MOOCs: A new Pedagogy of Online Digital Learning

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ABSTRACT

Massive Open Online Courses (MOOCs) are free and open online courses offered by some of the world's leading universities and institutions including Harvard, Massachusetts Institute of Technology (MIT), and Stanford etc. When MOOC were announced in 2011, it came with a lot of promise – anyone from around the world right from an average villager to a college dropout could take the courses, and gain knowledge and employment.

In recent years, there have been a growing number of MOOCs on the Internet. MOOCs are built on the characteristics of massiveness, openness, and a connectivist philosophy. This paper introduces a brief history of MOOCs, its types, advantages and challenges. The paper describes its working mechanism and development in India along with some of the well-know platforms available today. MOOCs have developed rapidly due to their creative use of low cost online technologies to deliver higher education in new ways. This paper also assesses some of the key features of recent developments including the growth and profile of MOOC sector.

Key Words : *MOOCs, Online courses, Distance learning, Online learning*

Introduction

Massive Open Online Courses (MOOCs) are free, open access and scalable online higher education courses. It uses a variety of online resources (such as videos and message boards) and seek to capitalize on high volume student classes by encouraging peer learning networks in place of more conventional synchronous learning and academic instruction. The New York Times termed the year 2012 as "*The Year of the MOOC*".

This model of free, accessible and flexible delivery through third party platforms using broadcast and distributed peer learning represents a new relationship between academics, student, institutions and education technology firms.

History of Online Learning

Beginning with the first correspondence courses in the 1890s from Columbia University, distance learning has been an important means of making higher education available to the masses. As technology has evolved, so has distance learning; it began with mailing books and syllabi to students, then radio lectures, then TV courses, and now online courses and in just the last 5 years a new form of education has arisen, Massive Open Online Courses (MOOCs). MOOCs are becoming increasingly popular all over the world and the means by which learning

is measured, evaluated, and accredited has become topic of debate in higher education[2].

George Siemens and **Stephen Downes** coined the term MOOCs in 2008 while presenting a course, called "Connectivism and Connective Knowledge to 25 tuition-paying students at the University of Manitoba and offered at the same time to around 2,300 students from the general public who took the online class at no cost. Later, Jim Groom led a team of instructors in offering "Digital Storytelling" as a for-credit course at the University of Maryland Washington and as a free online course to the public. Students in both groups set up online spaces, told their stories, and published those using assorted digital media. A recent MOOC at Stanford University, "Introduction to Artificial Intelligence," taught by AI experts Sebastian Thrun and Peter Norvig, drew a world-wide open enrollment well in excess of 100,000 students[8].
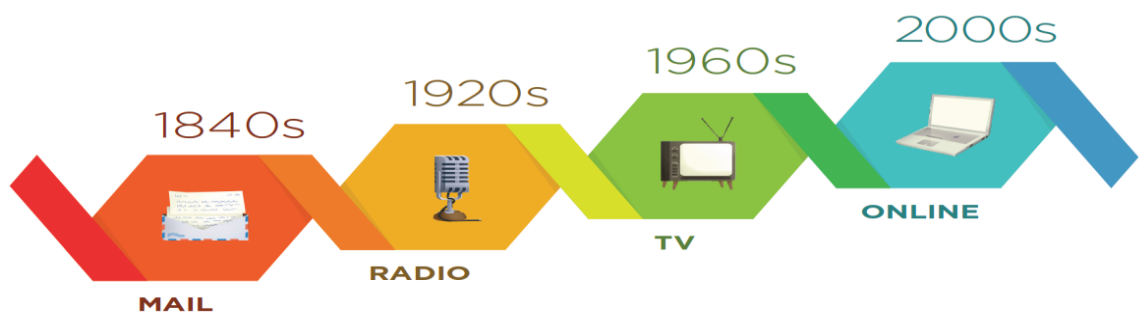

Fig. 1 History of distance learning

Characteristics of MOOC

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 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 hardships.

Openness - It involves several key concepts: software, registration, curriculum, and assessment; communication including interaction, collaboration, sharing; and learning environments. The software used is open-source, registration is open to anyone, and the curriculum is open, the sources of information are open, the assessment processes are open, and the learners are open to a range of different learning environments12.

Connectivism - MOOCs offer an emerging online teaching methodology inspired by a connectivist philosophy. Connectivism teaching strategies allow an instructor to assume the role of facilitator with learners actively interacting with other students. It is not a transfer of knowledge from instructor to learner in a single learning environment but MOOC is build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common

interests. Therefore, active engagement and interaction are key MOOC instructional methods6.

Types of MOOC

MOOCS are usually distinguishable from more conventional online distance learning by the absence or highly limited nature of personalised academic support and guidance for students.

Two broad categories of MOOCs have been defined, based on different pedagogical emphases and organizational models7.

cMOOC – These are courses based more closely on the original 'connectivist' distributed peer learning model. Courses are typically developed and led by academics through open source web platforms. Examples include various courses exploring developing online education practice, such as the original MOOC, Connectivism and Connective Knowledge.

xMOOC – These courses are typically structured around more convectional lecture formats and are increasingly delivered through proprietary learning management platforms with contractual relationships with institutions or individual academics. xMOOC typically describes courses offered through the Coursera, edX and Udacity platforms.

cMOOC vs. xMOOC Differences

cMOOCs	xMOOCs
• "social, technical system of learning where the teacher's voice is not an essential hub but a node in an overall network" (Siemens). • Creation/exploration of topic area in "atelier" environment • Unique products created by students (blog posts, images, diagrams, videos) • Discussion forums, Diigo groups, Twitter and other social networking are key • Facilitator aggregates, reviews, summarizes and reflects on activity in daily/weekly newsletter • "Boot-strapped" platform and collaboration tool.	• Pre-determined, instructor-led, structured and sequenced weekly activities • Short, content-based videos, readings, problem sets • Quizzes (auto-graded), peer-graded assessments • Discussion forum participation optional • Delivered via third party platform provider (e.g., Coursera, edX)[10]

Advantages

Online education provides opportunities to people who may not otherwise have the time for or access to a high quality education to enhance their skills and learn from some of the best instructors in the world. MOOCs have the potential to greatly and further spread higher knowledge and help individual professors gain larger recognition for their work.

Some of the areas in which MOOCs have been cited as most beneficial are—

Accessibility – Participants and instructors note benefits from the enhanced accessibility that

MOOCs offer. MOOCs, typically low cost or free, create irresistible appeal for recruiting potential participants. In addition, MOOCs have not been limited to college students, and/or professionals, but even younger students can participate in the MOOC experience[11].

Student Engagement - 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. Student engagement can also be enhanced as instructors recognize the learning styles of students and adapt their teaching strategies accordingly.

Lifelong Learning Experiences - MOOCs allow participants to pursue a particular interest or to continue their professional development. 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.

Anywhere, Anytime Learning - By providing a *no-risk option for learning*, MOOCs also encourage participation from those who lack time because someone facing a job change, a move to a new residence, or an upcoming project deadline has little to lose if they find they must end their participation midway through the course.

For the independent, lifelong learner, the MOOC presents a new opportunity to be part of a learning community. It proves that learning happens beyond traditional school-age years and in a specific kind of room. Its low barrier to entry invites those who may lack the confidence to attend for-credit classes and those who cannot afford more traditional college opportunities.

Those enrolling in a MOOC are likely to discover learning at its most open on a platform that invites the world not only to see and hear but also to participate and collaborate.

Challenges

The biggest challenge for librarians will be in supporting the resource needs of their institution's courses. The open nature of a MOOCs course necessitates using content with open copyrights. Some other challenges faced by MOOC are[4] --

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.

Student Performance Assessment - Cheating presents a major challenge of online education. How to validate original work to prevent or detect plagiarism is one of the widely discussed challenges in online education.

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[1].

Long-Term Administration and Oversight - 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[2].

Internet Connectivity – In a country like India, MOOC have a big challenge, when you take into

account our poor bandwidth. To take up a MOOC course, you do need good internet connectivity, especially when it comes to downloading videos. Either internet connectivity has to improve or the big players need to start thinking of mobile versions[14].

Language Barriers – It is a problem peculiar to India or other developing countries. It would be well for the students if the MOOCs were in a language they understood or at least they had subtitles (for video lessons). But even top universities don't have the resources for it. Although, MOOCs are now available in Spanish, Chinese, Arabic, Japanese and German etc. languages, but for India it would greatly benefit if MOOCs are available in regional languages too[14].

Government and policymakers are looking at MOOCs through the lens of affordability and accessibility. Faculties are raising questions about the influence of MOOCs on academic freedom, relevancy to institutional mission, and instructional quality[3].

The viability of MOOCs from an economic perspective is also a challenge. Without tuition or registration fees, current and past MOOCs have often been volunteer initiatives which raise interesting questions about the nature of value in a digital economy defined by an abundance of knowledge and participants as opposed to their scarcity.

MOOCs Working Mechanism

One of the key differences between MOOCs and the previous online approaches is that MOOCs are free. Students can take the courses at no charge. The pedagogy that MOOCs employ also differs significantly from traditional online learning. MOOCs use Web-based tools and environments (platforms) to deliver education and classes in a new paradigm without regard for geographic boundaries and time zones and to much larger audiences.

Unlike older forms of online learning, ***MOOCs are not asynchronous***; they are not like recorded class

sessions that a student listens to at his or her own pace sitting in a library, completing one lesson and then starting a subsequent one. Rather, they are similar to on-campus courses, delivered synchronously on a defined schedule—usually on a weekly calendar basis. A student in a far-flung location may take a particular lecture and do the related exercises in his or her own time zone during a convenient window of delivery[9].

A student may also make up for missed lectures at his or her convenience, although that will lessen the impact of some aspects of the cohort like approach to learning with fellow students.

With MOOCs, lectures are also structured differently. Rather than simply capturing a 45 or 60 minute lecture delivered in a traditional classroom and making it available online, faculty members record lecture modules tightly focused on various topics, lasting perhaps 12 to 15 minutes at most. One reason for that short duration is to allow students to "squeeze in" the content-delivery modules in convenient blocks of time during the synchronous window.

MOOCs are online courses where lectures are typically "canned," quizzes and testing is automated, and student participation is voluntary. They attain large scale by reducing instructor contact with individual students; students often rely on self-organized study and discussion groups.

On the technology side, the tools enabling web-based instruction are more effective and reach greater scale than ever before. **E-learning technologies** that are widely used in MOOCs include:

High-quality indexed video
Data capture and analytics
Delivery platforms that combine the qualities of social networking sites like Facebook with the content delivery, discussion, and grading functions of the traditional learning management system.

From a **cultural perspective**, communication, collaboration, and knowledge discovery via the web have become commonplace. Sites like **TED, Khan** **Academy, iTunesU, and YouTube**, which house rich collections of instructional material, have paved the way for MOOCs.
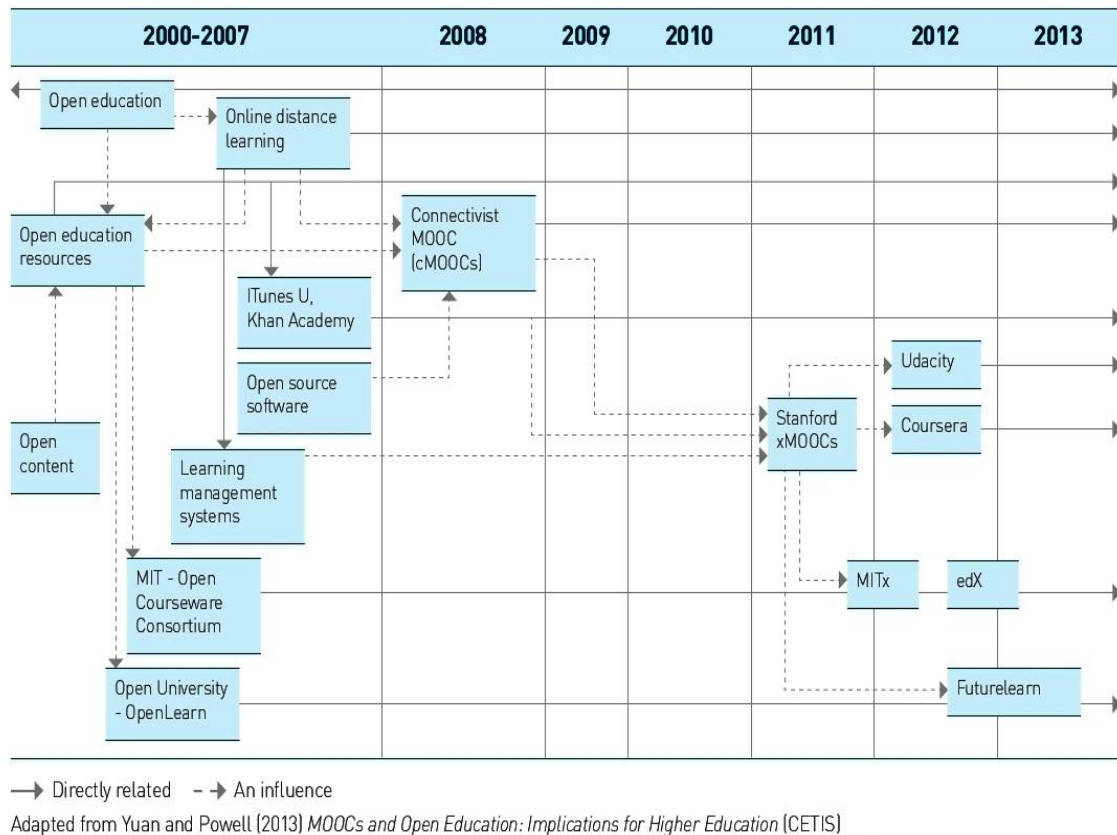

Fig. 2 Timeline of MOOC development

Some of the Better-Known MOOC Platforms

Coursera (www.coursera.org) Coursera is a private for-profit technology started by two Stanford professors (Daphne Koller and Andrew Ng) in April 2012. The company created an environment, built a learning platform, and subsequently engaged more than 60 universities including Stanford, Princeton, California Institute of Technology, University of Washington, University of Edinburg etc. and University of Virginia, Duke University, University of Pennsylvania, University of Illinois partners in developing course content. It offers over 300 courses from wide range of subjects. It has less centralized quality review process but reserves right

to remove content of insufficient quality. Coursera has achieved 3 million registered users by 2013.

Futurelearn (www.futurelearn.com) Futurelearn is a third party for-profit enterprise owned and funded by the Open University. It aims to deliver a learning experience that is engaging and entertaining and allows people to fit learning into and around their lives, whenever and wherever it suits them. It harness the skill and expertise of the Open University to allow students across the world to access high quality education online from some of the UK's foremost educational institutions.

edX (www.edx.org) edX is a not-for-profit enterprise owned and funded by MIT and Harvard committing

to $60 million investment in January 2012 and, as of December 2012, had expanded to include courses form 12 members of **edX consortium:** MIT, Harvard, University of California at Berkeley, the University of Texas System, Wellesley College, Australian National University, University of Toronto, RICE, TU Delft, McGill and Georgetown University. It offers 33 courses from wide range of subjects including social sciences and humanities, physical and natural sciences, computer science, law and health. It has achieved 7 lakh registered users by 2013.

Udacity (www.udacity.com) Udacity is a for-profit enterprise supported by venture capital firms and was set up by Stanford Professor Sebastian Thrun with Mike Sokolsky and David Stavens, and then joined by University of Virginia Professor David Evans. It works with individual academics and in collaboration with technology firms, like Google and Microsoft. Innovative course interface with blended interaction between video and exercises. Udacity offers 22 courses; all focused on computer science and associated technology subjects. It has achieved 4 lakh registered users by 2013.

Udemy (www.udemy.com) was founded by Eren Bali and Oktay Caglar, who have built a platform that invites individuals (rather than institutions) to offer online courses. It allows anyone to create and offer a course, whether free or for a fee[7&9].

India and MOOC

India is Coursera's second largest market outside the USA after China, with almost eight lakh registered learners. Indians have a strong appetite for technology and computer science courses – more than in any other country and in business management as well. Karnataka has the largest number of Courserians, while Maharashtra and Delhi take the second and third positions, respectively. Indian learners are very young and many of them are in their twenties.

MOOC offers courses that teach skills for the most in-demand jobs in the IT industry in India. Indian

market is primed for adaption, as it has a great need for quality education to bridge the skill gap. But interest from learners in India will only increase with expanding internet access[14].

Conclusion

The MOOC is an emerging model, presenting an exciting set of challenges and opportunities for both instructors and students. 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. However, in a time when higher education is being criticized for low productivity, increasing costs, and inefficient use of technology (Richard C. Levin, 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 severity and ensures student success.

Although educators, librarians and administrators might proceed with caution, it would be sensible 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. With MOOCs being only three years old, time is a factor in its success. Only time will tell if MOOCs are a passing trend or predict the future of higher education. With time, the hope is that MOOCs would become efficient by catering to a wider section of the society. The field of higher education will see massive and constant change in the near future, and MOOCs will continue to play a major role in its rapid

evolution. How Librarians will play a part in this revolution of learning is yet to discover.

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