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FUTUROLOGY OF EDUCATION- MASSIVE OPEN ONLINE COURSES

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ABSTRACT

Massive open online courses (MOOCs) are a recent development in the area of e-learning and distance education that gains significant popularity among both students and educators. The unique feature of MOOC is providing education to public, at minimum level of cost at world scale. ***Massive open online course****s an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for students, professors, and teaching assistants. MOOCs often emphasized open access features, such as connectivism and open licensing of content, structure and learning goals, to promote the reuse and remixing of resources. Some MOOCs use closed licenses for their course materials while maintaining free access for students. Many MOOCs use video lectures, employing the old form of teaching using a new technology. The two basic approaches are: 1.Peer-review and group collaboration 2. Automated feedback through objective, online assessments, e.g. quizzes and exams. MOOCs emphasis modes of learning that include retrieval learning and mastery learning. Retrieval learning acts to enhance long-term memory of facts by prompting recall of information from short-term memory. In MOOCs, retrieval learning is enhanced through the practice of using frequent formative quizzes. Again there is evidence from multiple sources to support the notion that the use of tests and quizzes enhances learning over simply allowing students to listen or read content. This open education brings new opportunities for innovation in education system that will allow institutions and academics to explore new online learning models and innovative practices in teaching and learning.*

KEYWORDS: *xmooc, cmooc, openness, massiveness, connectivism*

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. An online phenomenon gathering momentum over the past two years or so, a

MOOC integrates the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources. Perhaps most importantly, however, a MOOC builds on the active engagement of several hundred to several thousand "students" who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. Although it may share in some of the conventions of an ordinary course, such as a predefined timeline and weekly topics for consideration, a MOOC generally carries no fees, no prerequisites other than Internet access and interest, no predefined expectations for participation, and no formal accreditation.

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.

TWO TYPES OF MOOCS

CMOOCs:-

Connectivism and Connective Knowledge was about — and based on — the learning theory of connectivism, developed by one of the instructors, George Siemens. His theory is based on the idea that learning happens within a network, where learners use digital platforms such as blogs, wikis, social media platforms to make connections with content, learning communities and other learners to create and construct knowledge. Within a cMOOC, learners are encouraged (though not required) to contribute actively, using these digital platforms. Participants' contributions in form of blog posts, tweets etc. are aggregated by course organizers and shared with all participants via daily email or newsletter. cMOOCs are also not typically sponsored or funded by higher education institutions but are organized by individuals with a passion for a specific content area. Organizers commit their time to create a framework for learning where participants from all over the world can connect share, contribute, collaborate to learn and expand their network professionally and personally. cMOOCs are also open and flexible, responsive to needs of its participants which can provide a tailored learning experience.

XMOOCs:-

The origins of xMOOCs go back to 2011, when Peter Norvig and Sebastian Thrun from the University of Stanford offered students the chance to enroll in their AI (Artificial Intelligence) course. To everyone's surprise, the total number of registered participants was an unprecedented (or massive) 160,000. Soon after AI concluded, Thrun set up Udacity, which was a MOOC platform focusing on technology and science. Then, Coursera opened, followed by edX. The latter is a joint venture between MIT and Harvard. To date, new platforms are being released, such as NovoEd from Stanford and Open2Study from Open Universities in Australia.

MOOCs delivered on these university style platforms are based on standard degree level course materials, and higher education teaching techniques and learning theories. For instance, normally, MOOCs are organized round quiz type examination methods and lectures. Moreover, typically, these courses do not feature content available on the internet away from the platform. The majority of content for the courses consist of prerecorded lectures, which are relayed in video format. This was why Downes invented acronyms (mentioned above) to distinguish between the two types of courses. xMOOCs are not superior or inferior to cMOOCs, they are just different. An xMOOC fits the requirements of many students searching for an academic course related to a certain interest.

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 an 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"In addition, MOOCs have not been limited to college students, and/or professionals, but even younger students can participate in the MOOC experience.

Improving Educational Outcomes:-

Motivating instructors to rethink pedagogy

- Course re-design
- "Chunking" lectures and interspersing questions
- Fine-tuning instructional materials
- Providing instant feedback
- Gamification and badging to increase motivation
- Outreach to participants to encourage persistence
- Adaptive learning/personalization/mastery-based learning
- Using MOOCs in K-12 to prepare students for college

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.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.

Adaptive learning/personalization/ mastery-based learning:-

One of the pedagogical attractions of online learning is the possibility of providing adaptive learning experiences that is, providing a learning trajectory for each individual student that responds to ongoing assessment of how that student is performing. For example, if a student is struggling with a concept, the learning platform may direct him to a prior learning experience and only return to the original trajectory once he demonstrates a grasp of the prior concept. Students that master the targeted skills and content quickly can complete the course at their own pace without being held to a "seat-time" model of learning. Stephen Laster, Chief Digital Officer at McGraw-Hill Education, asserted that particularly for MOOCs which are open access, there must be recognition that participants will begin the course in various states of readiness and bring with them many different learning styles. He sees value in providing a preassessment that determines the prior knowledge and skills of participants. Such an assessment could be used to advise participants whether they are ready to take the course or to direct students to more scaffolded material. By allowing more accurate targeting of the course to participants, the completion rates may improve. Petersen at edX indicated that a few MOOC developers are indeed using preassessments for learners to judge for themselves their skill level relative to the content being presented. But she added that, for now, it is up to the learners to find their way through the materials; it is not the system that responds to a learner's performance and skips him ahead or re-directs him to polish a skill.

Lifelong Learning Experiences:-

According to de Ward (2011), "lifelong learning skills will be improved, for participating in a MOOC forces you to think about your own learning and knowledge absorption". 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. Courses attempted

to use plagiarism-detection software in detecting cheating. Also, machine learning has been proposed to identify cheating by the analysis of learner behavior.

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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