

Instructor Experiences in Designing MOOCs in Higher Education: Considerations and Challenges

Meina Zhu, Curtis J. Bonk, Annisa Sari, Indiana University

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Abstract

This mixed methods study explores instructors' design considerations and challenges in massive open online courses (MOOCs) to enhance the design of MOOCs. An online survey was sent to 1,400 MOOCs instructors worldwide with 143 valid responses. Twelve instructors were interviewed and their MOOCs were reviewed. There were a variety of considerations and challenges in MOOC design in terms of resources, pedagogy, and logistics. The pedagogical considerations and challenges included learning objectives, assessments, and engagement. Among the resources considered were the affordance of platforms and support from institutions. Time limitations related to designing MOOCs was the main logistical consideration and challenge. To address these challenges, these instructors browsed other MOOCs as well as sought help from the platform, institutions, and colleagues.

Objectives/Purpose

Massive open online courses (MOOCs) continue to increase (Authors, 2015; Conole, 2015; Watson et al., 2016). In 2016, the total number of MOOC participants was over 58 million, and around 7,000 MOOCs were offered (Shah, 2015, 2016). Thus, MOOCs have become a critical area of research (Breslow et al., 2013). Instructors' design of MOOCs can greatly influence student engagement, meaningful learning, and completion rates (Pappano, 2012; Yousef, Chatti, Schroeder, & Wosnitza, 2014). Not surprisingly, instructors face challenges designing more personalized MOOCs that can meet individual learner needs (Authors, in review; Beaven, Hauck, Comas-Quinn, Lewis, & de los Arcos, 2014; Watson et al., 2016). However, there is a scarcity of studies specifically focusing on the design of MOOCs (Brouns et al., 2014; Lowenthal & Hodges, 2015; Margaryan, Bianco, & Littlejohn, 2015); especially those which evaluate instructor perspectives on their design considerations and challenges (Ross, Sinclair, Knox, & Macleod, 2014; Watson et al., 2016).

Therefore, the purpose of this study is to explore design considerations and challenges when designing MOOCs from instructor perspectives. The underlying intent is to better understand MOOC instructor design experiences and provide suggestions for future MOOC instructors. With such goals, the three research questions listed below guided this study.

- (1) What design considerations do instructors consider when designing MOOCs?
- (2) What challenges do instructors perceive when designing MOOCs?
- (3) How do MOOC instructors address the challenges that they perceive?

Theoretical Perspectives

MOOCs in Higher Education

Massive Open Online Courses (MOOCs) are open online courses with the open registration and massive learners (McAuley, Stewart, Siemens, & Cormier, 2010; Veletsianos, Collier, & Schneider, 2015). Currently, MOOCs are generally offered by instructors from universities, which were in partnership with providers such as Coursera, Edx, and Udacity (Conole, 2015; Daniel, 2012). For example, Coursera, one of the fastest growing MOOC providers, offered more than 1,000 courses from 112 universities (Evans & Myrick, 2015). The MOOC movement, which offers more viable and scalable higher education (Selwyn, 2015), is considered a transformation of higher education (Barber, Donnelly & Rizvi, 2013; de Freitas, Morgan, & Gibson, 2015; Friedman, 2013) and has the potential of better democratizing it (Koller, 2015).

MOOCs Design Considerations

Appropriate instructional design in MOOCs can engage learners and promote meaningful learning (Pappano, 2012; Yousef, Chatti, Schroeder, & Wosnitza, 2015). MOOC design is guided by the elements such as time, available technology, and team collaboration (Najafi, Rolheiser, Harrison, & Haklev, 2015).

Alario-Hoyos, Pérez-Sanagustín, Cormier, and Kloos (2014) classified MOOC design considerations into three categories: resources, pedagogy, and logistics. The available resources include technology and human resources (Alario-Hoyos et al., 2014). Some researchers have advocated participatory learning environments and peer support (Ahn, Butler, Alam, & Webster, 2013), providers and universities supports, and a collaborative community (Watson et al., 2016). In contrast, others have emphasized cohort-driven pedagogical design, the expectations and motivations of taking MOOCs, personalizing learning design (Malin, 2015; Walji, Deacon, Small, & Czerniewicz, 2016), learners' previous knowledge (Phan, McNeil, & Robin, 2016), building scaffolding, and encouraging participants' articulation and reflection (Salmon, Pechenkina, Chase, & Ross, 2016).

Logistics is another consideration in MOOC design such as time required to plan MOOCs and establishing teaching presence during the course (Arnold, Kumar, Thilloson, & Ebner, 2014; Holland & Trithali, 2014; Najafi, Rolheiser, Harrison, & Haklev, 2015).

MOOCs Design Challenges

The scale and participant heterogeneity in MOOCs bring design challenges in MOOCs (Authors, 2018). The design challenges include promoting learners' active participation (Anders, 2015), peer assessment (Kulkarni et al., 2015; Phan et al., 2016), interaction, and the heavy demands of time and money (Hew & Cheung, 2014; Milligan et al., 2013; Waite, Mackness, Roberts, & Lovegrove, 2013). Fournier and Kop (2015) discovered other challenges such as providing personalized learning environments, ethics and privacy issues, and the use of personal learning data in the research and development process. However, there is a scarcity of empirical studies which specifically investigate both design considerations and challenges in MOOCs (Ross et al., 2014; Watson et al., 2016).

Methods

This study used a sequential mixed method design (Creswell, & Clark, 2007) to explore instructors' MOOC design considerations and challenges. The key data sources of this study include: (1) online survey sent to 1,400 MOOCs instructors from around the world via SurveyMonkey with 143 valid responses (10% response rate); (2) interviews with 12 instructors who volunteered to participate; and (3) course review of the MOOCs of the 12 interviewees. It is important to note that the survey results helped in crafting and revising the interview questions as well as in selecting interviewees. In addition, the MOOC review helped triangulate the interview data. The researchers validated and cross-checked the findings using different data sources (Patton, 1990). This approach provided a more nuanced understanding of instructors' MOOCs design considerations and challenges than relying solely on one data source (Baxter & Babbie, 2004).

Prior experience of MOOC teaching and designing is the primary selection criteria for survey participation. Twelve instructors were selected for the interviews, representing a wide selection of countries and subject areas. These interviewees were from the U.S. (n=4), UK (n=2), China (mainland and Hong Kong) (n=2), Canada (n=1), Australia (n=1), Sweden (n=1), and India (n=1). The subjects that these instructors taught included math, education, public health, computer science, chemistry, and language and literacy. The providers of these courses were Coursera (n=6), FutureLearn (n=2), edX (n=2), Canvas (n=1), and Open2study (n=1).

The survey data was analyzed using descriptive statistics embedded in SurveyMonkey. The transcribed interviews and the open-ended questions were inductively coded for emerging themes using content analysis methods (Elo & Kyngäs, 2008; Graneheim & Lundman, 2004). Two researchers read the transcripts and conducted the open coding individually. Once the individual coding was completed, the researchers discussed any discrepancies and reached consensus on categories and themes.

Results

Instructor participants (n=143) came from diverse backgrounds; i.e., medicine and health (16%), computer science (14%), education (11%), language and literacy (8%), business (6%), and engineering (6%) (see Figure 1). Their design experience varied. Instructors (n=139) ranked on a scale of 1 (Strongly disagree) to 5 (Strongly agree) whether they had many experiences related to designing fully online or blended courses prior to designing their MOOCs. On average, they did not have many previous online design experiences ($M=2.52$, $SD=1.47$) (see Figure 2). Most of them had just designed one MOOC (see Figure 3). In terms of current MOOC design, most of them were fully involved in designing MOOCs ($M=4.63$, $SD=0.81$) (see Figure 4) and enjoyed designing their MOOC ($M=4.21$, $SD=0.95$). Overall, most MOOC instructors had limited MOOC design experience.

In terms of the MOOC format, 50 out of 143 MOOC were instructor-led with teaching assistant support, while 32 instructors had no such support (see Figure 5). Besides instructor-led MOOCs, 23 MOOCs were self-paced and 23 were primarily learner driven (i.e., cMOOC). Only five out of 43 MOOCs (4%) were hybrid or blended types of MOOCs.

Research Question (RQ) 1. What design considerations do instructors consider when designing MOOCs?

When instructors design MOOCs, most of the instructors (75%) considered the learning objectives of the course. In addition, 92 out of 139 instructors (66%) took assessment into consideration and 84 instructors (60%) considered the duration of the course. Roughly half of the respondents considered the time it took in designing their MOOC ($n=71$) and the platform for offering the MOOC ($n=69$). Other findings included that 48% of instructors considered their pedagogical approaches and 47% of instructors considered the course content to be delivered (see Figure 6). Aligned with the survey results, one interviewee from the U.S. mentioned, “The learning objectives was my most important thing each week. I would think questions such as: What are my learning objectives this week?”

Assessment was another main design consideration which aligned with Watson et al. (2016). Among 134 respondents, 56 instructors (42%) used the learning management system to assess students’ learning, 18 instructors used a sharing portal, and 11 instructors asked students to present during final class (see Figure 7).

Engaging learners is one of the MOOC design considerations. To engage MOOC participants in learning, 93 out of 136 instructors (68%) provided certificates, 59% instructors used self-paced learning in the MOOC, 57% provided optional readings, videos, or other materials, and 41% encouraged learners to design authentic projects (see Figure 8). One instructor from the UK mentioned:

When we were designing, we tried to have a hook for each week, a reason for learners to come back each week. So, we built that into our learning design. So what's going to be the big thing that makes you want to join the course in Week One.

Survey respondents were asked about the degree to which they considered unique learners’ needs while designing their MOOC ($M=3.84$, $SD=1.05$) (see Figure 9). To address students’ varying competencies and needs, 74% of instructors ($n=103$) established learner-based discussion forums, 67% of instructors ($n=93$) embedded supplementary course materials, and half of the respondents ($n=70$) posted timely course announcements and emails (see Figure 10).

RQ 2. What challenges do instructors perceive when designing MOOCs?

Instructors also faced many challenges while designing MOOCs. More specifically, 91 out of 143 instructors (68%) had challenges regarding assessments methods (see Figure 11). In addition, seventy instructors (52%) thought engaging student learning was challenging. Nearly half of the respondents considered finding strategies to engage students in active participation (49%) and interaction (46%) to be difficult. As previously reported by Watson et al. (2016), a similar percent noted that time limitations when designing MOOCs (48%) was challenging.

Another instructor from China noted the challenge of assessment because of the massive amounts of learners. Consequently, he expected to automatically grade every kind of assessment. He stated that:

One challenge, of course, is that you have a lot of students. And you have

probably more assessments if you have students who have more submissions. Then you or your TAs could not handle. Nobody wants to do grading. So you need automated grading.

RQ 3. How do MOOC instructors address the challenges that they perceive?

To address challenges mentioned above, 66% of instructors browsed other MOOCs to get ideas, examples, and benchmarks. In addition, 60% of instructors seek help from the platform. More than half of the respondents seek help from colleagues (53%) and institutions (50%).

Aligned with survey results and previous study (Alario-Hoyos et al., 2014; Belanger & Thornton, 2013), instructors mentioned that teamwork is a great way to face challenges. One instructor said, “It was amazing to have such support on the development side... There was always a discussion... So the challenges were never greater than the team here.”

Discussion and Significance of this Study

This study explores the design considerations and challenges of MOOC instructors when they create their MOOCs. The goal is to better understand instructors’ design experiences in MOOCs and provide suggestions for future MOOC instructors. As mentioned in the results section, instructors were highly involved in the MOOC design process. They considered a variety of aspects while designing MOOCs including pedagogy, resources, and logistics. Pedagogical considerations included the learning objectives, flexibility, the assessment methods, and collaborative learning support. Resource considerations included the affordance of MOOC platforms, support from the institution and platform, and available intellectual resources. Instructors also considered logistics such as the time spent designing the MOOC.

When designing their MOOCs, instructors faced several substantive challenges including finding the means to engage students, fostering student interaction, condensing lectures in short videos, personalizing and monitoring learning, coping with time limitations, and limited assessment methods. These challenges were often addressed by browsing other MOOCs as well as seeking help from the MOOC platform, colleagues, their institutions, or other instructors who have taught MOOCs.

This study offers insights on MOOC design considerations and challenges as well as ways to address these challenges. The results may inform instructional designers, instructors, and other stakeholders of what should be considered in the design of MOOCs. The online survey and interviews were just the first steps in the process. Deep course review, follow-up course observations, and inquiry into the learners’ perspective will further inform the methods to design effective MOOCs.

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Appendices

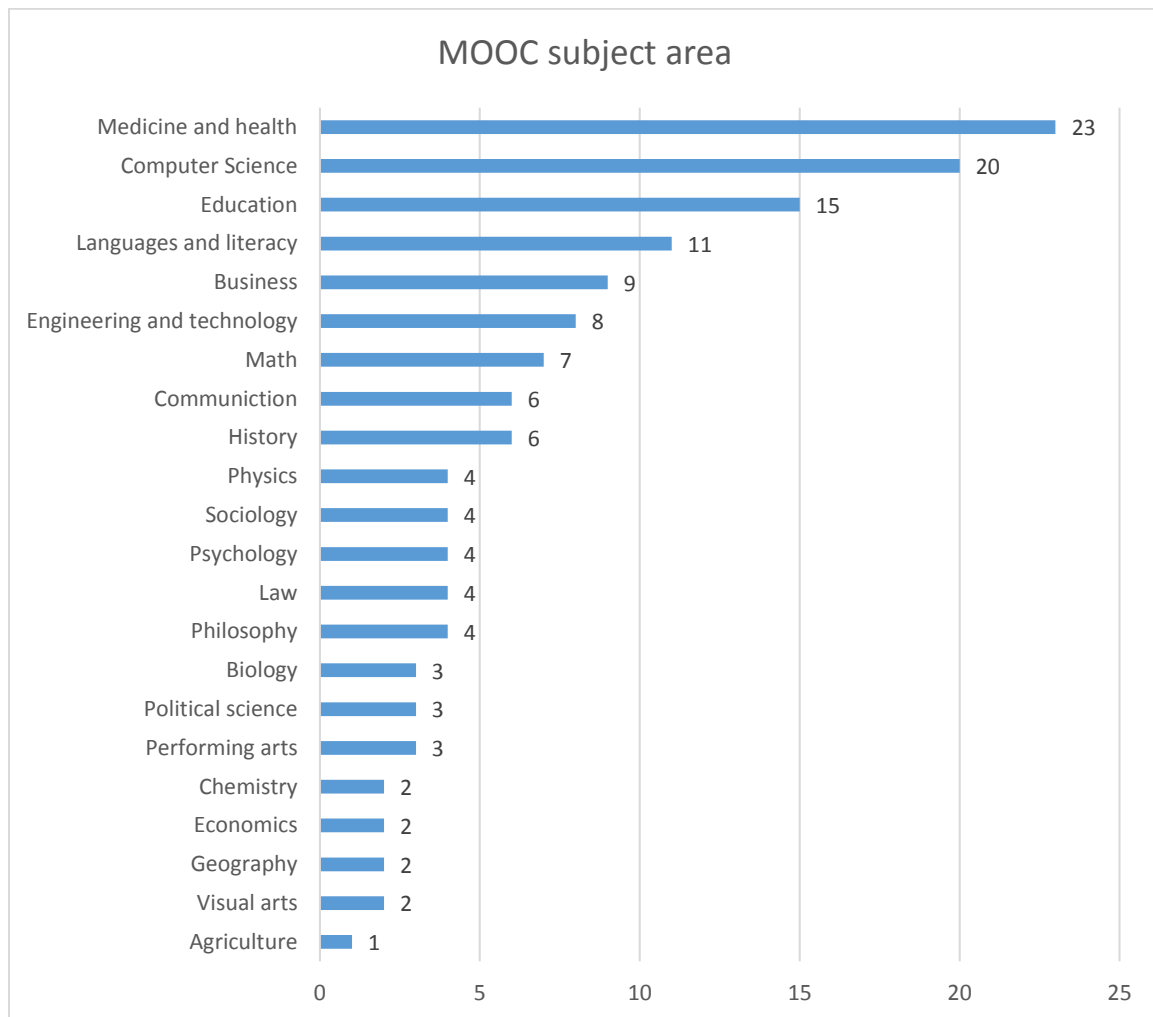


Figure 1. The MOOC subject areas taught by the survey participants

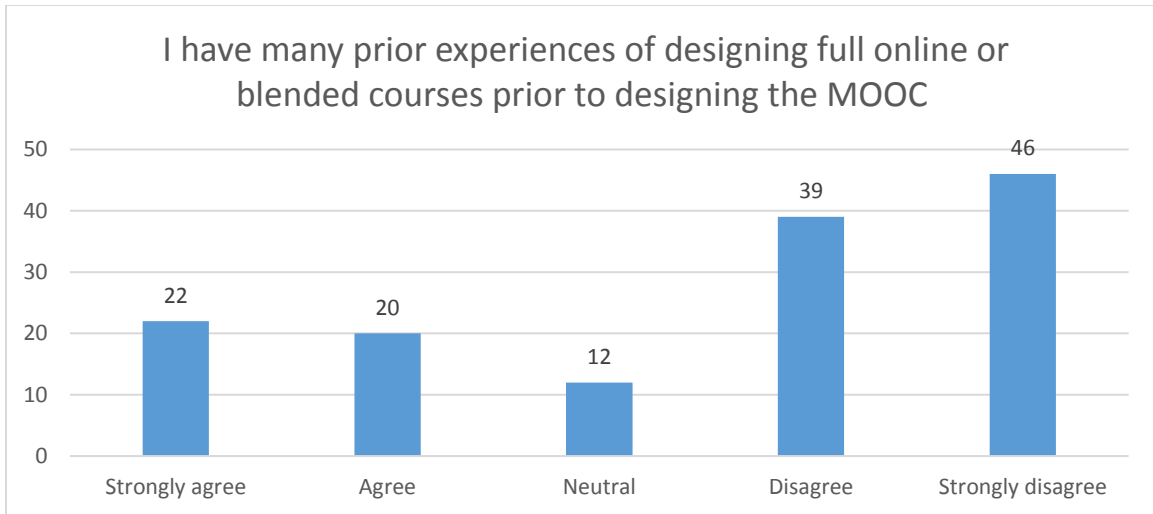


Figure 2. Instructor experience of designing fully online or blended courses prior to designing the MOOC

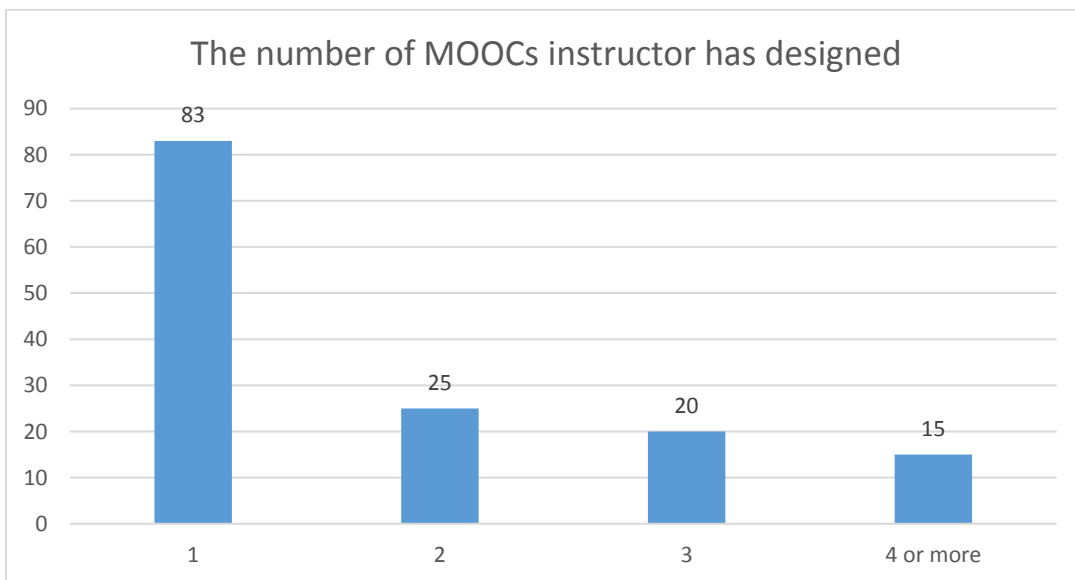


Figure 3. The number of MOOCs that the instructor had designed

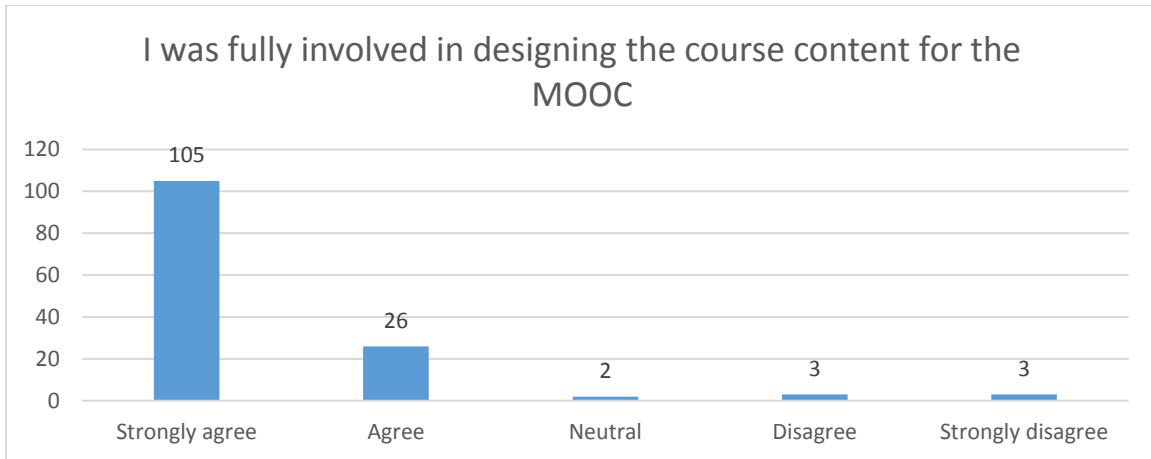


Figure 4. Instructor perceptions of whether they were fully involved in designing their MOOC

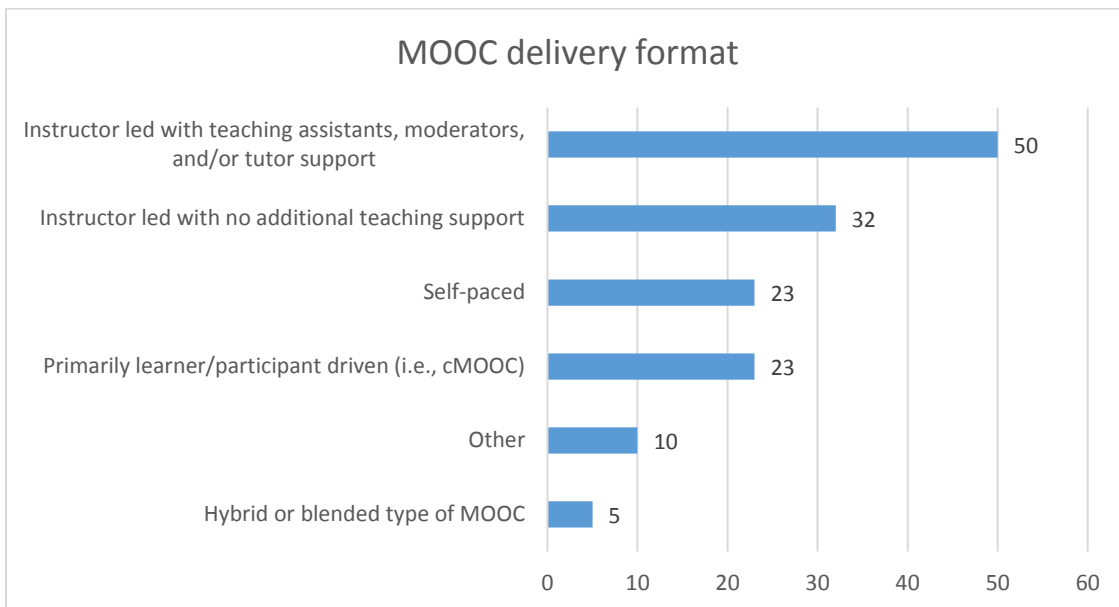


Figure 5. The format of the MOOC of the survey participants

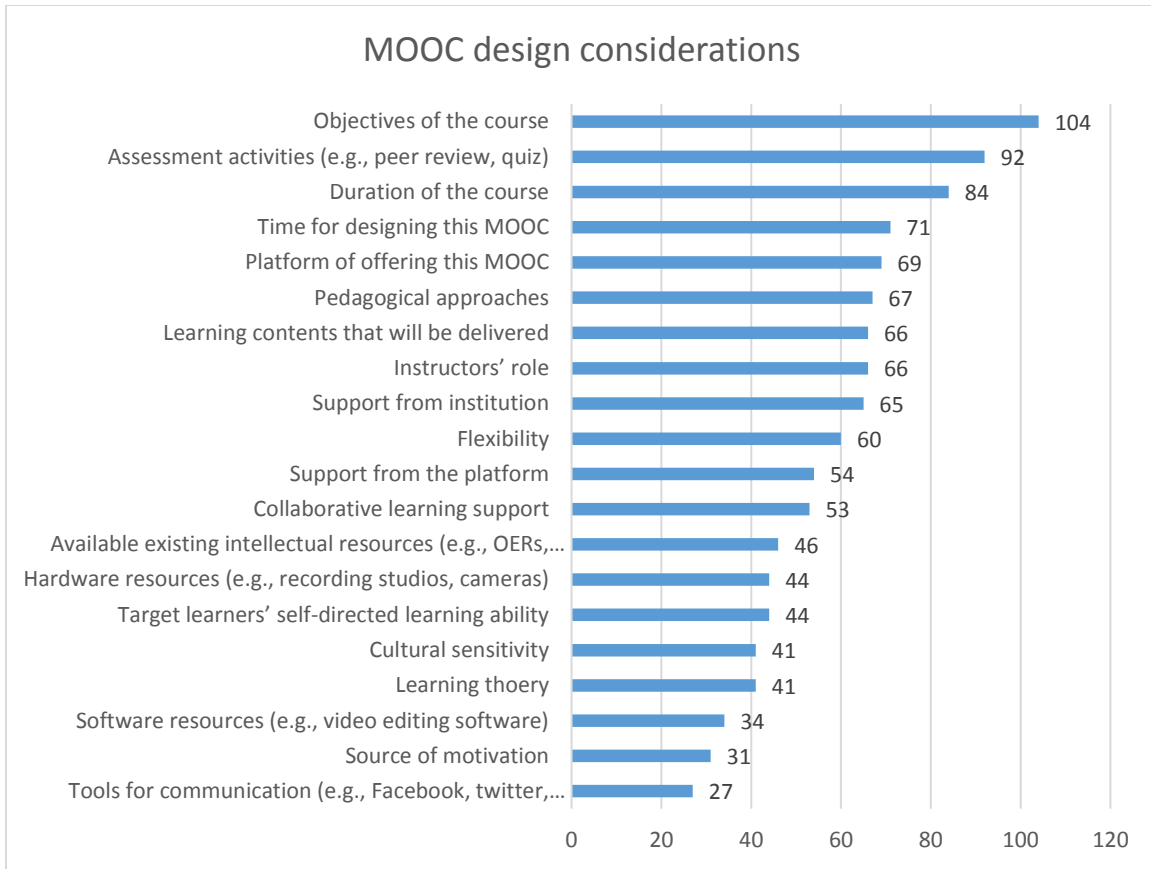


Figure 6. MOOC design considerations of the survey participants

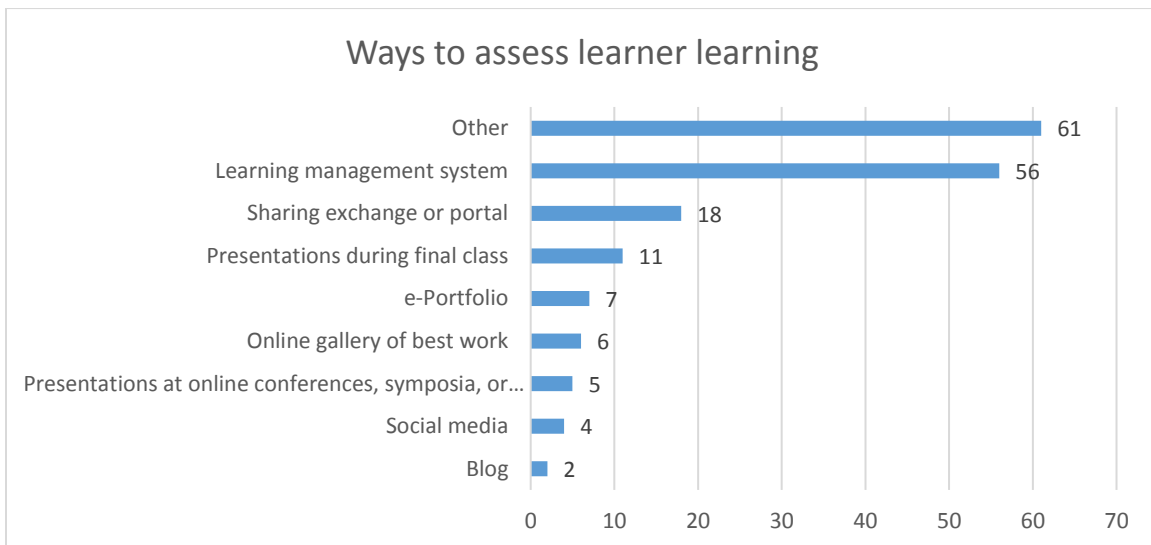


Figure 7. Ways MOOC instructors used to assess participant learning

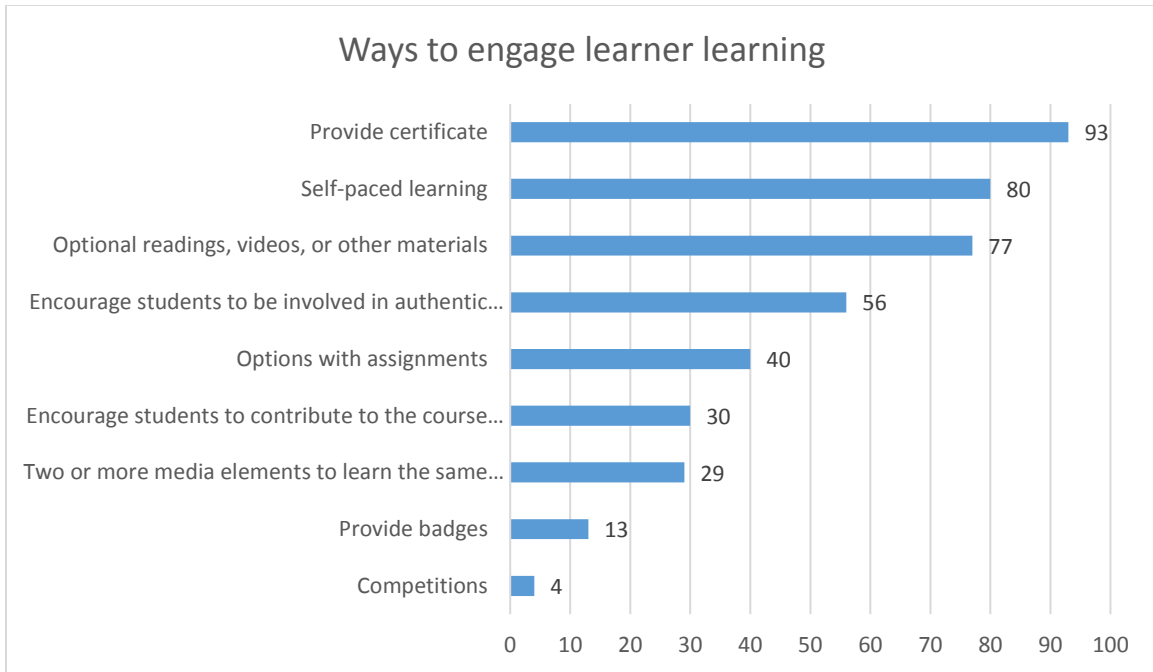


Figure 8. Ways MOOC instructors used to engage learners

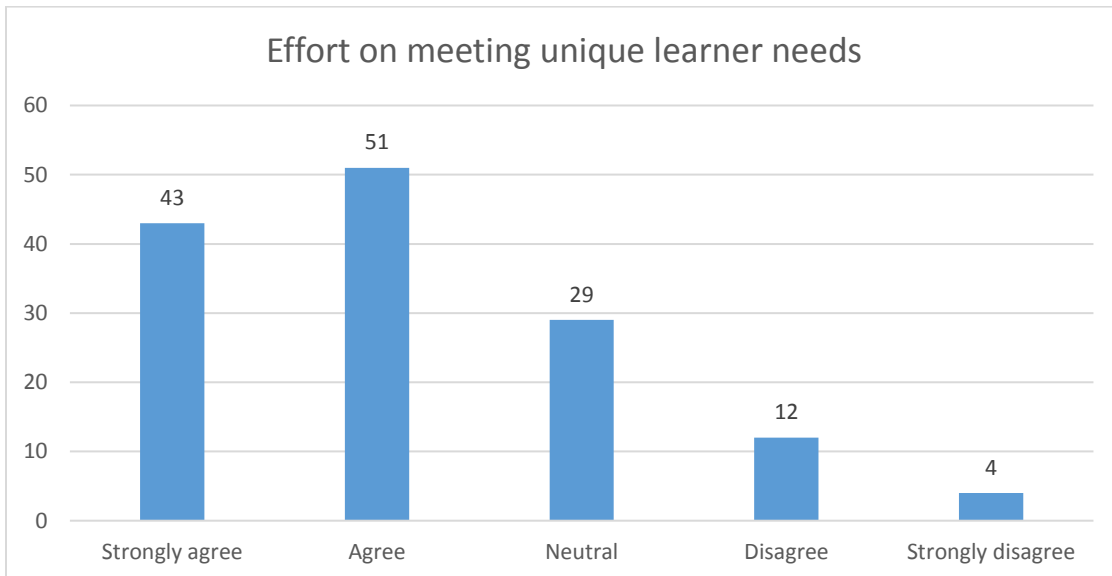


Figure 9. Effort expended by MOOC instructors to meet unique learner needs



Figure 10. Ways MOOC instructors used to address learner diverse needs

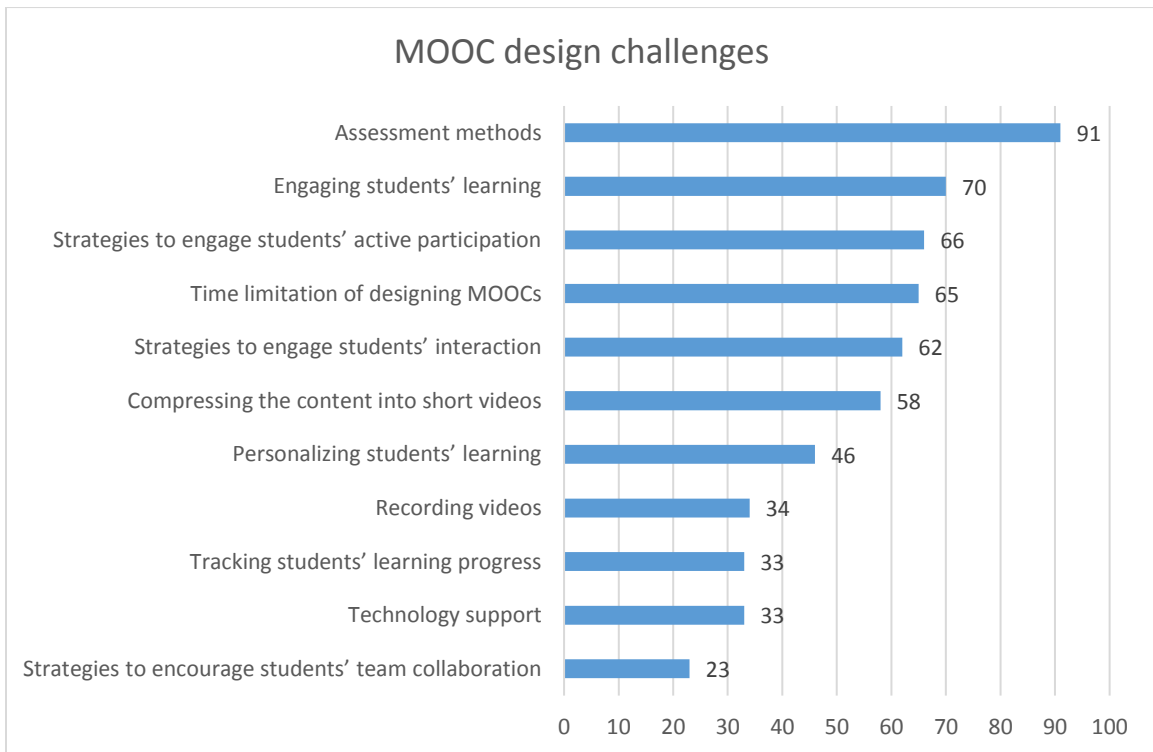


Figure 11. Design challenges that MOOC instructors faced