MOOC and E-Learning 2014

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Abstract - In the year 2011, several countries were interested in new educational system named “MOOC (Massive Open Online Course)”. Stanford University introduced the first subject of MOOC named “Introduction into Artificial Intelligence”. There were 160,000 learners from different countries studying this subject through the Internet. Several papers reviewed that MOOC systems which combined with many famous universities, however; in the United States did not have any clear business model. On the other hand, MOOC could be the solution to the higher educational problems in each developing country. This was because MOOC provides opportunities to people in developing countries to gain their knowledge for free from world famous universities, for example, in the United States. In addition to study for degree, education for professional training was also available through MOOC system. Thus MOOC was considered as the tool to increase educational study and MOOC simply relevant with eLearning. This paper, therefore, discusses about MOOC with eLearning and divided into several topics include The Evolution of MOOC, Types of MOOC, MOOC For Development, MOOC in Thailand, MOOC Training, MOOC Seminars, MOOC Journals, and MOOC Learned Societies. This paper summarized that as MOOC becomes really important in the present days, people in the education industry should consider more on MOOC to provide better education to the new generation. Especially in the developing countries and Nondeveloped countries should ask for help to start developing MOOC for their own countries.

Keywords - Education, MOOC, MOOC in Thailand, MOOC Evolution

I. INTRODUCTION

From Wikipedia [1] and paper titled “High Speed Internet with the Development of the National Education” [2]; in the year 2011, every country in the world was interested in new Educational system named “MOOC = Massive Open Online Course”. Stanford University introduced the first subject of MOOC named “Introduction into Artificial Intelligence”. There were 160,000 learners from different countries studying this subject through the Internet.

After that, many famous universities had started to develop their own MOOC, such as:

- Coursera with more than 10 millions learners
- Udacity with 26 free subjects provided and 12 paid subjects
- edX with more than 3 millions learners over 300 subjects

There are many articles related to MOOC as the examples from Google Search. From the Google search, it has been said that MOOC systems which combined with many famous universities in the United States don’t have any clear business model. However, the fact is that there are some MOOC systems that define clear business model before the famous MOOC systems did.
In April 2007, there was a MOOC system, created in Ireland named “Alison” [3, 4] which had their own business model which is providing free courses for the learners but there were advertising charges from the companies that would like to promote as same as advertisement on radio and television. The advertising charge was Pay-per-click advertising. In the year 2014, Alison provides more than 600 subjects for free.

There were comments starting that [5] MOOC could be the solution to the higher educational problems in each developing country. This is because MOOC provides opportunities to people in developing countries to gain their knowledge for free from famous universities in the United States. Also, World Bank [6] has been questioned about how to use MOOC properly for education to citizens in the country. In addition to study for degree, education for professional training is also available through MOOC, for example:

In October 2013, Medical College in Harvard University provided Medical professional training through edX and there were thousands and thousands learners who are interested in this subject from around the world.

II. THE EVOLUTION OF MOOC

Before digital era, around the year 1920, in the United States, educational system was processed by sending post mails and listening to radios which had more than 4 millions learners which was higher than the number of students in the classroom.

In the year 1922, New York University opened the radio station to broadcast knowledge for each subject. After that, there were many universities followed the procedures, including:

- Columbia University
- Ohio State University
- Harvard University
- Purdue University
- Kansas State University
- Wisconsin University

Each university tried to follow New York University by leaving the learners to read the textbooks on their own and do their assignments to submit through post mails. After that, they produced videos to train new soldiers in the United States.

In the year 1994, Pennsylvania University offered Internet Seminar subject by teaching through Gopher and e-mails with having more than 500 learners. Then, in the year 2003, China offered Business subject through radios, websites, and mobile phones with over 4 millions learners.

The word “MOOC” was introduced in the year 2008 by Dave Cormier from the University of Prince Edward Island. He uses to provide Arts subjects that were taught by George Siemens from Athabasca University in Canada and Stephen Downes from National Research Council. At that time, there were around 25 learners that paid for their fees from Manitoba University and 2,200 learners who take courses for free. Additionally, the courses can be found from “RSS Feed = Really Simple Syndication” and communicate through “Blog = Weblog”, and conference through Moodle and Second Life. From New York Times which published on 14 November 2012 and educationdive.com website mentioned that 2012 was “the Year of the MOOC” with the fact that many famous universities invested with MOOC system developers, such as Khan Academy, Udacity, Coursera, edX, Eramus, AcademicRoom, and Udemy.

III. KHAN ACADEMY

From Wikipedia [7], Khan Academy is a non-profit educational institute which was introduced in September 2006 by Salman Khan, an American man born in Louisiana. Khan was graduated 3 degrees from Massachusetts Institute of Technology which are Bachelor of Science in Mathematics, Master of Science in Electrical and Computer Engineering, and Master of Science in
Electrical Engineering and Computer Science and graduated Master of Business Administrators from Harvard University.

In late 2004, Khan taught Mathematics to his cousins named “Nadia”. After that, other cousins and friends had asked Khan to teach them. So, Khan decided to make videos of his teaching and uploaded through Youtube. He found that there were many people interested in his teaching videos. There was a venture named “Connective Capital Management” contacted to invest and build up a non-profit educational institution named “Khan Academy”. After a while, Khan Academy got invested more from different organizations, namely, Bill & Melinda Gates Foundation and Google.

In the year 2010, Google announced to invest over 2 millions US dollars (or 64 millions baht) to produce more subjects and translate them to different languages.

In the year 2013, Carlos Slim Foundation in Mexico invested to support Khan Academy to produce Spanish videos. There were 458 millions views for Khan Academy videos compared to “OpenCourseWare” from MIT which had only 67 millions views. For the number of members, Khan Academy had 2 millions members higher than OpenCourseWare from MIT.

In July 2014, Ministry of Education in the United States used 3 millions US dollars (about 96 millions baht) for surveying efficacy of Khan Academy which has been translated the content into around 65 different languages. There are many subjects provided through Khan Academy [8]. Here are the 10 examples of subjects from Algebra courses:

- Algebra 01: Simple Equations
- Algebra 02: Equations 2
- Algebra 03: Equations 3
- Algebra 04: Algebra Linear Equations 4
- Algebra 05: Solving Inequalities
- Algebra 06: Algebra Graphing Lines 1
- Algebra 07: Algebra Slope and Y-intercept Intuition
- Algebra 08: Algebra Slope
- Algebra 09: Algebra Slope 2
- Algebra 10: Algebra Slope 3

Anyone can suggest their courses to provide in Khan Academy. However, Khan Academy has experts to consider whether to produce those suggested subjects or not.

IV. UDACITY

UdaCity [9] is a profit educational institution which was created on June 2011 to provide education like MOOC which provided courses mostly from universities. After that, it changed to focus on vocational education. The founder of UdaCity was inspired by Stanford University when they offered free Computer Science course for learners around the world.

The first subject that Stanford University provided was “Introduction to Artificial Intelligence” which had 160,000 interested learners from different continents. UdaCity got money for investment from venture capital firm and private money from the founder “Sebastian Thrun” for around 200,000 US dollars (about 6 millions baht).

In October 2012, another venture capital firm named “Andressen Horowitz” invested 15 millions US dollars (about 320 millions baht). On 28 April 2014, UdaCity has about 1.6 million users in different courses which separated to 12 paid courses and 26 free courses.

The first subject provided by UdaCity was “Building a Search Engine” which was taught by David Evans from University of Virginia. The second subject was “Programming a Robotic Car” which was taught by Sebastian Thrun who was a founder.

On 16 April 2012, UdaCity opened another 4 subjects and another 5 subjects on 31 May 2012. Some subjects were not included in Computer Science courses.
On 23 August 2012, UdaCity offered Entrepreneur course and other subjects. After that, on 15 January 2013, UdaCity announced to corporate with San Jose State University which offered 2 Algebra subjects and 1 Statistics subject. The learners are able to receive their credits at San Jose State University. However, more than half of the students failed the exam, so the project needed to be shut down.

In June 2014, UdaCity announced to corporate with AT&T Company to offer Programming courses without credits but it’s complementary for people who would like to work with AT&T Company. From UdaCity website [10], there was an announcement that UdaCity knew which subject needed to offer for Computer’s Companies, such as:

- Data Analyst
- Intro to Computer Science
- Machine Learning
- Introduction to Data Science
- Introduction to Statistics
- Introduction to Descriptive Statistics

V. COURSERA

From Wikipedia [11], Coursera is a profit educational institution which was introduced in the year 2012. The founders were professors from Computer Science at Stanford University namely, “Andrew Ng” and “Daphne Koller”. Coursera corporated with many universities to create MOOC system, such as:

- Physics
- Engineering
- Humanities
- Medical Sciences
- Biology
- Social Sciences
- Mathematics
- Business
- Computer Science

There were Apps provided for the learners to study both in iOS and Android platforms.

In October 2014, there were over 10 millions users and 839 subjects from 114 institutions.

In September 2013, Coursera announced that they will charge for the certificate to all graduates and Coursera received around 1 million US dollar (about 32 millions baht). In December 2013, there were an investor offered 85 millions US dollars (about 2,700 millions baht). Coursera deducted 20 percent of the revenues as the profit. For the rest of the money, they shared to universities that accepted their credits as well as for the cost of working process.

In January 2013, Coursera announced that “ACE = American Council on Education” accepted 5 subjects from Coursera to universities.

The first subject is “Algebra” from University of California, Irvine. The second subject is “Introduction to Calculus” from University of California, Irvine. The third subject is “Introduction to Genetics and Evolution” from Duke University. The fourth subject is “Bioelectricity” from Duke University. The fifth subject is “Calculus: Single Variable” from University of Pennsylvania.

From Coursera website [12], there were many examples of subjects that corporate with different universities.

- The first example is “Internet History, Technology, and Security” which corporate with Michigan University and taught by Charles Severance.
- The second example is “Advanced Chemistry” which corporate with Kentucky State University and taught by Allison Soult and Kim Woodrum.
- The third example is “Financial Engineering and Risk Management” which corporate with Columbia University and taught by “Martin Haugh” and “Garud Lyengar”.
- The fourth example is “Cryptography” which corporate with Maryland University and
taught by Roger Peng, Jeff Leek, and Brian Caffo.

- The fifth example is “International Organizations Management” which corporate with Johns Hopkins University and taught by Brian Caffo, Jeff Leek, and Roger Peng.

VI. EDX

From Wikipedia [13], edX is a non-profit educational institution by using open software. edX was introduced on May 2012 by Massachusetts Institute of Technology and Harvard University. There are many institutions and international organizations that help edX to manage providing education over 60 places.

On 22 October 2014, edX has more than 3 millions learners over 300 subjects. In the process of learning at edX, the learners will watch videos and homework will be assigned through videos. Also, there will be extra lessons videos provided in many educational institutions. Also, there are e-books and forums available for learners to give suggestions and opinions to each other as well as communicating with teaching assistants. For the subjects that need laboratories, edX will provide online laboratories for them, for example, in Electronic Circuit subject, learners are able to design their own virtual circuits through online laboratory.

Graduates will receive certificates which can be used to transfer for credits in universities. Learners are allowed to audit the subjects they are interested without paying or pay for the certificate after graduating each class or pay for 3-4 subjects in one certificate. Universities and institutions that corporate with edX are:

- Stanford University
- MIT
- Harvard
- UC Berkeley
- University of Queensland
- Google

From mooc-list.com [14], this section will provide 5 examples of subjects that offered from edX, such as:

- The first example is “MCB 80.1x: Fundamentals of Neuroscience, Part 1”, which is self-paced where learners are able to select their study time.
- The second example is “CS50x: Introduction to Computer Science” which is also a self-paced subject.
- The third example is “UT.5.02x: Linear Algebra”.
- The fourth example is “HLS1x: Copyright”.
- The fifth example is “CS169.2x: Software as a Service”.

VII. ERASMUS

From the article titled “Does Europe need its own MOOC?” [15]. In May 2012, the media reported that MOOC system from Europe would be introduced named “Erasmus”.

MOOC system from Europe must have their own brandname where they should have certificate and clear business models to attract learners from around the world. Also, the system should allow student to select their courses from MOOC and the courses should come from different universities. There was a report that in the year 2015, Europe will lack of Information, Communication and Technology professionals up to 700,000 people. Those positions should be occupied by European people who gain knowledge from MOOC system in Europe.

In addition, MOOC in Europe offers live long learning for European people and everyone in the world. There was an opinion that MOOC in Europe would not be good enough if the universities in the United Kingdom don’t support their education.

In May 2012, Prof. Arie K. den Boon from Digital Media Course at Amsterdam University [16] had gathered people to start developing MOOC in Europe without having
any budget. After that, universities provided funds and budgets to: 4 staff for MOOC production, 4 staff for editors, 1 designer, and 1 project manager.

Erasmus was arranged to open the first semester in February 2013 which would be similar to MOOC system. Erasmus was opened by Prof. Boon who had experienced on MOOC by registering to study at Udacity and cooperating with Coursera. The committees worked really hard on developing MOOC system.

VIII. ACADEMICROOM

According to the article from Pascal Observatory [17], professors from Harvard University have started developing MOOC and aimed to produce over 10,000 subjects.

In the year 2014, there are many subjects available through AcademicRoom as follows [18]:

- Humanities
- Social Sciences
- Physical Sciences
- Life Sciences
- Healthcare
- Professionals

The five examples of subjects are given below:

- The first subject is “Introduction to the Solar System”
- The second subject is “Business Skills for a Data Scientist”
- The third example is “Introduction to American Studies”
- The fourth example is “Search Engine”
- The fifth example is “Introduction to Problem Solving and Programming”

IX. UDEMY

From Wikipedia [19], in the year 2007, “Eren Bali” from Turkey has developed software for teaching. He found out that there were many people interesting so he moved to Silicon Valley, California, United States to open a company in the year 2009. After that, another two founders of the company were “Oktay Caglar” and “Gagan Biyani”.

In the year 2010, the founders invested for 30 times but not success. However, 3 of them still announced about their service named “The Academy of You” or in short “Udemy” in May 2010. For around 2-3 months, Udemy gathered about 1,000 professionals to develop about 2,000 subjects and there were about 10,000 learners. As many people were interested, the founders tried to invest again. There were investors offered around 1 million US dollar (30 millions baht) in August 2010. The budget received was higher than expected.

In October 2011, the investors from different places offered in the total of 3 millions US dollars (about 90 millions baht).

In October 2012, the investors offered again 12 millions US dollars (about 360 millions baht). The total amount of funds was 16 millions US dollars (about 480 millions baht).

In May 2014, Udemy got more funds from investors with the total of 32 millions US dollars (about 960 millions baht). Udemy allows instructors and teachers who are interested to open their own courses by using software and hardware from Udemy.

The creators are allowed to upload videos, powerpoint presentations, pdf files, and real-time teaching on website. Each instructor is allowed to communicate with their students through webboards. However, in the year 2014, there’s still no institution accept the credits from Udemy, even there are over 4 millions learners and over 20,000 subjects available. There are instructors and owners of the subjects over 10,000 people. There are 10 millions registration through Udemy. The total of videos provided for Udemy is longer than 3.4 millions minutes and more than 53 languages available.
X. MOOC FOR DEVELOPMENT

From the article posted on 15 July 2014 from Institute of International Education, which is one of the biggest international educational organization in the world, considered 5 questions about MOOC for Development [20].

The first question was “Does the network infrastructure is enough for supporting MOOC in the developing countries or not?”. In many developing countries, both in urban and rural areas still have unstable electricity to use. Therefore, it leads to unable to use internet as well as MOOC efficiently. 20% of the world’s population or around 1,200 millions people still don’t have electricity to use. From that number, about 50 millions people are in Africa and over 400 millions are in India. Also, in some places, there are internet for students, but the accessibility is really slow that cause the incapability of downloading and uploading information.

The second question was “Is it appropriate to use MOOC for the non-formal education in the developing countries?”. In the developing country like India is able to use MOOC system in the non-formal education, especially for women studies and citizens in slum. So, the answer is that MOOC is appropriate to use for non-formal education.

The third question was “Would MOOC help to reduce the gap between gender in education or not?”. In developing countries, there are less education offers for women than men. So, MOOC is a suggestion to reduce the gap mentioned. For example, in the countries that don’t support women to study at the college, MOOC could be the solution to those women to study at home. However, there’s an argument complaining that MOOC should not be used to replace studying at college.

The fourth question was “Would MOOC change the role of teachers?”. There were some comparisons saying that teachers from MOOC are like primary care physicians where it should be specialist. Therefore, teachers who are teaching through MOOC should corporate with MOOC developers that create MOOC for their subjects. However, there is another comment suggesting that MOOC could help private educational institutes in the developing countries that do not have specialists in the college are able to use MOOC to teach different courses provided by famous universities around the world.

The fifth question was “Could courses from MOOC which can be accessed all over the world be suitable for different areas?”. In order to bring MOOC from developed countries to be used in developing countries or undeveloped countries, MOOC should be adapted to make it suitable for different culture.

XI. MOOC SEMINAR THROUGH MOOC

On 5 September to 12 October 2014, the organization named “COL = Commonwealth of Learning” [21] which has members from 50 countries with the total of 1.7 thousand million people had arranged seminar with Indian Institute of Technology Kanpur. The seminar was about MOOC and organized through MOOC [22]. There were about 2,342 people participated in the seminar from 92 countries. The highest number of participants for the top 5 countries were India, Nepal, Mauritius, South Africa, and Canada. But, the most active participants were about 1,900 people. Most of the participants were instructors from higher educational institutes and some of them were students. The organizations that arranged this seminar were COL, Google, Microsoft and Indian Institute of Technology Kanpur. The conference is still organizing through forums in the internet for 6 months. The objective of the seminar was to promote that MOOC could be developed from developed countries to make it appropriate for developing countries.

XII. WHAT THAILAND SHOULD DO ABOUT MOOC?

As MOOC system is really important in the present days, Thailand should start setting up the committees considering about what should
we do about MOOC. The House of Parliament had already set up the committees to draft the proposed of eLearning Law.

MOOC system also as important as eLearning, therefore, people should consider it seriously. For example, following Khan Academy where they uploaded teaching videos through Youtube or corporating with many popular universities to develop new course and select specialists to be professors and instructors through MOOC. At each institution, if MOOC is offered for students, they are able to study some subjects from the specialists. Also, they don't have to waste their money on buying textbooks that they never read. However, students might be interested in reading and sharing opinions about each subject through social media.

XIII. MOOC TRAINING

From Hands-On ICT website [23, 24], there are many articles presenting about the ways to train MOOC developers. The examples will be presented in this section.

The first example was posted on 29 October 2014 where there were 2,700 people joining MOOC and 30% selected English subject. To start with, the learners have to watch videos about the syllabus and course description and the introduction how to use MOOC system. Also, it provided chances for learners to introduce themselves to other people through MOOC for the first class.

The second example was posted on 24 October 2014 where there were 2,200 people from 120 countries. In this training, the participants will study in the topic of “Design Studio for ICT Based Learning Activities” which was about designing and using technology to develop MOOC in their own ways.

The third example was posted on 16 October 2014 where the MOOC training was organized through Facebook. For people who are interested, they can follow the page to find out more tips and features about MOOC.

The fourth example was posted on 9 September 2014 which was the first time that trained MOOC in 7 languages at the same time.

The fifth example was posted on 6 October 2014 which was the workshop in London. This activity was organized by Hands-On, Learning Designer Community, and Creative Digital Solution.

This training allows the participants to join online and trying to design their own teaching style by using different techniques provided from the organizers.

XIV. MOOC SEMINARS

Searching through Google “MOOC Seminars and Conferences” [25]. There were over 3,150,000 entries shown. Here are the examples from the entries.

The first example was from educause website where it organized “Webminar” (seminar through websites) for the participants to study about quality matters for MOOC that developed from people and developers.

The second example was from 10times.com which organized seminar about MOOC in the year 2013 at Melbourne, Australia.

The third example was from academia website which was organizing seminar about using MOOC to be media for teaching Arts.

The fourth example was from slideshare website which was the example of the article presented in the topic of “MOOC and Digital Humanities”.

XV. MOOC JOURNALS

Searching from Google “MOOC Publications and eBooks” [26] There were over 4,680,000 entries shown. The examples will be presented in this section.

The first example was from Amazon website which sells an eBook named “MOOC Yourself” for people who are interested in creating and designing their own MOOC.
The second example was from Cetis website. There were publications provided named “Beyond MOOCs: Sustainable Online Learning in Institutions”. This publication provides the examples of courses and subjects offered through MOOC.

The third example was from Parlor Press which also provided eBooks about “Invasion of the MOOCs” which describes the main roles of MOOC and change in aspects about teaching and learning styles.

The fourth example was from eLearnspace website which also provided publication about MOOC in the topic of “MOOC Model for Digital Practice” which has explained about efficacy of the use of MOOC for digital process.

XVI. MOOC LEARNED SOCIETIES

Searching from Google “MOOC Learned Societies” [27]. There were over 174,000 entries. The examples will be given in this section.

The first example is “SoLAR = Society for Learning Analytical Research” which is the society for international research for interdisciplinary.

The second example is “American Council of Learned Societies on MOOCs” which is the society that organized the conference and training about MOOC in many universities.

XVII. CONCLUDING REMARKS

As MOOC becomes really important in the present days, people in the education industry should consider more on MOOC to provide better education to the new generation. Especially in the developing countries and undeveloped countries should ask for help to start developing MOOC for their own country. The information about MOOC could be easily found in the Internet. Therefore, everyone should find out more about it and develop them for the future use.

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