can potentially gain all the benefits of the course, but apparently contribute nothing in return. Discussing lurking in traditional online courses, Rovai (2000) describes lurkers as "learners who are bystanders to course discussions, lack commitment to the community, and receive benefits without giving anything back" (p. 291). This negative perception of lurkers was shared by some active participants who felt that being a lurker was incompatible with the concept of a cMOOC course, reliant as it is on participation and the activities of aggregation, relation, creation, and sharing identified by Kop (2011). However, cMOOCs must accommodate learners of all types to satisfy Downes' (2009) *diversity* and *openness* criteria. In practice, as long as there is a balance of these different types of learners, then lurkers can be accommodated, and the evidence from this study is that lurkers can learn effectively in connectivist environments: taking the knowledge they acquire to their own external networks.

In this study, the distinction between lurkers and passive participants reflects the observation that lurkers (most, but not all of whom self-identified as lurkers) were content with their participation in the cMOOC. In

contrast, passive participants seemed frustrated with the course and their behavior indicates that they did not want the autonomy to choose where, when, how, and with whom to learn (Downes, 2009). Learner confidence was also a factor in this group, with some participants indicating that they felt they did not have anything useful to say. Others seemed to be lacking the critical literacies to learn effectively in a connectivist course.

The findings presented here are part of a larger study examining self-regulation of learning in cMOOCs. While the whole study contributes a substantial body of new empirical data about the learning experience afforded by cMOOCs, there are some limitations that must be acknowledged and considered. First, the sampling strategy used (recruitment via a call for participation included in the e-mail newsletter in Week 17 of the course) would not have reached participants who had already dropped out by this stage. Second, the authors noted that participants in this cMOOC were as interested in the cMOOC process, as in the Change11 content, and therefore it may be difficult to generalize the findings of this study to other courses. Careful design of future studies could avoid these limitations. Future studies should seek to compare the learning experience offered by different cMOOCs, target specific types of learners, and could attempt to follow learners across different cMOOCs to gain a better understanding of how critical literacies for learning in cMOOCs develop.

Understanding the nature of learners and their engagement is critical to the success of any online education provision, especially those where there is an expectation that the learner should self-motivate and self-direct their learning. Massive courses, by their very nature, bring in learners with a range of backgrounds, previous experience, and skill levels, and it is therefore incumbent on course organizers to design a learning experience that accommodates these diverse learner profiles. The three factors affecting engagement identified in this study (prior cMOOC experience, confidence, and motivation) provide an insight into how organizers of future cMOOCs might address this design challenge. Those participants who have not previously studied on connectivist courses can easily be identified. These participants may be given additional induction, or could be paired with a more experienced student who could act as a mentor. An approach like this would have helped Participant 13, who felt unable to find similar learners in the course. Those participants who lacked confidence could be paired with learners of similar experience to act as "buddies." Finally, learners could be encouraged to identify and articulate clear aims and goals for the course to increase motivation (Locke & Latham, 2002). Goals could also be used as a social object through which learners could find others with similar interests and aspirations (Milligan, Margaryan, & Littlejohn, 2012).

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Acknowledgments

The authors would like to thank all those participants who gave their time for this study. They would also like to thank Lou McGill for conducting the interviews and Susan Houston for transcribing the audio of those interviews.



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