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Thinking about MOOCs

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Thinking about MOOCs

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Abstract

Massive Open Online Courses (MOOCs) started quickly in top western universities. These free online courses from famous universities push down the walls of traditional classroom and bring great impact to education. The paper discussed the changes MOOCs bring, including learners changed from local small groups to global numerous learners, teaching faculty changed from individual teachers to collaborative teaching teams. Then the paper put forward the nature of MOOCs and gave some general consideration of CNMOOC platform which is under developing as MOOCs, big data and mobile technologies are on the rise.

Keywords: MOOCs, collaborative teaching, collaborative learning, blended learning, mobile learning

Introduction

MOOCs boosted

Massive Open Online Courses (MOOCs) reached a rapid growth in 2013. Here we understand that massive means many students and open means free.

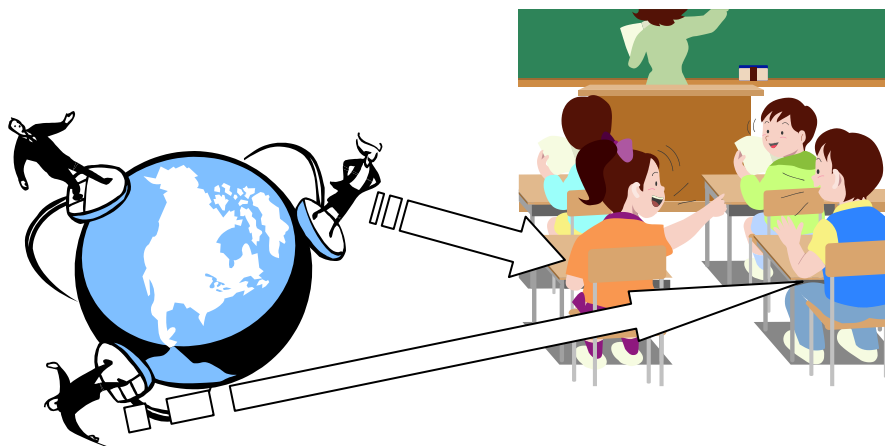
Coursera platform started by two Stanford professors Daphne Koller and Andrew Ng on 2012, announced that 121 universities had agreed to cooperate with them and more than 1285 courses are open to all. Coursera had 14,824,768 students already. Coursera partners with schools like Yale University, Johns Hopkins University, University of Edinburgh, Peking University, and others to offer courses in dozens of topics, from computer science to teaching and beyond. Coursera wants to provide open online education for everyone.

EdX open-source technology platform founded by MIT and Harvard University on 2012, had more than 568 open courses and programs with 77 universities and organizations like Berkeley, Boston and Tsinghua universities joined. Its goals, however, go beyond offering courses and content. EdX is committed to research that will allow them to understand how students learn, how technology can transform learning, and the ways teachers teach on campus and beyond.

Another two professors from Stanford University founded Udacity which aims to be a commercial educational content provider.

These online open courses which are mostly free and non-degree oriented pushed down the walls of the traditional classrooms making it possible to join classes in the top universities all over the world as Figure 1 illustrates. The number of students enrolled in a class listening to a famous teacher could be thousands, far exceeding that in a traditional classroom.

Figure 1. *No Walls for Classrooms*



It changed and is changing the education. The article “The End of the University as We Know It” on the website of the American Interest predicted that in fifty years, if not much sooner, half of the roughly 4,500 colleges and universities now operating in the United States will have ceased to exist. It is both a challenge and a chance for traditional universities and tutors.

Education in China

Education Gap

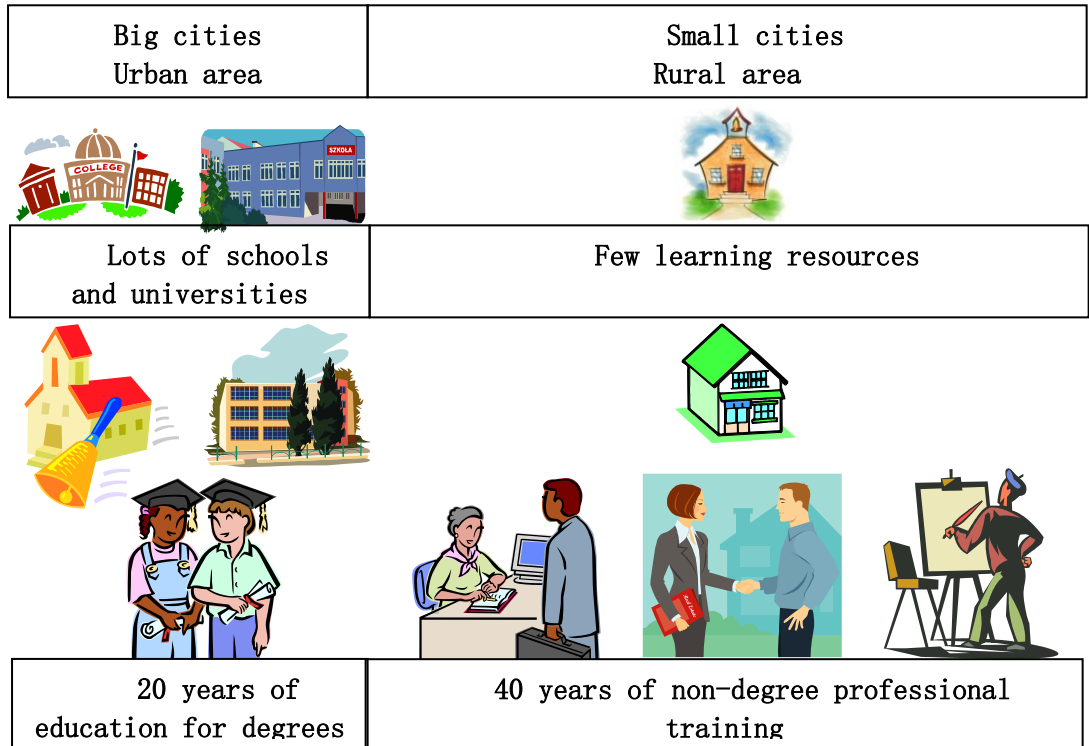
In the traditional education system in China, education resources especially talent teachers are not well distributed in the country like Figure 2 shows. There are more of them in big cities than in small ones and more in the urban area than in the rural area. The number of teacher per students in big towns is 1:19 and this number in small cities or villages is 1:23. It is believed that this does make a difference as the courses offered in everyday are some kind of inferior to others.

Non-Degree Education

In the traditional education system in China, education are mainly focused on the degrees. It pays much more attention to the degree education of a man for the first 20 years of his life but less to the non-degree education or professional training which could last nearly 40 years after he goes into the

society as figure 2 shows. Actually it is the particular skills suitable for the work place not the degrees that companies are looking for.

Figure 2. *Unsatisfying Distribution of Education Resources*



As MOOCs are on the rise, it seems that these two problems may be solved at some extent.

Changes MOOCs bring

Learners all over the World

Students are not only those sitting in the traditional classrooms in tens or hundreds but also those all over the world in thousands even millions. The audiences are different in various ways such as geographic location, age, culture, language and time zone. In these learners, there are both teenage children and old people above sixty.

The teaching and learning activities under the cross culture and non-face-to-face situation are a new challenge for both teachers and learners [Xi Zhang, Patricia Ordóñez de Pablos, Qingkun Xu. 2014]. Interactions between them have to take the time zones into consideration.

Collaborative Teaching Team

A course is no longer one tutor's work but a collaborative teaching team's. For instance, "Technicity"¹ on Coursera had two major teachers with

¹"Technicity" is an online course on Coursera from Ohio State University.

professors from other universities and employees from Cisco participating in teaching. Another course named “Creative programming: for digital media and mobile apps”¹ on Coursera involved three teachers.

As teachers are not only professors in universities but also employees in companies, it also becomes natural that teaching is a kind of cooperative team work [Blanchard, Kathryn D. 2012]. Of course it is true because no teacher could master all of the knowledge in this era. It could help students a lot while professors from different schools explain a problem in different views and employees from different corporations tell stories in real world.

Collaborative, Self-Paced and Short Time Learning

Learning is no longer an individual work in a class but a collaborative and interactive one with the world wide students. For example, learners can use wiki to discuss ideas with each other on edX and on Coursera they are asked to complete peer graded assessments. These collaborative activities between teachers and students stimulate some kind of social interactions in studies [Shengquan Yu, Gang Cheng and Jingfeng Dong. 2009] which help them to continue studying in a virtual class. The another benefit is that by arguing with others and at the same time argued by others, learners could adjust their opinions and reach critical conclusions which may form virtual apprenticeship [Curtis J.Bonk. 2009] and help them construct knowledge in society [Jian Zhao, Gang Wu. 2008].

Studying becomes a personal decision in many ways. Firstly, learners could choose what courses they are interested to study. Sometimes they can even choose teachers as there are many of them teaching the same topics. Secondly, learning is more self-paced than scheduled which means that learners could study on their own schedules, fast or slow, in the day or at the night, more today or less tomorrow. Thirdly, they can skip any of the materials at their wills if they have mastered that part or study them in their preferred order. Lastly learners have an opportunity to choose their learning partners from the classmates all over the world.

Learning a specific knowledge point is generally a 30 minutes work on MOOCs which involves watching a short video lecture of 15 minutes, taking interactive quizzes and connecting with classmates and teachers. This would be very helpful as half an hour is easy for most of people to spare and pay attention to what they are learning. In addition to that, a 15 minutes short video could also be easily loaded into smart phones or tablets which enables learners to study anywhere they are and utilize fragments of time.

Big Data Driven Improvement

Both Coursera and edX collect data in the whole learning process to understand how students learn, how technology can transform learning, and the ways teachers teach on campus and beyond. Take a course named “Technicity” on Coursera for example, students’ data such as physical locations and learning

¹“Creative programming: for digital media and mobile apps” is an online course on Coursera from University of London.

devices are gathered to help adjusting the lecture content. These big data contribute to improve not only the courses but also MOOCs platforms [Karel Dejaeger, Frank Goethals, Antonio Giangreco, Lapo Mola, Bart Baesens. 2012].

Non-Degree Education

There is no limit including degrees and ages for learners to enroll on Coursera and edX. Everyone who is interested could study the courses no matter if he is a teenager in middle school or a retired man with no degrees. Students who complete successfully their assignments will receive recognition of accomplishment for that course. If students pay for a little, they could get “Signature Track” from Coursera. In addition to the course name and instructor signature, the “Signature Track” or course certificate features the logo of the partner institution offering the course, a statement attesting to the confirmed identity, and a certification URL that allows others to check the Certificate’s authenticity. It is not a degree diploma but a non-degree certificate.

Non-Tuition Business Model

Both Coursera and edX are open MOOCs platforms while Coursera had 108 collaborators already and edX had 32. Their sustainable model or business model may be based on charges for data and services, not on tuitions.

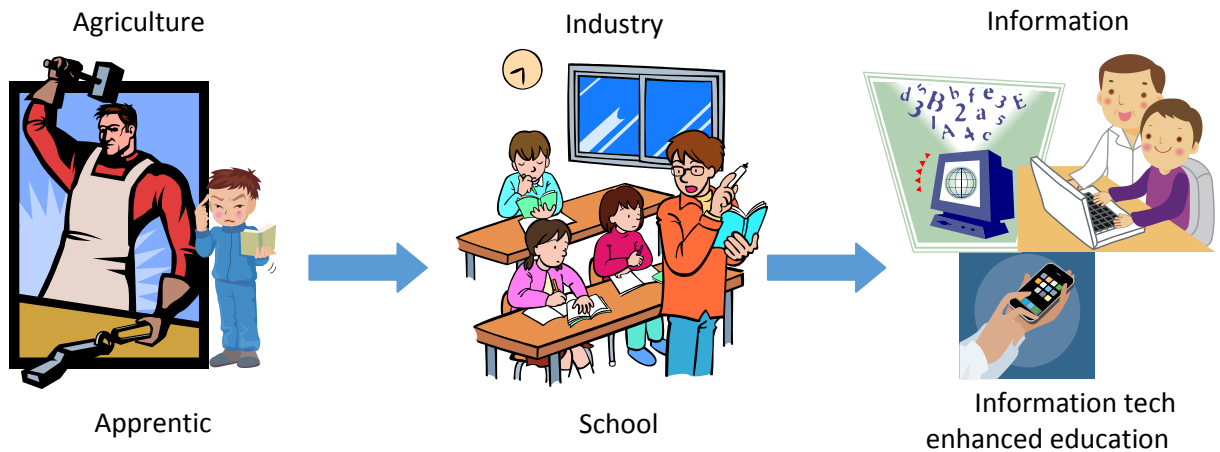
On Coursera those learners who would like to get a verified certificate issued by Coursera and the participating university have to pay for that. By linking coursework to identity, it could prove that it is the person — and only this person — did all the work. Learners could list their verified certificates on their résumé/CV or include it on social media. Another interesting money earning way is that talent students will be recommended to companies which pay for this service.

The nature of MOOCs

Allan Collins has given a speech of “The Second Education Revolution: from apprenticeship system to school education then life-long learning” [Jiagang Chen, Jingran Zhang. 2009]. Jiening Chen, president of Tsinghua, said that MOOCs bring revolution to education not only in technologies areas but also in education concept, education system, teaching methods and training process.

As the information technologies being applied in all kinds of industries, revolutions in them are taking place. Education is no exception. MOOCs in its nature are a beginning of this revolution in education. Figure 3 shows the evolution that education shifts from apprenticeship system in agriculture society, to school education in industry society, then information technologies enhanced education in information society today.

Figure 3. Evolution of Education



Compared with the other two, MOOCs could be understood in the following issues in table 1.

Table 1. Our Comparison of Three Education Systems

	Apprenticeship	School system	Information tech enhanced education
Drive	Handicraft industry	Industrial revolution	Information technologies are changing industries
Need	Apprentice	Workers with skills	International, cooperative and strong hands-on talents
Concept	Secret	Discipline	Open
Goal	Experiences and tricks are passed on	Specials are trained massively and quickly	Anybody anytime anywhere could learn any knowledge from anyone
Way	One to one Face to face On site examples and precepts	One to many Face to face Classroom based school system	Many to many Blended Information technologies enhanced education

What to Do in Moocs

In this revolution of education with the fast development of MOOCs, big data and mobile network technologies, it is both an opportunity and a challenge. Figure 4 illustrates our understanding of the goal in three parts.

Source

As for source of MOOCs, it is what contents or services are provided.

For educators, it is important to participate in MOOCs so that they keep in touch with the innovations and learn about new and innovative ideas like flipped classrooms, blended learning and collaborative teaching [Gang Chen,

Ruimin Shen, Jiajun Wang and Zeyu Chen. 2007] could be absorbed and then practiced. Courses taught by tutors from different universities, employees from various companies could give students a wide vision. These new models are changing the way teachers used to teach and students used to study.

Fortunately, most of MOOCs platforms are open and free for learners and teachers, for instance edX is an open source platform which everyone could learn from it and make a contribution. Other technologies in MOOCs like mobile and big data techniques are developing fast and worth paying attention to.

Transmission

As for transmission of MOOCs, it is how to provide contents or services to learners.

Although most of MOOCs are focusing on internet based online courses, mobile learning is coming as iTunesU offered education contents and Coursera released its own mobile apps. People today could bare having no computers but could not live without a mobile phone or smart phone. Educators have to do more than just watch mobile learning happen [Nicky Hockly. 2013].

For MOOCs platform designers, mobile technologies, especially for social interactions, should be taken into account. Take Coursera as an example, fifteen minutes of short videos, easily loaded into mobile phones and help learners utilize fragments of time are recommended for courses producers.

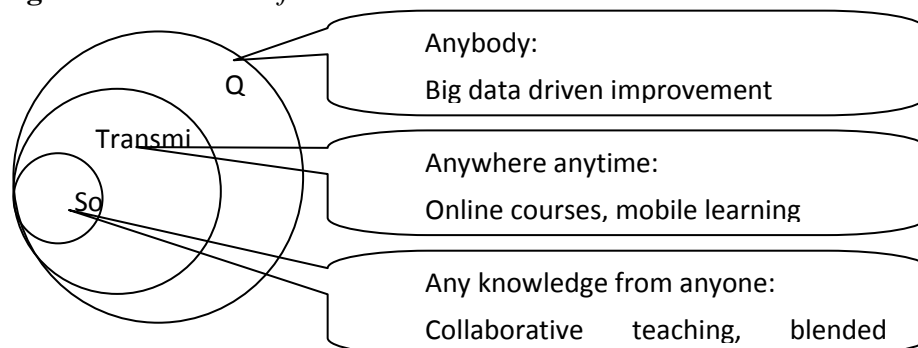
Quality

As for quality of MOOCs, it is how to help students learn efficiently and effectively.

Both Coursera and edX collect data in the whole learning process to understand how students learn, how technology can transform learning, and the ways teachers teach on campus and beyond. These include activities involved, new methods or tools applied in the courses.

All of the big data collected would contribute to improve not only the courses but also MOOCs platforms [Mohd Maqsood Ali. 2013]. These will lead to a data driven improvement of quality.

Figure 4. *The Goal of MOOCs in Three Parts*



Our practice

E-learning Lab of Shanghai Jiao Tong University (SJTU) participated in the development of CNMOOC of SJTU from 2013 which is under testing now (<http://www.cnmooc.org/>) as figure 5 illustrates. It had more than 131 open courses and programs like mathematics and Chinese medicine, and 48 universities and organizations such as Shanghai university of TCM, Tongji university and Xian Jiaotong university joined. Peer assessments, learning data collection, personalized resource pushing, online quiz and learning status visualization are implemented in the system while mobile learning is planned to be supported.

Figure 5. Website of CNMOOC



Conclusion

As education shifts from apprenticeship system in agriculture society, to school education in industry society, then information technologies enhanced education in information society today, MOOCs are changing the world education. Together with mobile and big data technologies, this revolution is a challenge and an opportunity for China at the same time.

References

- Xi Zhang, Patricia Ordóñez de Pablos, Qingkun Xu. 2014. "Culture effects on the knowledge sharing in multi-national virtual classes: A mixed method," Computers in Human Behavior (2014:31), pp. 491-498.

- Blanchard, Kathryn D. 2012. "Modeling Lifelong Learning: Collaborative Teaching across Disciplinary Lines," *Teaching Theology & Religion* (15:4), pp. 338-354.
- Shengquan Yu, Gang Cheng and Jingfeng Dong. 2009. "A New Insight into e-learning: Transformation of Online Education Paradigm," *Journal of Distance Education* (2009:3), pp. 3-15.
- Curtis J. Bonk. 2009. *The World Is Open: How Web Technology Is Revolutionizing Education*, East China Normal University Press.
- Jian Zhao, Gang Wu. 2008. *The Construction of Learning Community*, Shanghai Education Press.
- Karel Dejaeger, Frank Goethals, Antonio Giangreco, Lapo Mola, Bart Baesens. 2012. "Gaining insight into student satisfaction using comprehensible data mining techniques," *European Journal of Operational Research* (218:2), pp. 548-562.
- Jiagang Chen, Jingran Zhang. 2009. "Understanding Apprenticeship, Technology and the Second Education Revolution: a Conversation to Allan Collins, Professor of Northwestern University", *China Audio-visual Education* (2009:4), pp. 1-5.
- Gang Chen, Ruimin Shen, Jiajun Wang and Zeyu Chen. 2007. "Collaborative Education Model and Its Application in E-learning", 6th IEEE/ACIS International Conference on Computer and Information Science, pp.856-860.
- Nicky Hockly. 2013. "Mobile learning", *Elt Journal* (67:1), pp.80-84.
- Mohd Maqsood Ali. 2013. " Role of Data Mining in Education Sector", *International Journal of Computer Science and Mobile Computing* (2:4), pp.374-383.