Fad or Future: The Advantages and Challenges of Massive Open Online Courses (MOOCs)

by

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Abstract

Technology and globalization have increased accessibility to higher education. However, with the increased number of opportunities come uncertainties. In recent years, the concept of online or distance learning has expanded to include a growing number of Massive Online Open Courses (MOOCs), free higher education courses open for enrollment for any Internet user. MOOCs are a recent trend in distance learning promoted by several prestigious universities. The research examines the rise of MOOCs with a review of the history, characteristics, advantages, and challenges of the program. The authors discuss how MOOCs enhance accessibility, student engagement, and experiences for lifelong learning. In addition, challenges for learners and institutions are examined for individual instruction, student performance assessment, and long-term administration, and oversight of these types of courses.

Introduction

Massive Open Online Courses (MOOCs) are free and open online courses offered by some of the country's leading universities and institutions including Harvard, Massachusetts Institute of Technology (MIT), and Stanford. In recent years, there have been a growing number of MOOCs on the Internet. This paper introduces a brief history of MOOCs and their characteristic massiveness, openness, and connectivism. Accessibility, student engagement, and experiences for lifelong learning are recognized as the advantages of MOOCs. Additionally,

challenges are discussed regarding individual instruction, student performance assessment, and long-term administration and oversight.

History

For many, the concept of MOOCs is not well understood. What originated as open online courses (OOCs) using web technologies to present an open education experience suddenly morphed into an experience for the masses when 2,200 people signed up for Siemens and Downes' Connectivism and Connective Knowledge course in 2008 [CCK08] (Fini, 2009; Rodriguez, 2012). Shortly thereafter companies such as Coursera, which launched in April 2012, began coordinating a growing number of MOOC offerings.

Individuals involved in the early development of MOOCs as an instructional strategy included Siemens and Downes' CCK08; the University of Illinois' not-for-credit course with 2,700 participants in 2011; and Thrun and Norvig's Artificial Intelligence course (CS221) with 160,000 students enrolled from 190 countries (Carr, 2012; Rodriguez, 2012). As a result of his experience, Thrun launched Udacity in 2012, a for-profit company providing alternative lifelong learning options primarily in computer science and math. In May 2012, Harvard and MIT launched the non-profit, edX, with the University of California at Berkeley joining soon after. They were clear that their agenda was to explore innovative ways to improve classroom education, not to replace it (Kolowich, 2013a). Also in 2012, the for-profit company Coursera was founded by Stanford professors Koller and Ng (Carr, 2012). Coursera partners with leading universities to provide educational access to all.

Some suggest that the MOOC revolution is the past repeating itself, although with a very different delivery model. Carr (2012) reminded readers of the radical change in higher education in the early 1900s. Essentially, access to higher education was provided to anyone with a

mailbox through correspondence courses. However, academic rigor and course completion remained a major concern and a number of educators questioned the instructional quality.

Characteristics

MOOCs are built on the characteristics of massiveness, openness, and a connectivist philosophy. McAuley, Stewart, Siemens, and Cormier (2010) explained that MOOCs use strategies similar to social networking to connect the masses but with the added benefits of subject matter experts to facilitate the content and to coordinate a vast array of free, online materials. Students also have the opportunity to engage with others throughout the world with some organizing sub-groups specific to their learning goals and interests.

Massiveness. MOOCs easily accommodate large numbers of students. More than a million people in the world have taken MOOCs (Carr, 2012). "From a pragmatic perspective, MOOCs provide access to large numbers of people who might otherwise be excluded for reasons ranging from time, to geographic location, to formal prerequisites, to financial hardship" (McAuley et al., 2010, p. 6). The artificial intelligence course developed and conducted by Stanford faculty Sebastian Thrun and Peter Norvig is an example of massiveness as 160,000 enrolled in the course (Martin, 2012).

Openness. Openness involves several key concepts: software, registration, curriculum, and assessment; communication including interaction, collaboration, and sharing; and learning environments (Rodriguez, 2012). Rodriguez (2012) further discussed that

> The software used is open-source, registration is open to anyone, and the curriculum is open (perhaps loosely structured and it can even change as the course evolves), the sources of information are open, the assessment processes (if they exist) are open, and the learners are open to a range of different learning environments. (p. 4)

In sum, McAuley et al. (2010) reiterated the concept of openness as any learner can take a MOOC and, as are result, exclusion from higher education opportunities is not an issue.

Connectivism. MOOCs offer an emerging online teaching methodology inspired by a connectivist philosophy. The MOOC format is commonly referred to as c_MOOCs (Connectivist Massive Open Online Courses). Connectivism values autonomy, diversity, openness, and interactivity (Rodriguez, 2012). Connectivism teaching strategies allow an instructor to assume the role of facilitator with learners actively interacting with other students. It is not a knowledge transfer from instructor to learner in a single learning environment (Kop, 2011). "Most significantly, MOOCs build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests" (McAuley et al., 2010, p.10). Therefore, active engagement and interaction are key MOOC instructional methods.

Advantages

Although much controversy surrounds the idea of MOOCs, studies have cited several advantages. Some of the areas in which MOOCs have been cited as most beneficial include increased options for accessibility, increased potential for student engagement, and expanded lifelong learning opportunities (Carr, 2012; Duderstadt, 2012).

Accessibility

Participants and instructors note benefits from the enhanced accessibility that MOOCs offer (de Waard, 2011). MOOCs, typically low cost or free, create irresistible appeal for recruiting potential participants. The online format of MOOCs offers access and flexibility and eliminates the need for prerequisites. Leber (2013) stated that, "as online education platforms like Coursera, edX, and Udacity burst onto the scene over the past year, backers have talked up

their potential to democratize higher education in the countries that have had the least access" (para 1). In addition, MOOCs have not been limited to college students, and/or professionals, but even younger students can participate in the MOOC experience.

Student Engagement

MOOCs are designed to enhance student engagement as improving student outcomes is one of the primary goals. According to Trowler and Trowler (2010),

> Student engagement is the investment of time, effort, and other relevant resources by both students and their institutions intended to optimize the student experience and enhance the learning outcomes and development of students, and the performance and reputation of the institution. (p. 2)

Student and instructor participation, motivation, instructional method, and delivery are all important aspects necessary to create a MOOC environment conducive to learning.

MOOC educators play a vital role in enhancing student engagement. Rodriguez (2012) highlighted eight important roles identified from an AI-Stanford course that included: amplifying, curating, way (direction) finding, aggregating, filtering, modeling, and staying current. Student engagement can also be enhanced as instructors recognize the learning styles of students and adapt their teaching strategies accordingly. Understanding the responsibilities of students, facilitators, and institution administrators is essential to ensuring the enhancement of student engagement in MOOCs now and in the future.

Lifelong Learning Experiences

According to de Waard (2011), "lifelong learning skills will be improved, for participating in a MOOC forces you to think about your own learning and knowledge absorption" (p. 2). MOOCs allow participants to pursue a particular interest or to continue their

professional development. Beyond MOOCs conventional lifelong learning experiences, educational opportunities exist for underprivileged populations as a way to encourage lifelong learning. In addition, employers can utilize MOOCs to keep employees abreast of the competitive labor market throughout their lifetime and in a way that is cost-effective.

Challenges

Although some educators recognize the advantages of MOOCs, several challenges exist. Among the most common challenges are individual instruction, student performance assessment, and long-term administration and oversight.

Individual Instruction

MOOCs require course delivery to a large number of learners. They attract a wide variety of students with different learning styles from all around the world. It is a challenge for instructors to engage students, maintain their interest in the course, and tailor the learning environment to fit the need of each student.

A solution proposed by Carr (2012) is machine learning. Machine learning utilizes computers to collect and analyze data from a learning system to test hypotheses about how people learn (Carr, 2012). Carr discussed that, during the course data collection process, every variable is tracked such as a student's pause during a video, increased feedback speed, response to quiz questions, revised assignments, and forum discussion. Collected data is then used to analyze student behavior and test how people learn. In this way, an instructor could tailor the learning environment to fit each student's learning style and needs.

However, some researchers disagree with the use of machine learning. They believe that a critical component of education is the interaction between students and teachers. Machines

cannot simulate the interaction (Carr, 2012). Therefore, there is a need for research in the field to test the correlation between interaction and machine simulation.

Student Performance Assessment

One of the biggest challenges of MOOCs is the assessment of student performance (Rodriguez, 2012). Cheating presents a major challenge of online education (Carr, 2012). How to validate original work to prevent or detect plagiarism is one of the widely discussed challenges in online education (Cooper & Sahami, 2013). Some solutions for the challenge are being proposed by institutions that offer MOOCs. For example, Udacity and edX use test centers for their online courses. However, the cost to students presents a barrier. Coursera attempted to use plagiarism-detection software in detecting cheating. Also, machine learning has been proposed to identify cheating by the analysis of learner behavior.

Long-Term Administration and Oversight

Those on the front lines of MOOC development and implementation warn that, although MOOC's might be open and free to participants, the costs to institutions can be significant. For example, course development assistance through edX can reach upwards of $250,000 per course with an additional $50,000 fee each time the course is offered (Kolowich, 2013b). For instructors who develop their own courses, human resource needs include course development (typically 100 hours) and course management (8-10 hours per week) in addition to existing professorial duties.

Some institutions have rejected the MOOC concept not because of resources, financial or human, but because of philosophical differences citing that MOOCs are contradictory to the overarching institutional mission. Amherst College was one that recently decided, by faculty vote, to decline an invitation to join edX. Although Amherst faculty were not opposed to

exploring innovative teaching or delivery methods, the idea of joining a consortium of institutions through edX was not appealing (Kolowich, 2013b).

Other institutions remain cautious and are waiting for the hype to subside. For some presidents and chancellors, "MOOCs are a perfect storm of hype, hyperbole, and hysteria-and yet many have plunged headlong into them without a real clear sense of why or how MOOCs can help more students succeed" (Greenstein, 2013, para. 5). Government and policymakers are looking at MOOCs through the lens of affordability and accessibility. Faculty are raising questions about the influence of MOOCs on academic freedom, relevancy to institutional mission, and instructional quality.

Conclusion and Recommendations

The development of technologies in distance education continues to influence the context of education and learning (Bouchard, 2011). MOOCs bring a new perspective to traditional education but are still in the infancy stage. It seems that institutions, as a whole, might be apprehensive about MOOCs as they relate to access, affordability, and student success. For those who are proponents of the MOOC, increasing numbers might be leery about signing over long-term administration and oversight to companies such as edX, Udacity, or Coursera. However, in a time when higher education is being criticized for low productivity, increasing costs, and inefficient use of technology (Levine, 2013), MOOCs provide viable alternatives of high productivity, low cost (or free), and utilization of leading edge technology. The challenge is to find common ground that not only improves access and affordability but maintains academic rigor and ensures student success.

Although educators and administrators might proceed with caution, it would be prudent to take a closer look at the MOOC concept to weigh the pros and cons and to recognize the

potential value. Ways in which MOOC strategies might improve accessibility, student engagement, and lifelong learning opportunities should continue to be explored. MOOCs also present major challenges related to instruction, assessment, and long-term administration and oversight. Further research and analysis regarding these challenges should be conducted to determine what solutions might exist. Only time will tell if MOOCs are a passing fad or predict the future of higher education.

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