FROM E-LEARNING TO MOOC

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ABSTRACT

This paper reviews the emergence of MOOC (Massive Online Open Courses), its development, the status quo and its trends to the future. In the past two years, MOOC has witnessed a great expansion in world education and the numbers of institutions which provide MOOCs have dramatically increased. This phenomenon has researchers commenting that MOOC is bringing a revolution to e-learning and education, and most traditional physical universities may disappear in future. However, after depicting MOOC features, common MOOC designs, the strong points of MOOC and MOOC's disadvantages in, this paper concludes a different view. That is although MOOC may have brought significant drivers of education innovation, it is still too early to assert that MOOC will replace e-learning and become the future of world education. That MOOC is just one of a number of e-learnings, proper for a certain group leaners at a certain time for a certain purpose.

KEYWORDS

Massive Online Open Courses, Status Quo, Features, Pedagogies, Trends, Limitations

WHAT IS MOOC?

The acronym MOOC first appeared in December 2011 (Kim, 2011) in reference to an artificial intelligence course offered by a Stanford University professor. The term "Massive" refers to an educational institution offering courses enrolling a lot of students. "Open" means these courses are free for anybody in the world to access. "Online" indicates this is a form of e-learning and learners needs to study via the internet. The courses are taught via digital forms of media, not through paper books, face-to-face lectures and chalk scratches on the blackboard. "Courses" means the learning content provided is not fragmented knowledge, but a course which is designed for learning step by step. Although the name of MOOC does not define the course providers, the providers are usually among the best universities in whichever country. In MOOCs, learning materials are delivered via an LMS (Learning Management System) which usually has functions of emending video clips, group assignments, discussion forums, and social networks.

The first massive open online course was delivered in Canada, in 2008 by George Siemens, a professor of Athabasca University, and Stephen Downes of the National Research Council. The course was called "Connectivism and Connective Knowledge" and was a massive online event that invited learners from around the world to discuss a range of topics. Since then, this new form of e-learning has attracted much attention from educators in North America. 2012 was called "The Year of the MOOC" by The New York Times (Pappano, 2012). Indeed, education saw a rapid spreading

of MOOC in the United States in 2012. MOOC continued to dramatically gain popularity all over the world in 2013. And this year, not just limited to North America - Europe, Australia and East Asia have also launched MOOCs.

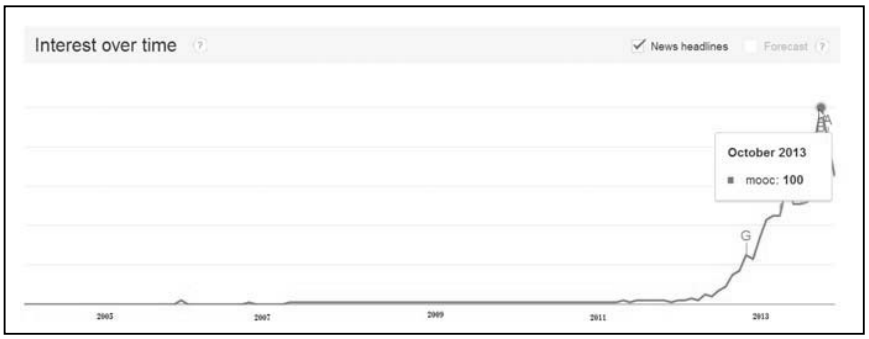

Figure 1: MOOC search over time on Google

WHY IS MOOC?

MOOCs allow 'average' people access to learning resources provided by famous universities which usually educate elites only. It breaks down university walls and it shortens the distance between universities and 'commoners'. Most MOOCs are free to anyone, the only requirements are a computer with internet connection, one's learning desire and the effort required to complete the courses. The following are regarded as the reasons for the popularity of MOOCs.

(1) MOOCs make elite education available to the general public. Among the names of universities which offer thousands of such courses, most are famous: e.g. Stanford University, Duke University, Harvard University - in the U.S; Tokyo University and Kyoto University in Japan; and Beijing University, Shanghai Jiaotong University and Fudan University in China. MOOC takers are instructed by the same professors as campus students. In MOOCs, education resources which used to be only available for a very small group of elites can now be accessed by anybody who is interested in learning.

(2) MOOCs are usually taught by noted professors. Before MOOCs are put online by an institution, they have usually been popular courses with campus students in physical classrooms. Moreover, MOOCs contain popular content as well as being taught by popular professors.

(3) Technically and pedagogically, MOOCs are usually well-designed. Currently, platforms which provide MOOCs are all backed up by the institutions themselves or by the government, and technically supported by major IT companies. JMOOC (Japan Massive Open Online Course s) serves as a good example. This newly established MOOC organization involves NTT and Fujitsu, both being IT giants in Japan. It is not an overstatement to say that MOOCs having the best professors in the best universities offer the best learning content on the best e-learning platforms.

(4) MOOCs make country borders blurred. Learners can easily take a course provided by a university in a county which they might never have the chance to visit. MOOCs make education

gaps disappear.

(5) Not very much hardware is required to take a MOOC. Basically, if you have a personal computer which is connected to the internet, then you can take MOOCs. Possessing a diploma is never a pre-condition for MOOC registers. Generally MOOCs are free to register and free of charge. Although most courses have beginning and finishing dates, learners can participate and then quit the course at any time they want. Learners usually first watch a video clip of a lesson lecture by a professor and then do assignments online. When learners have questions, they can post questions in a discussion forum. The questions are directly answered by the instructor or assistants. Sometimes, instead of the professor answering, learners themselves also answer questions from each other - a kind of peer review. Social media such as blogs and wiki are often adapted for the learners to share ideas and learning experiences. More and more MOOC courses now also organize meet-ups for learners who live in the same city. Most MOOCs issue certificates and credits when learners complete a course and pass the exam. And a small number of universities also provide degree education via MOOCs.

MOOC IN THE WORLD

MOOCs originated in North America and spread throughout North America first. North America is still the continent that has the most MOOCs. The three biggest MOOC providers: Courseara, Udacity and edX are all in the United States (The New York Times, 2012). Up to December 2013, through the platform of Couseara, 107 world-famous universities in a number of different countries are providing 559 courses for 5,805,291 course-takers themselves located all over the world. Learners watch short video lectures, take interactive quizzes, complete peer graded assessments, and interact live with classmates and instructors. When students complete a course, they receive recognition remarks.

Figure 2. Coursera front page

UDACITY started from three most popular computer courses freely offered online from Stanford University in 2011. Of the three courses, Introduction to Artificial Intelligence offered from October 10th to December 18th, 2011 was a huge surprise. Taught by Sebastian Thrun and Peter Norvig this course attracted 160,000 students from over 190 countries. With such a solid foundation, UDACITY was born. UDACITY does not offer free courses and is run via a business model.

Figure 3. UDACITY front page

edX is a nonprofit MOOC platform funded by Harvard University and Massachusetts Institute of Technology (MIT). By December, 2013, this platform was offering 125 free courses provided by 30 of the world's best universities. Online courses in edX range from business, computer science, economics, science, engineering to food and nutrition, and more.

Figure 4. edX front page

While MOOCs were gaining popularity in North America, Europe remained quiet. In April, 2013, partners from 11 different countries, including Israel and Russia, joined forces to launch the first pan-European MOOCs initiative with the support of the European Commission. The platform is called OpenUpEd. OpenUpEd aims at opening up education “with an offer that reflects European values such as equity, quality and diversity”. The high-quality learning materials are designed for self-study. Eleven institutions have joined the project and are offering 164 courses in a number of different languages. Compared to MOOCs in North America, European MOOCs are still in the early stages. Besides OpenUpED, iversity, a German MOOC platform, has some interesting concepts in designing and delivering their courses.

2013 was a MOOC year for China. The two best Chinese Universities, Beijing University and Tsinghua University joined edX. Then Fudan University and Shanghai Jiaotong University joined Coursera. What was a milestone for MOOC in China was the emergence of a Chinese version of MOOC. Shanghai Course Center, administered by Shanghai Education Commission, now has more than 30 university members located in Shanghai City. University students in the Shanghai region can take common courses and will be rewarded with credits. What was more encouraging, in August, 2013, was that five universities from Taiwan and mainland China launched a MOOC project called “ewant”. ewant is completely free for any Chinese anywhere in the world who wants to study courses in the Chinese language. ewant is the first real MOOC platform designed in Chinese for Chinese people in both mainland China and overseas.

Figure 5: First Chinese version of MOOC

In Japan, MOOC has not received much attention. Although Kyoto University joined edX and Tokyo University joined Coursera, the courses these two universities provide are limited and all courses are only in English. In Japan, MOOC has not so far been a topic for discussion of any academic society. The good news is that an organization aiming at MOOC development, called JMOOC (Japanese Massive Online Open Sources) was established in November, 2013. Thirteen courses from 13 well known Japanese universities are scheduled to appear online in 2014.

MOOC PEDAGOGIES AND DESIGN PRINCIPLES

As MOOCs are essentially online courses, all e-learning pedagogical theories - such as Constructivism, Behaviorism, Informal Learning, Blended Learning, Collaborative Learning and Self-study - are all applied to MOOC designs. The differences between MOOC and the other forms of e-learning is that MOOCs are open and massive. Thus theories of Open Education and Connectivism are theories that back-up MOOC.

The author has observed courses ranging from computer science, statistics and literature offered on Udacity, edX and ewant. It was found that all courses are guiding - not leading - course goals and learning plans are clearly set; learners' collaboration is needed through teams working online or by topic discussions; peer review and peer assistance are required throughout the course. Assessment such as quizzes and exams are regularly carried out to verify learning outcomes; learners' feedback about every lesson is always encouraged and welcomed.

Among the courses observed, those offered by Udacity are a good example to reflect the above design principles. Every course starts with lecture videos, then quizzes and assignments. Multiple short video sections make up each course unit. Each video roughly lasts five minutes or less, giving learners the chance to learn piece by piece. Each unit is designed for a weekly-learning pace. However, since Udacity enrollment is open, the learners can take as long as they want to complete Udacity courses. Udacity courses include discussion forums and a wiki for course notes, additional explanations, examples and extra materials. Each course has an area where instructors can make comments

CHALLENGES AND LIMITATIONS OF MOOC

Seeing MOOCs' popularity and its dramatic expansion in 2012 and 2013, some researchers and educators assert that MOOC is the second revolution in education - after typography technology. It is suggested that as learners are likely to be attracted to low cost, high quality MOOCs, 'good' universities excepted, many current "traditional" universities will likely disappear or at least find it difficult to survive. However, the present situation does not seem to indicate this. MOOC is still new. Many practices in MOOCs are still experimental. MOOCs currently face a number of problems and challenges:

(1) Very high drop-out rate. Although some courses have enrolled more than 100,000 students, course completion has never been more than 10%. For a number of course, eventually only about 1% of the initial course takers were able to finish the course, pass the exam - and receive the certificate. Most learners had dropped out by the half-way point. Not unnaturally, it is hard to keep high motivation if MOOC is not socially recognized and/or recognized by employers in the job market. Students who failed to complete all requirements by MOOCs claimed a lack of time, insufficient math background or that they just wanted to view the lectures from the outset in the beginning. Regardless of completion status, many students were primarily seeking enjoyment or educational

enrichment. Obliviously, this lack of consistent motivation can be seen as the major reason for the high drop-out rate in MOOCs.

(2) Platform stability and affordability of MOOCs is not always sturdy for massive learners. The current platforms of MOOCs usually use the same technical modules for all courses. Every course follows the same pattern: watch video lecture, do the quizzes, discuss and peer-review online - and give feedback. Obviously, different course should be taught in different way: some need more field-work, some need repeated demonstrations and explanations. How to teach so many students effectively is not well-researched. How to disseminate content to massive number of students, is technically challenging. MOOC platforms usually provide some built-in social tools: online discussion and idea sharing - but how to monitor and guide online activities in social networks is still a challenge.

The investment to develop and maintain courses is another problem. To develop a course needs technology, money and time. To offer a MOOC needs consistent care. These known costs, coupled with uncertainty about whether the MOOCs will make enough profit, financially or socially, for institutions to recover their investments, may scare away some institutions. For example, in Japan, where national and public universities are facing budget cuts, they are very unlikely to take such risks by going into MOOCs.

(3) To verify learning efficacy in MOOCs is difficult. MOOCs do check learning outcome via quizzes and feedback. However, as learning is autonomous, self-paced and voluntary - and the number of learners is massive, the learning outcome is impossible to be effectively and fairly evaluated. The lack of timely and real learning evaluation could seriously lower students' learning motivation, and eventually lower the rate of course completion.

(4) Instruction is a daunting task for MOOC instructors. Surveys have suggested that MOOC professors typically spend 100 hours, sometimes much more, to develop their massive online courses, and then a further eight to 10 hours each week while the courses were in progress. This commitment has amounted to a major drain on their normal campus responsibilities (Kolowich, 2013). As the number of MOOC takers is usually large, course instructors cannot respond to a huge number of questions from learners. It is impossible for one instructor to write feedback for every question as they can do in physical classrooms. Teaching assistants could do part of this instructor job, but this may lower the expectation of learners. Patience, flexibility and resilience on the part of instructors and course technical staff are key elements in the success MOOCs (Belanger &Thornton, 2013).

CONCLUSION

In this paper, the author reviewed history, platforms, characteristics, design principles of MOOC and its status quo of development around the world. The paper particularly focused on the challenges and problems of MOOCs after observing MOOC courses on different platforms. Based on the observations of the existing courses and an examination of the learning outcomes of MOOCs, this

paper concludes that MOOC is indeed an innovative application of e-learning and it does bring a brand new form of education to people. However, due to the inherited limitations, MOOC is unlikely to replace the current educational systems and is far from being a revolution. Before MOOC is "massively" introduced to Japan, its essence should be made well known and its feasibility and applicability to Japanese society should be well researched.

REFERENCES

J,Kim.(2011).Grad Students and Digital Education, Retrieved on December 25, 2013, from http://www.insidehighered.com/blogs/technology-and-learning/grad-students-and-digital-education

J, Mackness., S, Mak., & R, Williams.(2010). The Ideals and Reality of Participating in a MOOC in D-H L., & H, Jone (Eds.) *Proceedings of the 7th International Conference on Networked Learning 2010* (pp. 266-270)

L, Pappano.(2012). The Year of the MOOC. *New York Times*. Retrieved on December 25, 2013 from <http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?_r=0>

S, Kolowich. (2013). Why Some Colleges Are Saying No to MOOC Deals, at Least for Now. *The Chronicle of Higher Education (Technology)*. Retrieved on December 26, 2013 from <http://chronicle.com/article/Why-Some-Colleges-Are-Saying/138863/>

The New York Times (2012). The Big Three, at a Glance. The New York Times, Retrieved on December 24, 2013 from <http://www.nytimes.com/2012/11/04/education/edlife/the-big-three-mooc-providers.html?_r=0>

Y, Belanger., & J, Thornton.(2013). Bioelectricity: A Quantitative Approach Duke University's First MOOC. Retrieved on December 26, 2013 from <http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf?sequence=1>