Massive Open Online Courses and Integrating Open Source Technology and Open Access Literature Into Technology–Based Degrees

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INTRODUCTION

The purpose of this chapter is to (1) understand MOOCS, massive online open courses, and differentiate MOOCS from other like learning and training methodologies, (2) comprehend the manner in that MOOCS can be utilized, as well as the (3) lasting impacts of MOOCS on learning whether in academics or the corporate environment. MOOCs are aimed at large scale participation in online education (Bud, Smith, & Reisman, 2015). This chapter will identify for educators, administrators, and practitioners the staggering awareness of the outcomes of this learning modality. MOOCs are continuing to change the way individuals receive education and learn. One idea of MOOCs is that learners may learn through collective education using what is believed to be a form of experimentation wrapped in andragogy, adult learning, andragogy. Education through Knowles' adult learning, offers the notion of learners gaining knowledge and understanding through (a) self-directedness, (b) need to know, (c) use of experience in learning, (d) readiness to learn, (e) orientation to learning, and (f) internal moti-vation (Knowles, 1979; Taylor & Kroth, 2009). Another view is that MOOCs could be the answer to the economic concerns faced by institutions of higher learning, the push to increase learner enrollment, and the drive to enhance graduation completion rates (Ng'ambi & Bozalek, 2015). Administrators, educators, and practitioners are faced with the increased popularity of MOOCs. The popularities of MOOCs include the positives as well as the concerns: their impersonal nature, numerous students enrolled into an individual section of a MOOC course, instructors serving as facilitators, as well as there being no instruc-tors assigned to courses. MOOCs, post-date open courseware which was on the increase in 1990s and the sharing of courseware online. Specifically, open courseware stems from face-to-face instruc-tions wherein instructors share aspects of their courses on the Internet which may be reading lists, assignments, recorded videos, audio lectures, or syllabi. One of the understood top aspects regard-ing MOOCs is that these courses fulfil knowledge gaps for learners. MOOCs propose for the learn-ers the alternative of completing quality courses without a financial obligation. Some MOOCs

courses, like Cousera, offer certificates. With this said MOOCS offer inexpensive avenues to add certificates to learners' resumes and therefore ways to drive personal accomplishments. MOOCs have maintained a large following of users. They draw attention and remain the element learners need to study and become educated outside of the traditional classroom.

This chapter will delve into key significant areas. First, the researchers will gain understanding regarding the development of a method in which Open Source Software (OSS), open source technologies, and open access literature can be incorporated to strengthen the MOOC environment. Second, readers will garner comprehension of how to strengthen the MOOC environment and therefore increase retention in addition to increasing enrollment in higher education. Third, the lasting impacts of MOOCs will be described, mainly as the impacts relate to STEM, Science, Technology, Engineering, and Mathematics and how such programs are entering the online space. Through this chapter, educators and administrators will grasp an increased interpretation of the technologies that have influenced learning and development. Administrators and Practitioners will learn meaningful solutions about open technology solutions so that as-is and to-be MOOCs can be improved with minimal cost. Further readers, researchers, administrators, and practitioners will learn how to infuse MOOCs learning and training initiatives to ensure best outcomes in the academic and e business world.

BACKGROUND

MOOCs is another form of distance education and learning community; the term originated in 2008 by David Cornier and senior research fellow Bryan Alexander (Martin, 2010). At that time, MOOCs described a course entitled *Connectivism and Connective Knowledge* (Pence, 2012). According to Caulfield, Collier, and Halawa (2013), MOOCs stem from the category of online connected learning communities. MOOCs are representative of Siemens' and Downes' connectivist learning theory, which provides that learning occur through connections within networks (Pence, 2012). The model uses a network with nodes and associations to explain learning (Siemens, 2013). The name MOOC was derived because (a.) MOOCs are collaborative with the appearance of experimentation, (b.) the courses move along numerous paths, and (c.) MOOCs necessitate participation in "Massively Multiplayer Online Game (MMOG)" (Pence, 2012, p. 27).

MOOCs, a recent innovation in the distance education field, were labeled as disruptive innovation (Christensen, 1997). According to Flynn (2013), MOOCs describe the varied kinds of changes in an evolving business education environment. The concept bracing MOOCs began in the 1960s; however, this approach to distance education re-ignites because of the digital education age (Flynn, 2013). As posited by Ta'eed (2012), Khan Academy was the first to house the free lectures. The Bill Gates Foundation and Google supported Khan Academy, a non-profit, with substantial backing in 2006. Today Khan Academy has over 3000 short video lectures, which were stated to have over 160 million hits (Severns, 2014; Ta'eed, 2012).

Understanding MOOCs and their relevance is important as MOOCs meaningfully progressed online distance education in past years (Rodriguez, 2012). Standing as an online distance educational model, MOOCs, are supported by colleges and universities; therefore, the need exist for faculty to understand and augment their knowledge regarding MOOCs' past, current and future trends. MOOCS have several prescribed frameworks: cognitive-behaviorist, connectivist social and constructivist (Rodriguez, 2012), connectivism (Pence, 2012), constructivist, connectivist experiential, and social structure, (Koutropoulos et al., 2012). The postulations of these researchers are that MOOCs were formed by technologies

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