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Massive Open Online Courses

Introduction

Traditional colleges and universities are facing a number of issues, including increasing number of students for the degree course, insufficient physical infrastructure, delay in admission, difficulty to adopt CBCS, inadequate faculty, increasing cost of education, reduced state for recruitment of faculty, and increasing competition from for-profit institutions. While these concerns are being addressed in various ways by different institutions, a relatively new technology — Massive Open Online Courses, or MOOCs— is increasingly being discussed as, an option that could deliver higher education materials to hundreds of millions of people at potentially lower costs.

Historical Background

In 2001, the Massachusetts Institute of Technology (MIT) launched its Open Course Ware (OCW), with the aim of publishing materials from all its courses permanently on the open Web. Since then many other established universities have joined the movement. Massive Open Online Courses have their roots in the free online versions of existing courses taught by a number of well-known universities. The term MOOC was coined in 2008 by Dave Cormier of the University of Prince Edward Island in response to the course Connectivism and Connective Knowledge. One of the first of the MOOCs, "Connectivism and Connective Knowledge," was offered in 2008 by Stephen Downes and George Siemens at the University of Manitoba (Fini, 2009). This course attracted numerous adults and various informal learners and utilized a large number of technological tools proposed by the facilitators or suggested by participants, including chat, mailing lists, discussion forums, Wikis, a Web conferencing system, personal blogs, and numerous other tools. "Introduction to Artificial Intelligence"

was another course in this area, offered by Stanford in 2011 (Carey, 2012). This online, non-credit course was offered free to anyone, with an original expected enrollment of 10,000, although it ended up enrolling a total of 1,60,000 students. Utilizing a course Web home and a customized learning management system, the course included lectures, homework, and assessments. While many students did not finish the course, some performed as well on the assignments and exams as the students taking the traditional campus-based course. The Massachusetts Institute of Technology was another of the institutions offering these early MOOC- like courses at approximately the same time (DiSalvio, 2011). Their first online course in this area, "Circuits and Electronics," was offered in 2012, with 1,55,000 people registered for the course. Of this original number, approximately 23,000 tried the first problem set, 9,000 passed the midterm, and 7,157 passed the full course. According to The New York Times, 2012 became "the year of the MOOC" as several well-financed providers, associated with top universities, emerged, including Coursera, Udacity, and edX (Pappano, 2012).

Many researchers and faculty have taken interest in MOOCs recognizing the potential to deliver education around the globe on an unprecedented scale; some of these are taking a research-oriented perspective and academic papers describing their research are starting to appear in the traditional media of publications. This paper presents a narrative review of the published MOOC literature.

Focus of the Review

This narrative review attempts to answer following questions: (1) what are the characteristics of MOOC ? (2) What are the types of MOOCs? (3) What are the benefits and challenges of MOOCs?

Research Method

This narrative review is a qualitative research. This review is based on publications related to MOOC. The researcher used Google Scholar and ERIC database to search for related literature. The researcher searched the ERIC database (http://eric.ed.gov) and Google Sholar service (http://scholar.google.com) for keywords "Massive Open Online Courses". The researcher used criteria like "full text availability", "published between 2013 and 2014" and "peer reviewed journals" to refine the resulting hundreds of articles. Initial search in Google scholar returned 6,700 articles, and when the searching result was refined by adding criteria of papers published between 2013 to 2014 and removing citation and patents, the number

decreased to 4,590. Initial search in ERIC database returned 131 publications, and when the searching result was refined by adding criteria of full text availability from ERIC, peer reviewed, and published in year 2014 the number decreased to 22. The researcher downloaded and read the publications related to the research questions from the top search result.

Discussion

MOOC Characteristics

A MOOC (massive open online course) is an online course with the option of free and open registration, a publicly shared curriculum, and open-ended outcomes (Chen, 2014). Following characteristics of MOOC are described by Wulf, Blohm, Leimeister & Brenner (2014); Chen (2014); Gaebel (2013); Siemens (2013).

Large number of participants (Massive): In contrast to traditional distance learning courses, MOOCs address an unlimited number of participants. Enrollments tend to be quite high. The scale of "massive" is somewhat relative. Early MOOCs had in the range of 2,000 students, but offerings by Coursera and Udacity have exceeded 1,00,000 registrants.

Open accessibility (Open): The most obvious feature of MOOC-based courses is their open availability to everyone with Internet access. Along these lines, individuals are free to join, create, interact, analyze, and reflect based on their learning needs, with students joining, participating, and withdrawing with great frequency. There are no, or very few, formal conditions for participation. The courses address a global target group. Specific previous knowledge is only required if the course is embedded in a degree program. Moreover, MOOCs are often free of charge or impose only low participation fees.

Digitization (Online): Courses are exclusively conducted via the Internet and thus are not location-dependent. Digitization comprises the learning material, the teaching process, social interaction of participants as well as their examination. Forum, live chat or hangouts, blogs are used to support collaborative learning.

Pedagogical concepts (Course): The learning content is structured according to a pedagogical concept. The teaching process and the development of knowledge follows pre-defined learning objectives. Elements of design may include course scheduling, a pre structuring of the learning content, the control of social learning interaction, as well as the execution of reviews of educational objectives and tests. The content is generally presented as short video lectures. Assessment includes peer assessment, quizzes and project assignments.

MOOCs have a set start and stop time. Even if MOOC archives are made available after the course, social interactions in forums and blogs occur during the set times of the course offering. While there are some areas of overlap and use of open education resources with MOOCs, the content is somewhat structured and sequenced, even when multiple sources of learning content are used.

Role of Faculty: As with traditional classroom based instruction, faculty members often both design and lead the courses for the students who are enrolled in the course. Faculty members in these courses serve as a coach or mentor in addition to guiding learners to embrace social media practices. With regard to instruction, MOOCs typically have somewhat limited student interaction, often including short videos of professors explaining course content, on-screen exercises and quizzes to provide reinforcement and keep students involved, and some form of social networking. While the instructional materials often include a variety of media types, the communication exchanges between the professor and the students are often minimal

Types of MOOC

MOOC models are evolving quickly. In their current configuration, they can be classified as xMOOCs, cMOOCs and quasi-MOOCs (Siemens, 2013; Liyanagunawardena, Adams, & Williams, 2013). cMOOCs and xMOOCs represent very different formats of massive open online courses. Their pedagogical foundations, the different way in which social interactions happen during the courses sets them apart (Rodriguez, 2013; Liyanagunawardena, Adams, & Williams, 2013).

xMOOCs: xMOOCs fall into the cognitive-behaviorist pedagogy category (Liyanagunawardena, Adams, & Williams, 2013). It takes a more traditional approach to learning, with videotaped lectures, online quizzes and weekly assignments. They follow the structure of existing educational practices (Rodriguez, 2013). The pedagogical model that underpins these courses is one of "teacher as expert" and "learner as knowledge consumer." Learning is primarily a process of the learner duplicating the knowledge structure set by the course designer and the instructor teaching the course. Weekly course topics are addressed through recorded lectures that range from 3 to 30 minutes in length (Siemens, 2013). In order to meet the challenges of large numbers of students, assignments are computer-graded in xMOOCs. Direct instructor feedback is not common, except in discussion forums where teaching assistants and the course instructor respond to student questions (Siemens, 2013;

Rodriguez, 2013). Major xMOOC providers are Coursera, Udacity, edX, Udemy (Chen, 2014).

cMOOCs: cMOOCs fall into the connectivist pedagogy category(Liyanagunawardena, Adams, & Williams, 2013). In cMOOCs the learner´s autonomy, peer-to-peer learning and social networking are emphasized (Rodriguez, 2013). In contrast with xMOOCs, cMOOCs are largely open in terms of the activities that learners can pursue related to the theme, with limited structure and weekly themes. As a consequence of increased learner control, numerous tools and technologies are used during the delivery of an open course. Each learner selects the technologies that he or she prefers to use. Course facilitators provide: an infrastructure for content and administrative details (in the form of a wiki or a Web page); a schedule for synchronous sessions involving guest speakers or live discussions; a means of communicating with participants and providing course updates (often handled through email and blogs); and starting points for learners to form connections with each other (Siemens, 2013).

quasi-MOOCs: quasi-MOOCs provide Web-based tutorials as OER(Open Educational Resources), such as those of the Khan Academy and MIT's OpenCourseWare (OCW). These are technically not courses. They consist of OER intended to support learning-specific tasks or they are treated as asynchronous learning resources that do not offer the social interaction of cMOOCs or the automated grading and tutorial-driven format of xMOOCs. These resources are loosely linked and are not packaged as a course (Siemens, 2013).

Benefits of MOOC

Reduce educational cost: MOOCs appear more cost-effective than online courses (Hollands & Tirthali, 2014). Through the systematic use of social interaction mechanisms, such as peer support or peer grading, value activities traditionally carried out by providers of educational services are systematically sourced to MOOC participants. Course participants contribute actively to reducing education costs by taking on subtasks of the teaching process, especially in the areas of support and evaluation (Wulf, Blohm, Leimeister & Brenner, 2014). MOOCs allows middle class families to offset their high college tuition rates (Chen, 2014).

Global audience: MOOCs is open to any person who has access to the Internet. It provides free online courses and makes higher education accessible to a global audience. Learners around the world can enroll in MOOCs without any cost. They can even take courses from top universities, as more elite higher education institutions provide MOOCs. They do not

need to go to campus or pay expensive tuition for taking courses from top ranking universities (Chen, 2014). Even in-class students can benefit from the online materials in MOOCs. In some MOOCs, in-class students and MOOC students take classes together. Some professors rearrange their courses to allow their students to complete the online lessons first and come to class later for interactive projects. Such an arrangement allows in-class students and MOOC students to interact with each other. The interaction is very helpful for improving learning effects (Chen, 2014).

Support lifelong learning: MOOCs is a great mechanism for lifelong learning, and users range from teenagers to retirees. Learners take MOOCs for the purpose of gaining an understanding of the subject matter, increasing social experience and intellectual stimulation, taking advantage of the convenience, overcoming barriers to traditional education options, and exploring online education. MOOC is the right learning mode for people looking for extra learning by maximizing their time. This allows self-motivated learners to craft their own educational path by accessing the knowledge, lectures, quizzes, homework, exams, and personalities of the best professors at the top universities in the world (Chen, 2014).

Challenges for MOOC

High dropout rate: MOOCs have poor completion rates in comparison with traditional university courses. The majority of MOOCs had completion rates of less than 10% (Liyanagunawardena, Adams, & Williams, 2013). However, dropouts in MOOCs may be driven by different factors than in traditional courses. Students taking a traditional course have a different level of commitment because of credit seeking, the motivation of paid tuition fees, and the need to take a course to fulfill degree requirements. Together, these factors are a type of hard commitment on the part of students. Failure to complete the course has implications for future study. Learners who take a MOOC may do so for a range of reasons beyond credit. The obligation for continuing a course is not driven by responsibility of completion, but for reasons such as personal interest or motivation (Siemens, 2013). Another reason for the high dropout rate in MOOCs might be the lack of an admission process. No admission process makes MOOCs open to anyone. Learners can register a MOOC regardless of their educational background. Without the admission process, it is difficult to determine whether a learner's education background meets the requirements of a course and whether a course is right for a learner. Because the selection process is missing at the beginning, a big number of learners can register for a MOOC. Once the course begins, it is very likely some

learners find the course is not what they want or their background does not allow them to catch up with the course (Chen, 2014).

Ineffective assessments: Conducting effective assessments in a MOOC is a big challenge so far. On one hand, as a type of asynchronous online learning, MOOCs inheres security risks on the Internet. On the other hand, the number of available effective assessment methods is limited. The development of technology makes diverse cheating methods available for online assessments. Methods of cheating with online assessments include using online communication and telecommunications, Internet surfing, copying and pasting from online sources, obtaining answer keys in an illegitimate way, taking the same assessment several times, and getting unauthorized assistance. Other means of cheating on online tests include someone other than the actual student taking the online test and copying answers from elsewhere (Chen, 2014). While MOOCs are often non-credit, cheating and plagiarism is a growing concern for university providers. These concerns require attention from open course providers in order for MOOCs to be considered for credit or transfer by universities (Siemens, 2013).

Recognition: Recognition for MOOCs and their accreditation is another area of debate. MOOCs run by educational technology companies such as Coursera and EdX provide the option to pay for certification. For example, Coursera offers proctored exams for a fee, which will earn (if successful) certification. On the other hand, most MOOCs offer badges for completion of either the full course or each unit. Some MOOC-offering institutions and/or instructors provide a Statement of Accomplishment for successful students. However, these generally do not carry college credits (Liyanagunawardena, Adams, & Williams, 2013).

Hardware and internet facility: In terms of hardware, MOOCs requires computers, headsets/speakers, microphones, and an Internet connection. Among the course contents, video lectures are the main components in MOOCs. Many course contents of MOOCs are delivered in video format via the Internet. To watch a high quality video, learners need broadband connections. However, not every learner has access to a fast Internet connection. Many MOOCs learners are in developing countries and have limited access to the Internet (Chen, 2014).

Conclusion

MOOCs have generated a high level of excitement as well as the investment of millions of dollars from investors and universities into companies such as Audacity, Coursera, and edX.

In addition, they have earned praise for bringing high-quality education to students who may not have access to higher education (e.g., those in remote places) as well as for bolstering teaching quality and productivity. In India, IIT-Bombay is working on providing a MOOC platform called SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds) for the educational institutes; MOOC can become a tool to be adopted by higher education institutes to overcome the challenges of higher education.

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