

Instructor Experiences in Designing and Delivering Interactive MOOCs in Higher Education

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Abstract

There is a pressing need to better understand the instructional design and delivery methods of instructors of massive open online courses (MOOCs). In response, this mixed method study focused on how MOOC instructors encourage online interaction. The data sources were an online survey delivered to over 1,400 MOOC instructors, of which 143 valid responses were received. In addition, there were interviews with 12 instructors and course reviews of their MOOCs. To encourage online learner interaction, these instructors utilized asynchronous discussion forums, pair-based assignments or peer reviews, and social media to encourage peer interaction. At the same time, learner-instructor interaction was encouraged through online discussion forum, platform messages, and social media connections. In terms of learner-content interaction, MOOC instructors primarily relied on discussion forums, video lectures and tutorials in the MOOC, readings, and practice quizzes and exams. Implications and future directions for research on MOOC instructors are provided.

Introduction

Alternative forms of teaching and learning have proliferated over the past decade toward more open and online learning (Bonk, 2009). One such experimental approach is the massive open online course or MOOC (Bonk, Lee, Reeves, & Reynolds, 2015). In fact, MOOCs have grown during the past few years to over 7,000 such courses (Shah, 2016, 2017). It is important to point out that most research on MOOCs has mainly focused on enrollment, perspectives, behaviors, completion rates, and participation patterns in MOOC environments from a learner perspective (Breslow et al., 2013; Liyanagunawardena, Adams, & Williams, 2013). However, few studies have examined the instructional design and delivery of instruction using MOOCs from an instructor perspective (Margaryan, Bianco, & Littlejohn, 2015; Watson et al., 2016). Such studies of the design considerations and pedagogical approaches of MOOC instructors as well as their training needs are increasingly vital.

The nature of online learning, such as the separation of instructors and learners, makes instructional design critical for online learning (Johnson & Aragon, 2003). Design and final delivery greatly influence students' interaction and engagement in online learning (Garrison & Cleveland-Innes, 2005). For example, Garrison and Cleveland-Innes (2005) found that online course design and pedagogical approach influences learning and online interaction. This finding also applies to massive open online courses (MOOCs), which have emerged as an innovative form of online learning. The design and delivery of MOOCs can greatly influence student engagement, deep and meaningful learning, and completion rates (Keyek-Franssen, 2017; Pappano, 2012). MOOCs have faced criticisms, including low quality instructional design (Margaryan, Bianco, & Littlejohn, 2015) and limited online interaction.

However, there is a scarcity of studies that focus specifically on MOOC design and delivery (Margaryan, Bianco, & Littlejohn, 2015); especially online interaction and engagement (Wang, Anderson, Chen, & Barbera, 2017). Given that the instructor is one of the five key elements of a MOOC (Kop, 2011), this study hopes to lend insights into how instructors are designing and delivering MOOCs to encourage interaction and monitor learning. Mixed methods (Creswell & Clark, 2007) (i.e., online surveys and interviews via Web conferencing) were used to explore the practices of MOOC instructors from a variety of disciplines. This study hopes to help reveal common and successful instructional design and delivery practices in terms of online interaction within MOOCs. To this end, the following three research questions guided this study.

- (1) How do MOOC instructors design their courses to encourage interaction among learners?
- (2) How do MOOC instructors design their courses to encourage interaction between instructor and learners?
- (3) How do MOOC instructors design their courses to encourage learner-content interaction?

Theoretical framework

Massive Open Online Courses (MOOCs) in Higher Education

The wide-spread employment of MOOCs is a relatively recent phenomenon which basically began in 2008 and accelerated around 2011 and 2012 (Bonk et al., 2015). This movement toward MOOCs offers a viable, scalable, and sustainable alternative form of higher education (Selwyn, 2015). Some educators and politicians even consider MOOCs to be a transformation of higher education (Barber, Donnelly, & Rizvi, 2013) that has the potential of democratizing higher education (Daniel, 2012; Koller, 2015). Not convinced? In terms of scale, Ebben and Murphy (2014) found that MOOCs enrolled learners from 194 countries. In addition, Dillahunt, Wang, and Teasley (2014) discovered that MOOC learners who self-identified that they could not afford formal higher education had higher completion rates if they intended to obtain a certificate.

On the other hand, MOOCs also face many criticisms from those in higher education as well as all other sectors of education. For instance, some instructors question whether MOOCs can provide the same quality of learning experiences as traditional online learning or face-to-face classroom learning in terms of instruction, access, and learner engagement (Rhoads, Berdan, & Toven-Lindsey, 2013). Canadian MOOC researcher, Rita Kop (2011), stated that MOOCs were designed for the benefit of massive amounts of learners but with lower amounts of instructor and learner interaction; thus, they require learners to be self-regulated and engaged. Naturally, some learners may struggle in a MOOC environment with less structure and instructional support (Kop, Fournier, & Mak, 2011).

Online Interaction

Among the most common frameworks related to the types of online interaction is Moore's (1989) "Three types of interactions" which includes learner-learner, learner-instructor, and learner-content interactions. Learner-learner interaction involves a two-way reciprocal communication between or among learners which increases their intellectual achievement (Moore, 1989). In effect, learners support each other in the learning process. Learner-instructor interaction is a two-way communication between the instructor (or multiple instructors) and learners (Moore & Kearsley, 1996). This represents the myriad opportunities for instructors to provide relevant learner feedback and evaluation, get to know learners, and perhaps change teaching strategies at midstream (Moore, 1989). Learner-content interaction refers to a one-way process of learners elaborating and reflecting on the subject matter or the course content (Moore, 1989). Importantly, Chaves (2009) contends that the interaction of learners with the content initiates an internal didactic conversation.

In online learning environments, interaction plays a key role in teaching and learning experiences (Conrad, 2014). Hence, there has been much attention devoted to building interaction and engagement in fully online and blended learning environments (Bonk & Khoo, 2014; Bonk & Zhang, 2008). Similarly, interaction among learners, between learners and the teacher (or sets of teachers), and between the learner and the learning content is essential in MOOCs (Wang, Anderson, Chen, & Barbera, 2017). Some MOOC researchers have started to examine the patterns of interaction and communication used in connectivist learning environments (Milligan, Littlejohn, & Margaryan, 2013; Siemens, 2011). Milligan et al. (2013) interviewed a few MOOC learners, whereas a 2011 study by George Siemens focused on learners in the single CCK08 forum. In effect, many early MOOC researchers have primarily interviewed learners or analyzed discussion forum interaction in a single MOOC (Wang, Anderson, Chen, & Barbera, 2017). It is now vital to extend MOOC research beyond such small-scale studies.

Kop (2011) states that, among key elements in MOOCs such as instructors, learners, topic, materials, and context, instructors are one of the important elements. However, few studies examine MOOCs interaction from instructor perspectives (Veletsianos & Shepherson, 2016); of those that do, most, in fact, examine the perspectives of a lone instructor in a single MOOC. In response to this gap in the research, this study examined the various ways MOOC instructors design and deliver their courses to encourage online interaction. It was hoped that by examining MOOC design practices and considerations from a wide array of MOOCs that better understandings of the planning processes, concerns, and decisions of MOOC instructors might unfold.

Methods

Survey methods were employed to investigate how MOOC instructors design and deliver their courses to encourage interaction and learning success. Participants are MOOC instructors from universities around the world and educational institutions such as the World Bank Institute. The key data sources of this study included: (1) an online survey sent via SurveyMonkey to 1,400 MOOCs instructors from around the world which resulted in 143 valid responses; (2) interviews (522 minutes) with 12 instructors who volunteered to participate interview via web

conferencing in Zoom; and (3) course reviews of the MOOCs of the 12 MOOC instructor interviewees. The researchers were able to validate and cross-check the findings using different data sources (Patton, 1990). This triangulated research approach provided a more nuanced understanding of instructors' MOOCs design considerations and challenges than relying solely on one data source (Baxter & Babbie, 2003).

As indicated, the online survey was distributed to more than 1,400 instructors whose MOOCs were listed in online platforms such as Class Central, the MOOC list, Coursera, edX, FutureLearn, and Open2study. The researchers crosschecked the information of the MOOCs for duplicity and errors.

Descriptive statistics embedded in SurveyMonkey were used to analyze survey closed-ended data. In addition, content analysis was used to analyze the transcribed interviews and the open-ended questions by inductively coding emerging themes (Elo, & Kyngäs, 2008; Graneheim & Lundman, 2004). Researchers read the transcripts and conducted the open coding individually.

Results

The MOOC instructor participants (n=143) had highly diverse subject backgrounds. The top five subjects that MOOC instructors in this study taught included medicine and health (16%), computer science (14%), education (11%), language and literacy (8%), business (6%), and engineering (6%). Given that these MOOC instructors were from different subject areas with various backgrounds, it was not surprising that their ways of encouraging online interaction in their MOOCs significantly varied.

Research Question (RQ) 1: How do MOOC instructors design the course to encourage interaction among learners?

As indicated, it was deemed important to obtain a sense of how MOOC instructors encouraged interaction in the design and delivery of their massive courses. According to the results, about 75 percent of the MOOC instructors surveyed utilized asynchronous discussion forums to foster encourage peer interaction. Additionally, nearly one-third of them (31.6%) utilized pair-based types of tasks and one-fifth of them (21.3 %) tried out social media like Facebook and Twitter for nurturing engagement and interaction among those enrolled in the MOOC. Aligned with these survey results, one interviewee mentioned the following:

“And then there's also an asynchronous discussion boards within each module. So there will be prompt. And a lot of them are a “show and tell” type of thing...And then there were a lot of discussions back and forth with students about suggestions on things they could consider, or maybe there were stuck on something and so they would like help...Within discussion forum, there's a showcase and that is the opportunity to get feedback from peers.”

RQ2: How do MOOC instructors design the course to encourage interaction between instructor and learners?

Besides peer interaction, it was also important to explore the strategies and techniques employed to foster instructor and learner interaction. Naturally, in a MOOC, direct forms of interaction between instructors and learners might be not as prevalent or expected. Surprisingly, our survey findings revealed that a majority of the MOOC instructors (82%) who responded did, in fact, interact with learners through online discussion forums. Of course, unlike what might be found in a smaller online class, it is doubtful that they interacted with a majority of those enrolled. The survey data also showed that they less often relied on platform messages (26%), social media connections (21%), personal emails (20%), and virtual meetings (10%) (see Figure 2). None of the survey respondents utilized phone calls/messages for interaction. Somewhat surprisingly, sixteen instructors did not think instructor-learner interaction was applicable to their MOOCs. In similarity to the survey data, one interviewee also mentioned that she used discussion forums to interact with students: “We monitor discussion boards as well. That would not necessarily be like formal assessment. We're just wondering how students are engaging with material. So it's an indicator for us but not a measurable one”

Despite instructors using a variety ways for instructor and learner interaction, there seemed to be a lack of instructor-learner interaction in MOOCs. One instructor stated:

“Because there's not much interaction, even between me and students. When I first launched this MOOC, I paid closer attention. Maybe I replied to some students. Now I think Coursera somehow grabs some students to be mentors or something. There are other people commenting. It seems like I do not have to do anything. Every week, perhaps three hundred more students register. Nobody bothers me.”

Monitoring and tracking learner progress is especially vital in a MOOC. Of course, the analytic data provided by the MOOC platform or system can enable a greater degree of tracking than seen in traditional classroom settings. In this study, about 37% of the instructors tracked student progress at the modular or unit level. Slight more

than one in three (35%) MOOC instructors relied on weekly or daily reports from system generated learning analytics and the same percentage found ways to allow students to engage in self-monitoring and self-evaluation. Slightly less than one in five (18%) of MOOC instructors had moderators or teaching assistants take control of monitoring learner progress. Other techniques employed included peer or group member reports (13%), personal tracking from tutors, moderators, and teaching assistants (9%), and personal tracking from the instructor (3%). Given the immense size of these MOOCs, it was not too surprising that 21 (15%) of the MOOC instructor respondents did not bother to monitor student learning progress in the MOOC.

Naturally, feedback is a vital aspect of any course; especially those delivered online where one may feel alone and isolated when posting or contributing. As a result, one of our survey items explored feedback techniques used by MOOC instructors. The most common form of feedback was peer based (63%). The next most often form of feedback was to rely on the technology platform or computer system to offer feedback (54.5%). Other forms of feedback included that from the course TAs (40%) and assignment rubrics (34%). However, only 30% of MOOC instructors offered learners feedback and just 5% relied on outside experts for such. Slightly more than one in four MOOC courses utilized self-feedback.

RQ3: How do MOOC instructors design the course to encourage learner-content interaction?

In terms of learner-content interaction, instructors provided a wide array of learning resources and chances for learners to interact with the course contents. As an example, roughly 90% of the MOOC instructors activated discussion forums or threads for their learners. Nearly eight in 10 (78%) of these instructors embedded video lectures and tutorials for those enrolled to learn from. Slightly fewer (74%) relied on article or book readings. More than half (55%) designed practice quizzes and exams for their students, while less than half (45%) incorporated interactive assessments. Other resources supplied in respondent MOOCs included expert interviews (54%), PowerPoint and other presentation slides (41%), instructor lecture notes (40%), visuals (e.g., concept maps, diagrams, etc.) (36%), and animations and other types of interactive contents (34%).

One professor from the U.S. stated that: “Besides videos, there was a suggested book.” Another instructor noted that she used visuals in her MOOC “I had a whole lot of graphical material that I used in class. And I had got them from one of the texts that were published in the area and had been allowed to use them, because I was recommended the textbook.”

Significance

The findings of this study indicate that instructors are experimenting with a variety of techniques and strategies to increase online interaction when designing and delivering their MOOCs. In this study, most MOOC instructors emphasized a variety of strategies to encourage learner-learner interaction and learner success. For example, many employed asynchronous discussion forums, pair-based assignments or peer reviews, and social media to encourage peer interaction. Additionally, learner-instructor interaction was encouraged through online discussion forum, platform messages, and social media connections. Regarding the learner-content interaction, discussion forums or threads, video lectures and tutorials in the MOOC, readings, practice quizzes and exams were among the primary vehicles employed in MOOCs. Of course, any generalizations are difficult and highly tentative during this initial phase of online interaction in MOOCs.

This study indicated that MOOC instructors are trying to encourage online interaction in MOOC; however, there is no universal understanding of strategies of encouraging online interaction and instructor-learner interaction is still not positive. Besides the survey data, instructor interviews, and the content reviews of MOOCs, further observations and analyses are needed to better understand how MOOC instructor design and deliver their MOOCs to encourage online interaction and learner success.

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Appendix

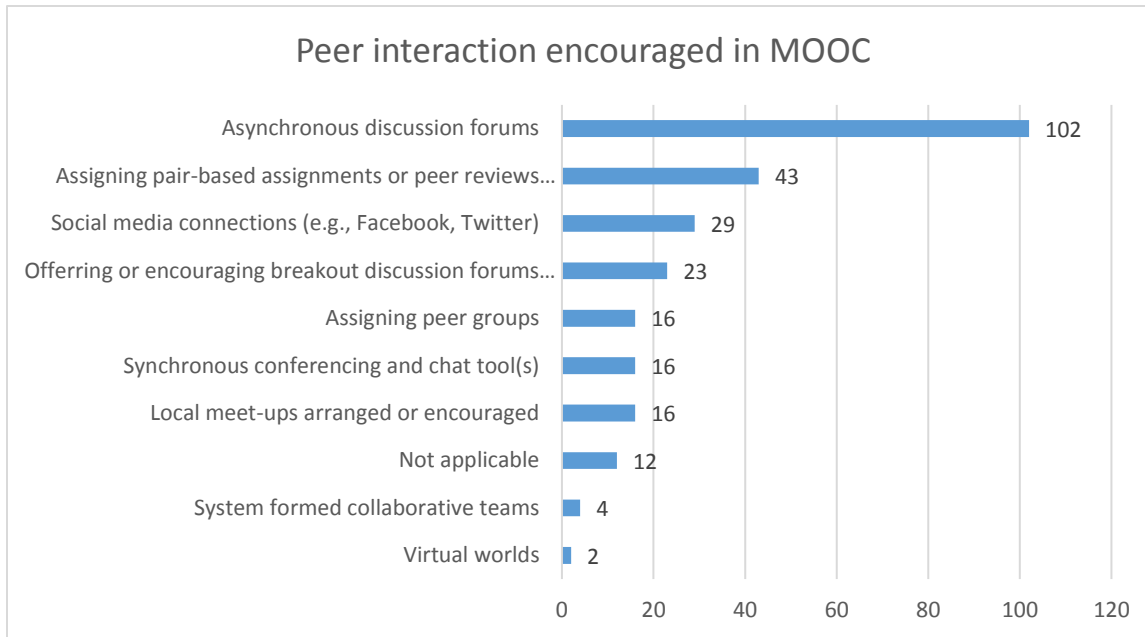


Figure 1: MOOC instructors (n=136) practices to encourage peer interaction

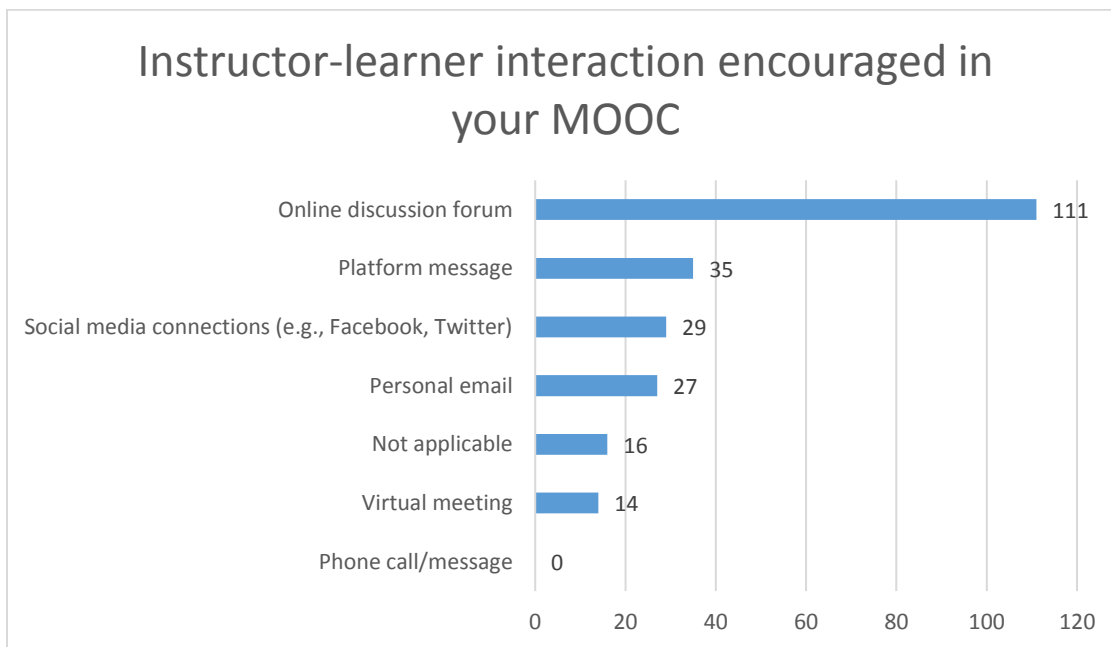


Figure 2: MOOC instructors (n=136) practices to encourage instructor-learners interaction