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Blended Learning - What Practitioners Can Learn From MOOCs

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Introduction

MOOCs offer a middle ground between organised classroom environments and fragmented information found on the internet. In this review, we aim to identify those aspects of MOOCs which can be used to inform blended learning methods in our own teaching. We focus on strategies used in MOOCs to teach and assess groups of large sizes as this can help reduce the workload of practitioners. Furthermore, we wish to enhance our students' learning experience using blended learning and increasing inclusive access for the increasing variety of learner. Therefore, this report will review content delivery in MOOCs, the pedagogical models used, how learner diversity and preference is catered for in MOOCs and finally student assessment.

Delivery of Content

According to Glance, Forsey, & Riley (2013), most MOOCs exhibit common defining characteristics: massive participation (5000-100,000); online delivery and open access. There are three broad types; xMOOCs, cMOOCs and quasi-MOOCs (Haggard, 2013).

Quasi-MOOCs offer web based tutorials as Open Educational Resources (OER) but lack course structures or examinations (Siemens, 2013). cMOOCs utilise resources such as blogs, learning communities and social media platforms to connect self-directed learners in a connectivist pedagogical model (Siemens, 2005) emphasising active peer-learning that is closely integrated with lecture content. (Conole, 2015; Siemens, 2013) These sources are combined through software that captures learning activity to give a structured overview of the course and learners' progression. All participants are considered teachers and learners (Hilgerch, 2014).

A key characteristic of xMOOCs is their delivery of rich interactive content to large numbers of students (Glance et al., 2013; Jordan, 2014). Scale is therefore central to their design and platforms are optimised for content delivery to mass audiences. As limited feedback is possible, automated testing and peer-assessment fulfills this role (Fischer, 2015; McAuley, Stewart, Cormier, & Siemens, 2010; Siemens, 2013).

xMOOCs are characterised by a 'super professor' pedagogical model (Siemens, 2013) adopting a behaviourist approach to learning where knowledge is acquired through repetition and testing (Sims, 2008), with video lectures delivered to very large classes. These video lectures are asynchronous; allowing pausing, rewinding and speed adjustment. Students can pace their learning facilitating a range of learning preferences, and content is

available as an OER (Atkins, Brown, & Hammond, 2007; Baepler, Walker, & Driessen, 2014/9). Video lectures are broken into short segments optimised for maximum attention and are connected to multiple choice question (MCQ) modules for self-testing which Glance et al. (2013) claim enhances both retrieval and mastery learning. Courses are modular and can be configured from standard components to meet specific learning needs. The extent to which peer-learning can be achieved with xMOOC models is disputed by MOOC pioneers like George Siemens who argues that they can replicate and reinforce traditional pedagogical models online (Siemens, 2012). Others, however, argue that the advantages of interactive media and peer collaboration afforded by MOOCs can foster "associative, constructivist, situative and connectivist" pedagogical approaches with improvements in learning outcomes (Conole, 2015).

These approaches are not limited to MOOCs, platforms such as Google Classroom allow for small scale variants that build on MOOCs' modular structure for targeted content delivery. This suggests that there is scope to build on the content-delivery innovation of MOOCs to incorporate blended learning into our practices.

Pedagogical Models

In order to assess the suitability of MOOCs for use in our own practice, a number of the pedagogical foundations that underpin MOOCs are discussed. Glance et al. (2013) outline the pedagogical approaches that are typically adopted as; self-directed learning, retrieval learning, mastery learning, peer assessment, self-assessment, constructive feedback, short lectures and online forums. These approaches can be seen to have a sound pedagogical basis (Boud & Falchikov, 1989; Mills, 1953).

Self-directed learning appears to have a strong impact on student engagement, for example, Morrison (2013) provides an assessment of two similar Education MOOCs she enrolled in. She proposes that the reasons why one, she believed, failed and the other succeeded was based on the different teaching philosophies of instructors and divergent beliefs on learning methods. One course was instructor-centred, linear in nature and constructed of prescribed content. The other was student-centred, with the learner in control of participation and assessment and was deemed more successful. The literature suggests that this approach can ensure that students reach an understanding of the material before moving to the next topic, thus enabling mastery learning. (Glance et al., 2013) This is in contrast to the conventional lecture style where each student moves through the material at the same pace. Bloom(1984) argued that mastery learning could result in an improvement of one standard deviation from the conventional group. There is discussion for and against the use of retrieval learning (Glance et al., 2013) through MCQs within the literature. (Agarwal, Bain, & Chamberlain, 2012) argue that short video followed by MCQs provides the opportunity for retrieval learning that improves long term retention over simply attending a class and completing homework. However, it could be argued that this method only improves surface learning.

Learner Diversity

The pedagogic approach in MOOCs is influenced by factors including: learner needs, preferences for learning styles and learner skill sets (language, digital literacy etc.). Their online nature invites participation from people with disabilities, wide range of ages and non-English speakers (Sanchez-Gordon & Luján-Mora, 2016a; Smith, Caldwell, & Richards, 2016).

Almost one-fifth of the world population has a disability (Sanchez-Gordon & Luján-Mora, 2016b) many MOOC platforms have adopted Web Accessibility Initiative (WAI) (W3C, 2016) to make content accessible to learners with disabilities. While WAI applies to web content, many authors stress the importance of also making other formats, Word, PDF etc., accessible (Robles, González, Gaona, & Rodríguez, 2016; Sánchez Gordón & Luján Mora, 2015) through the adoption of these standards.

Some authors suggest that students with dyslexia can benefit from adaptive teaching platforms such as MOOCs (Alsobhi, Khan, & Rahanu, 2015) where the content format can be selected based on learner preference (see section 1.5) and the adoption of guidelines, such as "A Guide to Quality in Online Learning" (Uvalic-Trumbic & Danile, 2013), which can be applied beyond online learning platforms.

Chung (2015) discusses how non-English speaking learners were likely to adopt complex strategies to guide learning on MOOCs, which suggests they can be supported through; clear learning outcomes and deliverables, forums and wikis and easy contact methods for tutors. Communities of learning have emerged from many MOOCs with people meeting in-person to translate content and teach their peers. These examples show how constructivist learning can develop around our courses if supported by social collaboration tools (Godwin-Jones, 2014; Talavera-Franco, 2016).

Increased life expectancy is expected to cause growth in the number of older students. MOOCs are ideal examples of cost effective lifelong learning, mental stimulation and social engagement (Sanchez-Gordon & Lujan-Mora, 2013).

Providing for Different Learning Preferences

Usually MOOCs are perceived as enforcing a linear structure, however, research suggests that a large number of students do not engage in this way (Guo & Reinecke, 2014; Littlejohn, Hood, Milligan, & Mustain, 2016). Students have been shown to perform frequent backjumps, often using assessment questions as a guide (Hood, Littlejohn, & Milligan, 2015). Typically younger students and those who are using the MOOC as their sole or primary source of information on the topic (i.e. those not practising the topic in their work or education) tend to follow a linear path to learning in MOOCs (Hood et al., 2015; Littlejohn et al., 2016). Hood et al. (2015) suggest connecting the learning occurring in MOOCs to 'real-world' contexts and students lives to deepen their learning.

As open learning environments target a massive number of people, facilitating the variability of learners' needs and preferences is crucial (Fasihuddin, Skinner, & Athauda, 2014). Much research has been conducted which attempts to categorize different learner style theories. Coffield et al. (2004) identified 70 such theories. There is much debate related to the validity of their use (Coffield et al., 2004; Truong, 2016/2). However, there is a recognition of the need to personalise the

online learning environment in MOOCs with a view to catering to diverse student groups (Lerís, Sein-Echaluce, Hernández, & Bueno, 2016) and it tends to be agreed that the provision of information in multiple forms can benefit all students (Murphy Paul, 2012). One method of facilitating this is by allowing the student to choose their own learning path by providing a large amount of alternative material and assessment types through different online media. This relatively static interface can create an overabundance of material which can cause cognitive overload (Wolf, 2002) and confuse students who find it difficult to identify what methods would work best for them (Carver, Howard, & Lane, 1999). Only a few examples exist of web-based courses or MOOCs which can adapt to learner preference (Carver et al., 1999; Gray & Palmer, 2001). The "Arthur" system (Gilbert & Han, 1999) for example, presents course concepts through different delivery methods which are adapted depending on the student's evaluation after each task. Adaptive models are more intricate and time consuming to create. Many make the assumption that learning preference is unchanging, which is a much criticised idea (Akbulut & Cardak, 2012) and is usually determined by questionnaire (Martin & Paredes Barragán, 2004; Paredes & Rodriguez, 2003). However, preference can be determined in a dynamic process by tracing student navigation (Abdullah, 2015). Common practices for improving adaptability in MOOC research have been identified by (Lerís et al., 2016) as six indicators and are presented as successful practices, however, it must be noted that much of the research is case-specific.

Assessment

MOOCs offer challenges and opportunities for assessment. Difficulties relate to design and grading of appropriate assessments for large student numbers, delivery of feedback and awarding of credit for MOOC participation. For some subjects, MCQs can be used to evaluate learning. However, it has been argued that such assessments only gauge surface learning (K. Scouller, 1998; K. M. Scouller & Prosser, 1994; Tang, 1994). If credit is to be given, student identity must be verified to avoid fraud (Aceves & Aceves, 2009)).

However, data analytics can provide a tailored, personalised MOOC experience for individual learners (Thille et al., 2014). Analysis of learner data in an interactive online learning environment allows for formulation of feedback–oriented,multi-faceted tasks.

Many assessment strategies have been used in MOOCs, however, this review focuses on the use of peer assessment. Topping (2009, pp. 20–21) defined peer assessment as "an arrangement for learners to consider and specify the level, value, or quality of a product or performance of other equal-status learners". The use of peer assessment in a MOOC was investigated by Luo, Robinson, & Park (2014). The results showed that the inter-rater reliability of peer grading scores assigned by individual students was found to be low, when compared to instructor grading. However, peer grading reliability was greatly improved when each assignment was assessed by 5 different students and all five scores averaged to create a composite score. The researchers also compared the use of a mean score versus median score. They found that mean-based grading score was slightly better for assessing the MOOC. Students' attitude towards the use of peer assessment was very positive with 63% of respondents agreeing that the peer grading activity benefited their learning experience due to enhanced learner engagement. 72% agreed that the use of peer evaluation promoted higher level thinking.

In order to improve the reliability of peer assessment, the Calibrated Peer Review™ system was developed at the University of California Los Angeles. In this approach, assessor accuracy is initially evaluated during a calibration process. Assessor accuracy is determined by examining how close the peer rater's marking of 3 standard essays comes to the instructor's mark of the same work.The more accurate the rater, the more weight is given to his/her grading of peer performance. The performance score for each student submission is the weighted mean of peer judgment scores.

The use of CPR™ for the development of students' scientific writing skills was highlighted in a study by Hartberg et al (2008). The results showed that students who received feedback on scientific writing assignments via CPR subsequently showed improved abstract writing ability compared to a group of students who only received feedback from a Teaching Assistant.

Conclusion

There are several features of MOOCs that can inform blended learning approaches. MOOCs' adoption of modern web standards makes accessing content easier than traditional LMS such as Blackboard with the look and feel more closely resembling that of popular social media platforms. The flexibility, strong pedagogical model and scalability of MOOCs can provide benefits for our own blended learning. However, effort must be devoted to the design of online learning environments to ensure that they cater to an audience varying in age, learning preference, language and learning needs. Furthermore, the incorporation of assessments into blended learning must accommodate the needs of a diverse student body, as well as promoting deep learning. In conclusion, the application of the lessons learned from the design and delivery of MOOCs can allow us to innovate within our own teaching and enhance the learning of our students. Variability between students can be provided for through careful consideration of the inclusivity and adaptability of the online environment, materials and assessment methods.

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