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Down the Rabbit Hole: An initial typology of issues around the development of MOOCs

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DOWN THE RABBIT HOLE: AN INITIAL TYPOLOGY OF ISSUES AROUND THE DEVELOPMENT OF MOOCS

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INTRODUCTION

From the end of 2011 to the beginning of 2014, the MOOC (Massive Open Online Course) has been the most prominent phenomenon, and major trend, in online pedagogy and educational technology. MOOCs have gained so much attention that the media characterized 2012 as the year of the MOOC (Pappano, 2012). The roots of the MOOC can be traced back to a variety of technological advancements and philosophical stances including: Free and Open Software, OpenCourseWare, Open Educational Resources, and the collaborative principles of "Web 2.0." Thus, development of MOOCs is ambitious and goes beyond the simple offering of free online text-based course materials. MOOCs have been described as harnessing the power of cloud computing and social networks, thereby offering a digital learning ecosystem within which experts who seek to facilitate learning and millions of people interested in learning come together to realize the vision of open education for all (Liyanagunawardena et al., 2013). A number of universities have been actively involved in the formation of several consortia that offer MOOC services. Demographic information and fast growing numbers of participants reveal a great enthusiasm about the MOOC phenomenon. MOOCs, while beginning in the North American context, have become a global phenomenon with courses being offered in many languages, in many continents[1]. However, it should be noted that despite all the initial optimism, many now contest original stances regarding the potential for MOOCs to make education available to all.

Even though MOOCs have been heralded as Disruptive Innovations (Horn & Christiansen, 2013), and despite the excitement by a select group of pundits, universities, professors, and learners who have jumped into MOOCs, theorists have raised several questions regarding the effectiveness and sustainability of

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[1] A good, albeit incomplete, list of MOOC providers globally can be found on http://www.class-central.com where one may find a partial, but impressive, catalog of courses offered through the MOOC format.

MOOCs. In the two years since MOOCs were catapulted into the limelight, a variety of problems and limitations have emerged. These limitations and problems manifest themselves in technological, design, human resources, and logistical concerns and are connected with the MOOCs themselves and with the environments in which MOOCs are situated. In addition there is currently a scarcity of academic research on MOOCs and most of the relevant work remains anecdotal, written either from participants' personal experiences, or by educational pundits who observe without participating. To this end, this chapter reports the main findings of the extant literature regarding the proliferation of MOOCs, focusing on problems and areas for potential improvement that remain to be resolved and researched. We have surveyed the limited-to-date research on MOOCs, as well as influential blog posts from MOOC thought leaders, and news posts from Higher Education news outlets covering this MOOC phenomenon. With these in mind we will provide categories of issues and challenges for MOOC design, implementation, and learning.

METHODOLOGY

This study is largely based on desk research that authors have conducted over the last two years. In this section we describe the basic data collection method and materials and then we proceed with the data analysis procedure. In the latter we were guided by the lens of Grounded Theory which we present in the subsequent section.

DATA COLLECTION

As researchers, we collected the materials that we analyzed over a two year period between November of 2011 and February of 2014. We collected writings as they appeared on the Internet and archived each writing for future use. We collected sources from various Internet subscriptions and from academic press sources such as the *Chronicle of Higher Education*, open access academic journals such as the *Journal of Online Learning and Teaching*, from the accounts of participants in MOOCs, and from influential thinkers and bloggers on the field of MOOCs. As part of this effort we also crowd-sourced our collection by following influential individuals in the fields of MOOCs and Open Education, and we collected sources that these individuals shared on twitter with their followers. These influential thinkers and bloggers are individuals who have been working and writing about the field of education, open education, and MOOCs prior to the 2012 MOOC-hype. We think of these individuals as public academics who share their emerging views, know-how, and their acts of public teaching though open channels of communication. In line with our open ethos we've collected, and analyzed academic articles and conference proceedings from open access sources. In our opinion, it is antithetical to the MOOC to study and publish about open education in journals that are subscription-based, or within journals where self-archiving is not allowed, such that one cannot find legal copies of articles through open search engines such as google scholar.

The authors collected, saved, categorized and evaluated sources for their

content's value in this project. In total, between November 2011 and February 2014, we collected 161 sources. Of the collected resources we deemed 109 useful and appropriate for this research and rejected 50 items in our original collection. Sources we disqualified as not appropriate included blog posts that, upon closer examination, we determined linked only to narratives within the original sources but did not provide additional insight, and news stories that were merely press-announcements with no additional depth or information. Our 109 sources breakdown as follows:

Type	Count	%	Source
Books	3	2.7%	Clark & Mayer, 2003; de Waard, 2014; Veletsianos, 2013
Academic Journal Articles	20	18.3%	Ahn et al, 2013; Balfour, 2013; Bruff et al, 2013; de Waard et al, 2011; Fini, 2009; Kop, 2011; Kop et al, 2011; Kop & Carroll, 2012; Koutropoulos et al, 2012; Koutropoulos et al, 2014; Liyanagunawardena et al, 2012; Lombardi, 2013; Marshall, 2013; Milligan et al, 2013; Rodriguez, 2011; Rodriguez, 2012; Schmidt et al, 2009; Stephens, 2013; Waite et al, 2013; Williams et al, 2011;
Conference Presentations and/or Proceedings	11	10%	Bremer, 2012; Cabiria, 2012; Cator et al, 2012; Creed-Dikeogu & Clark, 2013; de Waard et al, 2011; Hara et al, 2013; Koutropoulos et al, 2013 Koutropoulos, 2014; Mak et al, 2010; Mackness et al, 2010; Whitelock et al, 2013;
Videos	5	4.5%	Agarwal, 2013; Cormier, 2010; Koller, 2012; Shirky, 2008
Blog posts from Researchers and those involved in MOOCs	22	20.1%	Baxi, 2012; Clark, 2013; de Zwart, 2012; Downes, 2013; Haywood, 2012; Hogue, 2013; Hawksey, 2012; Koutropoulos, 2012; Lane, 2012; Levine, 2012; Lockhart, 2012; Mackness, 2012a/b; Mackness, 2013a/b; Morrison, 2013; Shirky, 2012; Siemens, 2010; "MOOC honeymoon is over", 2013; Vollmer, 2012; Watters, 2012; Weller, 2013a/b/c;
Newspapers, News Media, and Trade Publications	36	33%	Abernathy, 2013; Airbach, 2013; Azevedo, 2013; Baron, 2012; Betts, 2013; Byerly, 2012; Chafkin, 2013, Counihan, 2013; Educause, 2012; Girelli, 2013; Horn &

			Christiansen, 2013; Haber, 2013; Jaschik, 2013; Kim, 2012; Koller et al, 2013; Kolowich, 2013a/b/c/d/e; Kolowich, 2014; Korfhage, 2013; Kim, 2013; Koutropoulos, 2013a/b; Mazoue, 2013; Markoff, 2013; Pappano, 2012; Selingo, 2012; Straumsheim, 2013; "What Modularity Means for MOOCs", 2013; Waldrop, 2013; Waters, 2013; Wilkowski, 2014, Winston, 2013; Young, 2013; Youngman, 2013
Other Sources (websites, images, reports, etc.)	12	11%	"About UDL", n.d.; Christiansen et al, 2013; Conole, 2013; Edwards, 2012; Knox et al, 2012; Landry, 2013; McAuley et al, 2010; Neachtain, 2013; Plourde, 2013; Roberts, 2013; Scagnoli, n.d.; Schroeder, 2011;

Table 1: An organization of the sources used by type

DATA ANALYSIS PROCEDURE

We conducted our analysis through the lens of Grounded Theory. We read through the collected literature and noted the various codes that were emerging from the texts. In the case of research articles and conference proceedings, codes were also accompanied by findings of the research, and ideas for future research. In the case of blogs and news items we also noted commentary and open queries by the authors. We arranged these codes according to concepts, and the categories we are proposing emerged from a the assimilation of similar concepts into overarching categories. The following table shows the categories, as well as which source materials fall within each category.

Challenges + Issues	References
Multiple Meanings of an Acronym	Cormier, 2010; Educause, 2012; Neachtain, 2013; Plourde, 2013; Stewart, 2013; Baron, 2012; Koutropoulos, 2012; Downes, 2013; Landry, 2013; Byerly, 2012; Waters 2013; Kim, 2012; Veletsianos, 2013
Academic Governance and Goals of the MOOC	Azevedo, 2012; Selingo, 2012; Mazoule, 2013; Straumsheim, 2013; Marshall, 2013; Counihan, 2013; Kolowich, 2014
Instructional Design	Schroeder, 2011; de Waard, 2014; Airbach, 2013; Lane, 2012; Clark, 2013; Conole, 2013; Hogue, 2013; de Zwart,

	2013; Waters, 2013; MacAuley et al, 2010; Kop 2011; Knox et al, 2012; Weller, 2013b
Learner Motivation	Abernathy, 2013; Veletsianos, 2013; Lombardi, 2013; Bremer, 2012; Roberts, 2012; Koller et al, 2013
Learner Engagement and Participation	Koutropoulos et al., 2012; McAuley et al., 2010; Rodriguez, 2011; Veletsianos, 2013; Kim, 2012; Cabiria, 2012; Fini, 2009; Kop, 2011; Kolowich, 2013a
Learner Satisfaction	Kop, 2011; Veletsianos, 2013; Kop & Carroll, 2012
Usability and Accessibility	Veletsianos, 2013; Girelli, 2013; Koller, 2012; Agarwal 2013; Edwards, 2012; Roberts, 2012; Fini, 2009; Kop et al, 2011
Assessment Challenges	Abernathy, 2013; Attali, 2007; Balfour, 2013; Veletsianos, 2013
Value of Completion & Certification	Bremer, 2012; Kolowich, 2013d; Veletsianos, 2013; Lombardi, 2013; Bett, 2013
Sustainability & Reputation	Haywood, 2012; Cator et al., 2012; Stewart, 2013; Koutropoulos et al, 2013; Girelli, 2013; Hara et al, 2013; Kolowich, 2013c; Betts, 2013; Weller, 2013; Fini, 2009; Mackness et al, 2010; Roberts, 2012; Veletsianos, 2013; Jashcik, 2013
Course Content and Copyright	Koutropoulos et al, 2013; Veletsianos, 2013; Kolowich, 2013b; Wiley, 2013b; Vollmer, 2012
Teaching	Rodriguez, 2011; Kolowich, 2013b; Kop et al, 2011; Stewart, 2013; Roberts, 2012; Kop et al, 2011
Cultural Communication, and Cultural Hegemony	Koller, 2012; Agarwal, 2013; Chafkin, 2013; Shirky, 2012; Airbach, 2013; Koutropoulos, 2014; Kop, 2011; Cabiria, 2012; Girelli, 2013

Table 2: Initial typology and supporting sources

RESULTS

A CLASSIFICATION OF MAIN PROBLEMS AND CHALLENGES

Based on the literature that we've analyzed we've identified fifteen (15) broad areas of interest expressed by those discussing potential issues and challenges surrounding MOOCs. The issues/challenges should be considered when designing, implementing, and deploying MOOCs. It bears noting that even though we regard each area of interest as distinct, we acknowledge areas do interconnect, influence, and enhance each other's effects. These areas span the spectrum of the MOOC lifecycle, from conception and development to implementation, evaluation, and the ultimate re-offering of the MOOC.

MULTIPLE MEANINGS OF AN ACRONYM

One of the biggest issues around the MOOC is its own problematic definition. While the original definition offered by Cormier (2010) points to a succinct denotation, this original definition defines only what is now known as a cMOOC[2]. More recent, and liberal, definitions have emerged to describe a MOOC. This has resulted in terming as 'MOOC providers' entities such as Udemy (Educause, 2012) and ALISON (Neachtain, 2013), and subsequently this fluidity in definition has given rise to jokes such as "MOOC: Every letter is negotiable" (Plourde, 2013). Because of this "negotiability" the meaning of the term, MOOC, has become vague and contested (Stewart, 2013).

One of the early issues that we see is brought forth by Baron (2012) who was pondering if MOOC platforms, such as Coursera, actually host MOOCs since everything hosted is hidden behind a sign-up wall, the material is copyrighted and closed, and these MOOCs don't subscribe to the original ideals of MOOCs, as defined by Cormier (2010). Cormier posited MOOCs as environments wherein learners aggregate materials, repurpose, remix, and feed-forward into the MOOC ecosystem.

Another issue with definitions comes from the contested definition of *"massive"*. The xMOOC seems to center around the massive scale at which these platforms can enroll students. However, we, and others, argue that that massiveness is relative (Koutropoulos, 2012). Stephen Downes, one of the founding thinkers in MOOCs, for instance, indicates that his cut-off point is 150 (Dunbar's number) because 150 is the theoretical maximum number of people that a person can interact with (Downes, 2013).

Other issues relate to the amount of allowable enrollments. Landry (2013) points out that there have been MOOCs that have limited enrollment to 500 participants. While, from what we see in the literature, the number of participants can be variable in MOOCs, does the fact that a course *explicitly* state an upper limit to enrollment runs counter to the *Open* ethos? Take for example the *CopyrightX* MOOC. The description of this MOOC, offered through Harvard Law and only accepted limited enrollments, sounds a lot like they were creating a large section online course by pairing smaller groups of students with a tutor. The pedagogy wasn't really that different from a large lecture section

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[2] For more discussion and definitions of cMOOC and xMOOC, as well as their historical backgrounds please read other articles in this volume.

course, with smaller discussion breakouts. The question then becomes, if a course has an application process, and limits the number of students, is it really *open*?

We must also ask what it means to be a student in a MOOC environment. Byerly (2012) describes a Coursera course as having 11,500 students. It is interesting to consider just *who* is counted as a student in a MOOC and what terms, such as *enrollment,* actually mean. We have to ask ourselves whether or not there is some shift occurring these days as to how we define the word "student" within the context of a MOOC. Would the shifting definition of "student" be operating under the same system that has controlled the way the term "friend" has shifted meaning on the Facebook social networking platform? Relating to how we define student, the way we account for enrollments also impacts how we think of "dropouts" in the MOOC environment.

A final issue regarding definitions associated with MOOCs revolves around the mushrooming of acronyms created over the past couple of years, a result of the way people working in their own silos don't realize what has come before them, or what is currently happening in the field. Waters (2013) talks about several types of MOOC offshoots, including a DOCC (Distributed Open Collaborative Course) which really sounds like a recast of cMOOCs, the original MOOC type which originated in 2008. There is a problem with clarity when people start making acronyms that don't really give practitioners any idea of the functional parameters of the design. On the flip side, MOOCs are also confused, and conflated, with traditional online learning (Kim, 2012) which, as Veletsianos puts it, constitutes "an oversimplification [that] prevents educators, designers, developers, and researchers from seeing what is unique in each context, and impedes stakeholders from improving learning environments and platforms" (2013 p.3). In sum, the acronym MOOC is one signifier with many signified meanings. This makes it hard to communicate accurately about this new form of online learning as it may mean different things to different people.

ACADEMIC GOVERNANCE AND GOALS OF THE MOOC
One of the issues arising over the last few years involves the way MOOC hosting has moved from social and distributed platforms to platforms that require institutional buy-in, vis-à-vis an agreement among institutional stakeholders to support a major institutional MOOC platform. This process is similar to the buy-ins one might see with the implementation of a Learning Management System such as Moodle. These buy-ins happen at the higher levels of the institution, and, as such, often exclude faculty from influential positions when it comes to the decision to offer xMOOCs (e.g. Azevedo, 2012). This is quite an interesting turn of events because initial cMOOCs involved faculty members working on their own to offer open, online versions of their courses, thus enabling engagement of learners outside University's walls.

MOOCs are currently presented as a *fait-accompli* by both their supporters and the critics, but they are far from it. MOOCs are here to stay, they will disrupt education, and what is considered a MOOC looks and acts in a specific way. This rhetoric of absoluteness creates divides, and camps of supporters and non-supporters, in academia. In this context, when faculty members become disintermediated from the educational process, there will be unforeseen consequences resulting from the failure to engage major stakeholders. Since MOOCs are not yet a format that has firm definitions, including

definitions about governance, questions arise, such as: What are the pedagogical ramifications of a University offering courses that are not embraced, or not endorsed, by the University's faculty? What are the potential pitfalls for the University's reputation? How sustainable are courses that don't have this endorsement from the faculty and therefore potentially may not be receiving proper attention? Is this money down the drain for institutions or is there a hidden benefit?

Related to course quality, we see that there is a question of the value of each individual MOOC (Selingo, 2012). When compared to traditional courses, either online or in-person, a MOOC raises questions about the value of the academic credit. What is it about a course that warrants one, two, three, or four academic credits? And, in cases in which a MOOC participant logs and verifies having met those same requirements, would and/or should a MOOC be considered equivalent to a traditional course as far as credits and degree requirements are concerned? At an institutional and governance level these types of discussions will need to lead to some clear answers in order to assign the *value* of a MOOC to MOOC participants.

There are those who claim that the turning point for MOOCs will occur when there are MOOC-based degree programs (Mazoule, 2013), and thus it may be inferred that the value of MOOCs will be evident at that point in time. In light of a recent experiment in MOOC-based degree programs, offered through Georgia Tech on Udacity, (Straumsheim, 2013), it would make sense to keep in mind questions raised by Marshall. Are MOOCs a risk for substitution for institutional offerings? How is the value of the institutional educational offerings differentiated from substitutes such as MOOCs? What are the fundamental qualities of the institution's educational offerings that differentiate the institution? What is the institution's strategy for recognition of student learning undertaken in different contexts, such as those of non-traditional classroom environments? (Marshall, 2013). In the end, are MOOCs another product for the University? Are they a competitive threat? Or are they a way to get new students interested in the University's offerings (Counihan, 2013) and to coax Alumni to donate (Kolowich, 2014)? These and many other questions arise when we begin thinking of MOOCs as potential competitors to the status quo.

While MOOCs began as individual experimentations in distributed pedagogy, to some extent, institutions themselves have grown to embrace MOOCS. This institutionalization of the MOOC does pose many questions about how this model fits into the traditional fabric of academia. Those questions have yet to be answered.

INSTRUCTIONAL DESIGN

Instructional design is at the core of the production process behind many courses offered online these days. Schroeder (2011), Scagnoli (n.d.), and de Waard (2014) are among those who have proposed design considerations for MOOCs as well. Even though instructional design and educational practices vary from country to country, and from culture to culture, the instructional design and pedagogy of MOOCs is spearheaded, or some might say dictated, by the Western Academe (Airbach, 2013).

Instructional design issues are closely related to issues in defining the characteristics of MOOCs. We see this theme presented in posts such as those of Lane (2012), Clark (2013), Conole (2013), Hogue (2013), and Bonk (de Zwart, 2013), each of

whom tries to categorize the varieties of MOOCs through various means. Being better able to describe what we are talking about allows us to better engage in that topic. Some MOOC proposals attempt to create something new and novel without understanding the background and history of distance education and institutional knowledge of what does, and does not, work (Waters, 2013).

In MOOC environments traditional scaffolds are removed, therefore the participants are left to deal with more confusion and uncertainty (McAuley et al, 2010). Thus, learners in MOOCs should not be complete novices at learning if they endeavor to be successful, and in cMOOCs, in specific, learners should be able to contribute to the community. Kop (2011) identifies three challenges to Connectivist learning environments, such as cMOOCs, these include critical literacy on the part of learners, learner autonomy, and level of presence. This triad of challenges needs to be kept in mind when designing new MOOCs, and the challenges involved connect with expected learner backgrounds and previous knowledge and behaviors.

Further, when thinking about design, it is important not to be constrained by the platform you have chosen. Knox et al (2012) discuss digital mimicry. Even though their MOOC ran on the Coursera platform, this team decided to structure their MOOC in a fashion far different from most offered on that hosting service. For MOOCs to fulfill their promised role as vehicles for educational innovation, MOOC designers need to move past mere mimicry of what is already present on the platform, to experiment and find new best practices.

Finally, it is an important design consideration to think about the appropriate length of the MOOC. From what is reported in Weller (2013b) it would appear that shorter courses do better, from the point of view of retention of learners when compared to MOOCS which mimic longer, more traditional courses. While it is hard to compare attrition rates between shorter and longer courses, it is important to avoid basing the MOOC's duration, blindly, on the length of the 'same' course offered on campus. The design considerations are different, and thus appropriate length may vary.

LEARNER MOTIVATION

Even though MOOC course videos may sometimes be produced in a familiar manner, making the learners feel like the instructors are speaking to them and not an empty room, this does not motivate learners enough to continue to participate in the course (Abernathy, 2013). Sometimes learners are motivated to learn through a MOOC because of their personal interest or because they feel that the content of the MOOC is quite novel (Veletsianos, 2013). In our examination of source material, we found that most students who wrote about their MOOC experiences came from fields and backgrounds outside the topic areas of the MOOC in which they participated. These students were curious to learn new things outside of their areas of study (Veletsianos, 2013).

Another factor motivating MOOC participation stems from learners feeling free to enter the course at a time that is appropriate for them, thus they experience some choice in participation. For instance, in Veletsianos (2013), a learner reports: "A unique aspect of my MOOC experience is the fact that I enrolled in and started this course during its fourth week. At the end of the course, I went back to the modules I missed and completed those on my own." MOOCs that have no specific deadlines and that follow a

self-paced learning mode tend to induce lower stress in students, an additional motivating factor (Veletsianos, 2013, p11). It is important to note that many learners, in fact, two thirds of the learners discussed in Lombardi (2013), joined the MOOC for fun, enjoyment and educational enrichment and did not identify career goals as a primary motive.

New trends such as gamification practices also have been identified as a motivating factor in continuing MOOC participation (Veletsianos, 2013). Last but not least, the cost issue is an important motivating factor that helps learners focus and persist on their studies in MOOCs. Coursera's Signature Track program provides a case in point. Some initial data indicate that Coursera MOOC learners in the signature track program are more likely to complete the course than non-signature track participants (Koller, Ng, Do, Chen, 2013). This phenomenon is quite reasonable because learners tend to be more motivated and engaged when they pay to participate and seek return on their financial investment. The potential pitfall of this two track system is that learners pursing study on the un-paid track might feel the course was meant for the paying track and not for them, a situation aptly described in Roberts (2012).

To sum up we note that, as has occured in other cases of e-learning technologies, MOOCs are more effective for students who are intrinsically motivated and can organize themselves well (Bremer, 2012).

LEARNER ENGAGEMENT AND PARTICIPATION

Learning engagement and participation may present the most crucial challenges for the current state of MOOCs as engagement and participation are associated with low levels of retention (Koutropoulos et al., 2012; McAuley et al., 2010), high dropout rates and a large percentage of learners who exhibit the behaviors of lurkers[3]. As Rodriguez (2011) puts it: "Dropout rate and behaviour of lurkers represents one of the most puzzling issues for most educators in online courses."

It seems that most MOOC success stories describe extraordinary individuals who overcome insurmountable struggles to flourish in MOOCs. These stories can be presented as best practice narratives and may provide models for others. Nevertheless this represents only one side of the MOOC phenomenon. Conversely, numerous learners have struggled with and abandoned MOOCs whereas these stories are rarely shared and remain largely untold (Veletsianos, 2013 p. 4).

Related problems are associated with the instructivist model wherein content is delivered in the form of "talking head videos." This model involves low interactivity on behalf of learners and as a consequence cannot be considered engaging (Veletsianos, 2013, p12). Moreover this instructivist, low interactivity model, is criticized for failing to foster the development of relationships and personal connections among learners and teachers and thus the model cannot provide authentic and meaningful learning experiences (Kim, 2012). This engagement problem sometimes is exacerbated by the fact that MOOCs often exhibit characteristics of poor design and low usability. For example, poorly organized discussion forums can be overwhelming (Cabiria, 2012) and very difficult to navigate. Issues of familiarity with ICT and English language are also

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[3] The term lurker is often used pejoratively to describe members of an online community who observe interactions within the community but do not actively participate in it.

considered to pose accessibility barriers (Fini, 2009; Kop, 2011), a factor that plays an important role in who does and who does not become engaged online.

On the other hand it is important to note that some have recently started to promote that the success of MOOCs can be based on criteria other than completion rates and/or levels of participation among all who have registered for the course (Kolowich, 2013a). According to the founders of Coursera, it is quite characteristic that "most students who register for a MOOC have no intention of completing the course. Their intent is to explore, find out something about the content, and move on to something else" (Kolowich, 2013a). To this end there is a belief that the vast majority of the learners populating most MOOCs act mostly as curious onlookers rather than as serious learners.

LEARNER SATISFACTION

Learner satisfaction is strongly affected by the learners' expected and actual behavior while participating in a MOOC. Veletsianos reports that xMOOC experiences appear to lack flexibility (2013, p12) and suggests that better moderation is needed in discussion forums, especially with regard to negative, rude, or overly sarcastic content and responses. Kop et al. report a case in which MOOC learners were "concerned about some anonymous contributions and incidents relating to personal criticisms of facilitators and participants" (2011, p. 88). This phenomenon is quite important since rude communications not only influence satisfaction but also forefront cultural and gender differences regarding perceptions of acceptable power relations within the MOOC community.

Some theorists assert that, as new learning environments, MOOCs are demanding and require a certain level of creativity and innovative thinking on the part of learners (Kop, 2011). Learners require creativity and innovation in order to be active in their learning processes, to edit and produce information and learning content in a variety of formats, and to learn in a collaborative way. However, these are quite hard things to accomplish. It appears as if many MOOC learners have been educated in a traditional model that makes them passive consumers of information. It is quite important to note that most of the learners who have sought flexibility in MOOC learning have been graduate students who had the background required to be successful lifelong learners (Veletsianos, 2013). Moreover, previous research has shown that it takes time for learners to build confidence and to act in more collaborative and creative ways (Kop & Carroll, 2012).

As we have already emphasized, it is important to investigate behaviors and learners' activities in forums so as to understand learner motivations, attitudes, and goals. It seems that the large number of lurkers access resources and attend the video lectures but they are not engaged in producing discussion posts, videos, or other digital artifacts. They feel more confident and more satisfied if they perform like consumers, rather than as creative producers within the course. Relevant findings from the study of Kop & Carroll (2012) reveal perceptions of lurkers in MOOCs:

- 54.5% of respondents indicated that they have always been self-directed learners and do not feel they have to actively share and reply to discussion forums and blogs to learn.

- 50.9% stated that they are tactical lurkers and they use particular strategies that are especially useful in their learning. For instance 34.3% identified two important behaviors that shape their learning strategy; being a listener and reflector, and thus *not* being an active participant, both of which they perceived to be natural things to do.
- 29.9% of them argued that lurking is a legitimate learning strategy
- 80.6% reported that issues such as time, job, family and other commitments outside their courses restricted their active participation.

In short, retention and level of participation in a MOOC are not the only measures of learner satisfaction, and actually may not be valid measures of learner satisfaction, at all. However, MOOC assessments levied within the reports we studied from this time period emphasized the low retention rates of MOOCs – often using the term "dropouts" - and frequently correlating, if not conflating, learner satisfaction with retention. In the era of the Open Online Course there are additional dimensions we need to consider, and measure, to gain an accurate sense of what learners expect when they sign up for a course; and it is through the use of these new measurements that we should determine if learners get what they expect out of MOOCs.

USABILITY AND ACCESSIBILITY

Although there are no usability studies reported in the extant literature of MOOCs it is a common belief that the current state of design of MOOCs has led to a plethora of usability and accessibility issues. For instance navigation through discussion forums is quite difficult because of the massive volume of discussion board posts (Veletsianos, 2013). It has been suggested that having forums close to the content could assist in overcoming some problems (Veletsianos, 2013). Although we see this proximity strategy implemented in platforms such as EdX and Udacity, there are no studies currently published that research this aspect of discussion forum placement on accessibility and on usability.

Another recommendation from students (Veletsianos, 2013) focuses on the desirability of captioning on videos and transcripts as a permanent feature of each lecture. Some learners believe it will help them to be able to read along when they watch lectures. On the other hand most of the MOOCs suffer from information overload and designers should find the right balance for designing only the necessary features without eliminating elements that could provide for better user experience.

Moreover the traditional lecture approach that most MOOCs follow poses several accessibility difficulties (Educause, 2012). Generally speaking, accessibility is a major issue that affects the prospect and growth of MOOCs. Several scholars (Girelli, 2013; Koller, 2012; Agarwal, 2013), have focused on the issue of how access can really be defined and how accessible MOOCs can be of service to people with disabilities and different learning preferences.

In the same collection of learner experiences in MOOCs (Veletsianos, 2013) it is reported that MOOC design generally does not cater to both novices and more advanced learners. Courses should identify explicitly the background requirements for the course, and should provide accurate and defined prerequisites. This could help overcome the

common problem of potential learners having insufficient background information about the MOOC, which can cause individuals who sign up for a MOOC to walk away with a sense that the course is not what they thought that they had signed up to take. Inattention to the details of prerequisite knowledge leads to misunderstandings and misrepresentations (Edwards, 2012).

Another related problem is that learners quite often get overwhelmed in MOOCs (Roberts, 2012). Learners do not want to deal with multiple interfaces. MOOC designers should ask relevant questions about how many places a learner can feasibly check-in on, daily, to keep up with a course. Should there be one central location for all course updates? Should information be distributed in a variety of online locations such as facebook, twitter, and the course LMS? Designers and usability practitioners face a lot of challenges as they traverse the MOOC landscape. As evident in the case of Pageflakes[4] (Fini, 2009) even a host service based on a rich and engaging graphical interface can be perceived as a "disorganised mess." Sometimes, however, cluttered work spaces seem necessary when learners are required to manage a vast array of resources effectively and must learn to distill relevant information from the "noisy" network (Kop et al, 2011).

Ultimately it is necessary to evaluate the several tools in a MOOC from a holistic perspective of user experience that extends traditional usability dimensions, that goes beyond instrumental and pragmatic qualities. As already stated there is a dearth of relevant research work in this area, although it will be fascinating to see findings from empirical user experience evaluation studies in environments hosting thousands of participants with diverse cultural and cognitive backgrounds.

ASSESSMENT CHALLENGES

In most cases MOOCs are designed to include a set of online multiple choice quizzes based upon content delivered through recorded lectures. Nevertheless such a strategy of assessment is neither the most suitable, nor the most effective and valid assessment of knowledge (Abernathy, 2013). Some have proposed techniques that will support a move beyond this type of assessment including Automatic Essay Scoring (AES) and Calibrated Peer Review (CPR). Both techniques come with limitations though. For example, AES simply doesn't do well with communications involving complex metaphors and humor (Attali, 2007 in Balfour, 2013). CPR is potentially difficult to scale to a course with massive enrollments because most essays are scored by only three peer reviewers (Balfour, 2013). In addition CPR proves more effective when learners are trained on the method (CPR), when there are more reviewers per paper, and when essays are short (750 words or less) and tightly focused with common sources. Moreover, scholars criticize the quality of feedback provided through CPR, and especially so in the case of xMOOCs (Veletsianos, 2013). In terms of what might work well in MOOCs, a number of students reported that they liked the ability to save work and come back later to complete weekly assignments that involve low stress and that pose no time limits (Veletsianos, 2013).

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[4] PageFlakes was a personal web-portal service that operated from around 2005 to 2012. With this service users could organize, among other things, RSS feeds. This was used as one example of users organizing their MOOC content.

VALUE OF COMPLETION & CERTIFICATION

At the completion of most xMOOCs, students who have met certain requirements, usually including completion of quizzes and/or exams, receive a certificate. Some platforms call it a certificate of "achievement," and others of "participation." Either way, the institutions offering these MOOCs are actually not able to provide students with a formal recognition of achievement since the learners are not formally affiliated with their institutions (Bremer, 2012). If colleges were to accept MOOCs that have been accredited by American Council on Education this could go a long way toward making these certificates more valuable to learners (Kolowich, 2013d).

Of course, even if institutions were to accept MOOC completion for credit, there are still outstanding issues that come up regarding the value of a certificate, and those issues tie into other categories in our taxonomy. Recall that Veletsianos (2013) provides one good example of students who were interested in following and completing a course solely to acquire knowledge of the subject matter. However, despite the fact that students who completed the course received a certificate, at least one learner had a feeling of "hollowness and incompleteness" (p.10), subsequent to course participation. Such extreme reactions can make the MOOC seem like the educational equivalent of fast food. Such experiences leave us wondering what a certificate, earned through a MOOC, actually signifies. A colleague of one of the authors, and someone who attends MOOCs regularly, told us recently about having signed up for a MOOC, but having attended no lectures; this learner then decided to take the final exam. For this individual, the MOOC was a review of subject matter to which the learner had already been exposed from previous educational experiences. Our colleague passed the exam and 'earned' a certificate. Granted, this individual was already familiar with some of the subject matter, but didn't do anything else in the course but take the exam. (Personal Communication, 2/27/14). What is the value of certification in this context? Additionally, in such instances, are MOOC assessments similar to the assessment of prior learning experiences undertaken at universities today through test-out alternatives such as the College Level Examination Program (CLEP)?

Finally, we know that many MOOC participants do not complete MOOCs for which they sign up. Bett's work concluded that only 50 to 55% of the registered users for the described MOOC ever signed in (2013). Lombardi (2013) indicates that reasons for not completing a MOOC include lack of time, insufficient background, and/or having joined only with the intent to view lectures, as if visiting a TED talk. Does the fact that most participants don't follow through to complete a MOOC and the consequent rarity of awarding a certificate of completion signify any increase in value in that certificate?

SUSTAINABILITY & REPUTATION

Haywood (2012) poses questions regarding how we sustain MOOCs? This is a big topic, and something that people started thinking about and debating early on in the xMOOC boom (Cator et al., 2012). Sustainability is a complex issue with sub-issues that cut across many areas including enrollments, resources, and content.

xMOOCs appear to be focusing on emphasizing scale, and are surrounded by rhetoric that suggests merely enrolling students in a MOOC equates to teaching them.

This, as Stewart (2013) points out, fits the overall narrative of MOOCs as an education technology. In this narrative, sustainability therefore is viewed through the lens of technological capacity. Can the technology scale to meet the demand? As enrollment and activity level grows, hardware needs to record, edit, store, backup and serve video and other content (Koutropoulos et al, 2013). Moreover, ideal technology creates and sustains accessible materials (Girelli, 2013). While the technological aspects of MOOC delivery do require sustainability, technological infrastructure and course materials on their own do not a course make. Therefore, we should consider teaching and facilitation resources as part of a holistic environment and design for the course.

One potential gateway for sustaining MOOCs would be to convert MOOC learners to paying students. However, there are indications that fewer than 50% of MOOC participants are motivated to gain new work skills or obtain career opportunities (Hara et al, 2013). This learner demographic seems to close off potential revenue streams and keeps MOOC providers, to some extent, out of the employment business (Kolowich, 2013c). Even if some students decide to apply and attend an institution which has offered a MOOC, how does one get 500 or 100,000 students to sign up for a MOOC (Betts, 2013)? How does one go about reaching out to learners who are the primary audience for the MOOC? Weller (2013) argues that learners need to want to be part of a product (course) in order to participate in it. This is not something that students would be seeking, but something they need to be convinced that they need to be part of.

There are, however, potential revenue streams for MOOCs. Fini (2009) and Mackness et al (2010) point to the model deployed for CCK08 (connectivism and connected knowledge 2008). The CCK08 model involved a MOOC that is both open for free, and available (at a cost) for college credit. With FSLT12[5], we also saw that there were two types of learners, those who were assessed and those who were not (Roberts, 2012). Thus, if there is a small fee for assessment, assessment processes could lead to potential revenue streams. Of course, the caveat there is that in order for students to *pay* for assessment there needs to be value associated with the certificate that they earn through assessment at the end of the course

Sustainability and reputation also go hand-in-hand. Consider the case of Georgia Tech's *Fundamentals of Online Education* MOOC (FOEMOOC), which, famously, did not go well. We see through a variety of reports, including Veletsianos (2013) and Jashcik (2013) that this MOOC's failure to launch raises questions about expectations of learners regarding a free product. Even if a product is free, learners expect a certain minimum threshold of quality. If this quality is not delivered and evident, and/or if communication is adequate, the reputation of the associated academic institution can suffer. In the case of FOEMOOC, a free host service, upon which the course was based, did not scale to the levels expected. This negatively impacted the ability for the course to launch successfully. Coupled with issues of poor communication (Veletsianos, 2013; Jaschik, 2013), this technological failure left learners with a sour taste in their mouths.

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[5] First Steps into Learning and Teaching in Higher Education 2012: A MOOC that ran from May 21, 2012, to June 22, 2013, developed by an HEA/JISC funded OpenLine Project at Oxford Brookes University.

Sustainability needs to be understood as transcending the MOOC itself, and planning should factor for potential reuse and remixing of materials created for MOOCs. MOOC course content can have a positive impact as an Open Educational Resource for institutions that create, and disseminate, such content.

COURSE CONTENT AND COPYRIGHT

Among the challenges in developing MOOCs we found issues around content, specifically content creation, dissemination, reuse, and copyright. In cMOOCs content used is generally freely available or open access, and there is engagement from the learner community that feeds content back into the MOOC, and, in essence provides kindling to the fire. In xMOOCs this isn't the case most of the time. This is where we start to see quite a few issues with the design, development, and implementation of MOOCs.

For the most part, the xMOOC has been associated with the video lecture. This is a double edge sword. An over-reliance on one medium such as video can lead to learner disappointment when those learners want to engage, and be engaged, in more ways than the video format can support. Videos are also not a panacea. Veletsianos (2013) notes that some users report finding video unengaging while Morrison (2013) notes that blog post commentary from learners indicates some learners found videos filmed in classrooms settings enjoyable because the production format lent a sense that the remote, asynchronous learners weren't there, in the classroom, with the professor. Captions and subtitles on videos were reported to be of value to learners, including learners who are not deaf or hard of hearing (Veletsianos, 2013). Adding these video production considerations on top of the existing, and potentially costly, challenges faced by producers of MOOC videos can be daunting. Even in their final forms, edited and compressed videos can take up a lot of storage space and bandwidth to delivery well, when MOOC producers adopt the professional video route. (Koutropoulos et al, 2013)

There are, of course, alternatives to creating your own videos. For instance reports of students in the Veletsianos (2013) volume indicate these learners were assigned, and used, course video materials hosted on services such as Netflix and Hulu. Incorporating subscription video services in MOOC deliveries may violate the tenets of openness; moreover, reliance on such services may exclude non-American audiences, if, in fact, these services are not available outside of the US. In some cases, even US subscriber logging into these services from an IP address outside the US will not have access to the content.

Looking beyond videos, we find another dilemma involving textual content that may be under copyright. For example, faculty at one of our institutions, when thinking about offering a MOOC, often stumbled upon fair use issues because they wanted to use materials under copyright. They perceived lack of access to copyrighted materials as a major stumbling block to MOOC development. How can one create a course without being able to give readers seminal readings in the field (Personal Communication, 2013)? It should be noted that *fair use* doesn't exist everywhere, so the international scope of MOOCs may have potential legal issues when it comes to use, and reuse, of copyrighted content.

Still, there are ways around this. The first, and most obvious, solution would be

to assign a textbook for the course. This however does have its issues. Going back to MOOC definitions, would a course still be *Open* if a textbook, potentially a quite expensive commodity, were required? How would MOOC participants react to this functional requirement for the MOOC, and would it impact participation? In 2013 we saw MOOC reports of instructor confusion over the teaching demands imposed by MOOCs, including Kolowich's report (2013b) of a professor who apparently faced criticism from MOOC learners who objected to the instructor's decision to assign a textbook that was not available for free. On alternative to a commercial textbook is to provide the materials to the learners for free, if you can, as an eBook. We saw examples of this in the course *The Ancient Greek Hero in 24 hours* offered through edX. The producers of this MOOC released a textbook, bearing the same title as the course, for free as an eBook (Wiley, 2013b). In this case, the free eBook was released before the course started which allowed learners to become engaged with the course before the official course start date.

Veletsianos (2013) reports on another course in which a learner describes highly restrictive access to materials provided in a MOOC. "A digital copy of the book was made available to the class for free in PDF format, though protected in such a way that it was posted as an image file and students could neither download the whole book, nor copy and paste text from it" (p.20). From the perspectives of instructional design and teaching one has to question the value of such content. If a learner can't engage with the content by downloading, printing, reading, and annotating, in physical or electronic format, does the content really provide value to the learner, or does it increase frustration and barriers to learning and long-term mastery? If a learner is frustrated with the materials, the cost might overweigh the benefit, encouraging the learner to give up on the course. Material accessibility issues as well as loose connections between the lessons and the materials lead to a diminished learning experience (Veletsianos, 2013, p12).

We also see some issues around facilitation of MOOCs arising from the phenomenon of learner produced, or learner sourced, content. Some reports in the extant literature address contexts in which learners were engaged well by current and easily accessed content, but found the course wasn't facilitated in a way that encouraged engaged participant behavior (Veletsianos, 2013). An agile MOOC facilitation perspective could take advantage of learner produced and learner sourced content.

Finally, we need to think more generally about the *openness* of the materials that we create for our *open* online courses. Vollmer (2012) discusses the need to keep MOOCs open and laments the trend wherein xMOOC producers have retained copyrights and licensing in order to adder the concern that their MOOC content will be "stolen" by competitors. We see examples, including in Veletsianos (2013) in which this *closed "openness"* raises potential issues for learners. If value for the MOOC learner derives from what the learner does with the content, and manifests within the community interactions that revolve around the content, closing off access to course content undermines the value of that content, no matter how well produced the content. Some scholars have decried this closed "openness," indicting the for-profit MOOC providers for having co-opted the term 'open' by for financial gain (Wiley, 2013).

TEACHING

Many have struggled to define what it means to teach within an environment scaled for Open Online Courses. Rodriguez (2011) asks what we should understand to be the proper role of an instructor in a MOOC. Kolowich (2013b) reports on one professor who walked away from his xMOOC teaching assignment because he thought participants were not learning well in the course. The professor showed reluctance to loosen his grip on students, basing his perception of the learner-teacher roles on the traditional teaching situations with which he was familiar. This relates to, and forefronts, a question regarding the expectations instructors have of learners in a MOOC. In the case reported by Kolowich, the MOOC seems to have been designed as a traditional college course, but without the standard scaffolding of a college course. Since MOOCs lack the traditional structures and feedback mechanisms of traditional college coursework, including grades and the earning of credits, how should MOOC teaching and instructional design accommodate the accompanying difference in learning setting? Kolowich reports this same instructor spent a great deal of time attempting to respond to student feedback—an effort chronicled in the many addendums on what was described by the professor as "housekeeping issues" with the MOOC. This situation highlights how much time a course facilitator must spend supporting learning a MOOC, and times such efforts reach diminishing returns. A MOOC isn't the same as a traditional course, so the modus operandi of the traditional instructor supporting a traditional course requires serious reconsideration and adjustment.

Through Kop et al (2011), we can identify the deficiencies of having a small number of facilitators for a large number of participants. The authors note that a teacher generally *cannot* be the sole focus of a student's experience in a MOOC. Recognition of this is evidenced by Harvard University's March 2013 call for alumni of their *Ancient Greek Hero* course to serve as unpaid mentors and monitors within the course discussion forums (Stewart, 2013). We also see cases in which MOOC students have reported learning a lot from fellow participants; examples include the FSLT12 MOOC (Roberts, 2012).

Dispersion of the teaching role raises questions about what constitutes a good mix of novice, intermediate, and advanced learners in a MOOC who can help one another in the learning journey. Kop et al (2011) raise related questions asked early in the history of MOOCs, including questions about what motivates people to regulate their learning and about which factors of learning environment design are important to support learner self-direction in Open Online Courses. Moreover, what is the place and role of the educator in such an environment?

As we determine the roles of teachers in Open Online Courses, the caution is to keep an open mind and not privilege one aspect of the instructor function over others. Teaching is not necessarily about top-down control of a classroom. In addition to didactic teaching, there are various other aspects to teaching, such as facilitating, mentoring, coaching, peer teaching, and so on. One mode of teaching may not be a panacea, applicable to all instances in which learning and teaching might take place. The MOOC, as an environment, does provoke us to rethink and reconsider our approaches to teaching. In general, the pedagogy of a traditional course is not necessarily applicable to a MOOC, and teaching practices should never be exempt from scrutiny.

CULTURAL COMMUNICATION, AND CULTURAL HEGEMONY

The mainstream narrative suggests that xMOOC could bring education to those who are not served by traditional demographics at home and abroad. The stories involving learners, eager to learn, who have been trampled as they vie for the few remaining spots of the university (Koller, 2012), and anecdotes of a minority of gifted pre-college students abroad doing well in a college engineering course (Agarwal, 2013) certainly support that narrative; the narrative draws on the human need to triumph over adversity. This is all great rhetoric, but what we are seeing, too, is that we aren't just dealing with altruism. In a *Fast Company* article, Udacity's Thrun expresses a feeling of emptiness even though his traditional classroom courses at Stanford University are packed. His question is "What are 200 students [in a large lecture hall] in an age when billions of people around the world are connected to the Internet?" (Chafkin, 2013). This seems to indicate reasons other than altruism for pursuing MOOCs, at least from the standpoint of the "Elite" university. There is definitely a sense of personal fulfillment for educators who are choosing to teach in this mode.

To make things worse, others, such as Shirky (2012) repeat the all too familiar mantra of the "best lectures, from the best professors, from the best universities" when discussing MOOCs and when suggesting MOOCs constitute a disruption of higher education. However, how does one define "best," and isn't this a form of cultural hegemony, even within the western context? At its core, this rhetoric asserts that the lecture is the best format, which it may not be, and endorses, and proclaims that, certain professors and certain universities are "the best." This is quite a simplistic view of what it means to be a great educator and, in the MOOC context; it makes potentially great educators invisible to others.

So, who controls the knowledge in MOOCs? The majority of courses offered in the MOOC format are provided by universities in the United States and other Western countries. Instructional design and education practices vary from country to country based on the educational tradition of that culture, yet traditional course practices of the United States are in the ascendancy, in MOOC designs around the world. Although this fact isn't necessarily apparent in current MOOCs (Airbach, 2013), we can see an example of the US design bias in European MOOC producers who seem to have based their own platform, and subsequent course design decisions, on the norms of US-based MOOC platforms (Koutropoulos, 2014). The current adoption of US norms has the potential to inhibit the emergence of local academic cultures, local content, and courses tailored for specific national audiences (Airbach, 2013) and thus pedagogical innovations that benefit everyone may be never be brought forward to enrich this MOOC experiment.

Finally, we see the issue of language dominance emerge. As early as PLENK2010[6] we began to see a diversity of languages spoken in a MOOC with one-third of participants coming from non-English speaking countries (Kop, 2011). Cabiria (2012) points out issues with learners needing to have language access. Subtitling videos in

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[6] Personal Learning Environments Networks and Knowledge: A cMOOC which ran in 2010 and was facilitated by George Siemens and Stephen Downes. For more information please see: http://connect.downes.ca/

another language may not be enough when the cultural context of a video is still foreign. Not uncommonly, video content involves underlying cultural knowledge. MOOC participants who are not of the culture may not comprehend Western-skewed video content used as foundational material in MOOCs. If you try to provide an education to those who traditionally don't have access to education, in fulfillment of the xMOOC rhetoric, and do so without an understanding of the intended audience, you are most likely going to end up exporting your own views on education to the world at large. Education should be a more inclusive practice.

CONCLUSION

As a research topic, and as an instantiation of Open Education, MOOCs are truly fascinating. We believe that MOOCs have a lot to offer in the world of education, both in higher education and vocational training. Although we are excited about the prospects of innovation through MOOCs we have discovered a number of challenges and issues with MOOCs that really ought to be kept in mind, and considered, when thinking about offering MOOCs, and when designing and implementing MOOCs. From a research perspective, we all need to take a more nuanced view of the potential challenges and issues that have come up in our research. The taxonomy developed in this chapter provides an initial roadmap for further exploration of the general issues and suggests potential addresses to the challenges involved in MOOCs.

Through our initial typology we've identified areas of concern, including academic governance and business issues such as sustainability; we've established the importance of conducting needs analyses, especially analysis of the motivations and backgrounds of our learners; the need for better instructional design, technology implementation and usage, and teaching practices; and finally challenges around aspects of certification and accreditation. It should be noted, again, that these elements in the typology do not stand as islands on their own. Each item has the potential to influence and affect other elements in this typology. As such we hope that readers understand the interconnected nature of these issues that arise from practicing connected pedagogies. We hope that this initial typology will be expanded on and will serve as a springboard for further research into the design and practice of MOOCs.

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