MOOCs Integration in the Formal Education

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Abstract

At the beginning, we believed that MOOCs were going to change the education methods and approaches all over the world especially in the primary education and it would be a stand-alone learning experience, however what's really happening right now is slightly different. According to researches, new trends have appeared among MOOCs users like: MOOCs users belong to the young generation ages between 18 and 40 years old, not to mention that most of them are graduate and post graduate students. They have a good education background and their parents are likely have so. On the other side, MOOCs disadvantages have become more obvious: the high drop-out rates in courses, the questionable true evaluation of student understanding, and the lack of formal certificate or credit hours transfer option for students.

At first, formal education institutes look to the MOOCs as a type of self-learning or a stand-alone learning experience that can't add much to the formal type of learning that they provide to their students. Lately, that wasn't the case. New trials and models have been emerging slowly over the time as a combination of MOOCs with formal education. MOOCs have been integrating repetitively and in a different ways in the formal education. These trials and models are trying to get both MOOCS advantages and at the same time to increase education quality.

This study discusses how MOOCs have become over time part of the formal education and how likely this is going to developed in the future.

1. Introduction

Great expectations were put in MOOCs at its startup. MOOC builds on the active engagement between several hundred and 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 [2].

The first impression was that MOOCs could be used as a separate tool separated from the formal type of education to spread education. Nothing has more potential to lift, more people out of poverty. Nothing has more potential to unlock a billion, more brains to solve the world's biggest problems…than the massive open online course [8]. But this wasn't the case. First, we will explore what have happened with MOOCs during its evolution from the early stage of startup till now, what are MOOCs student profile? What are the main disadvantages that emerged during MOOCs evolution? .Then, We are going to explore trials and models that that have been developing to overcome MOOCs disadvantages and to use MOOCs in a more effective way especially those ways and methods that mixing MOOCs with the formal education. Finally, we will discuss how likely this combination are going to evolve in the future and what challenges it might face.

2. Trends in MOOCs student profile

At early stage of MOOCs startup, we thought that MOOCs will "allow people who lack access to world class learning…an opportunity to make a better life for themselves and their families" [7]. There were great hopes that MOOCs could be used on a wide scale to spread education especially for those who lack access to it either due to their low socioeconomic status or due to physical absence of schools. We hoped that MOOCs would be an alternative tool for spreading primary education in the developing countries. But as the years go by, it appears clearly from observations and trends that these hopes aren't completely correct, and new realities appear instead.

If we look at the supply, MOOCs are growing steadily: with more than 2000 MOOCs courses made available by January 2015. But in the demand side, new trends become prominent and consistent in many studies.

These trends have become more obvious in student profile and in the education process. For the latter, many of them are hindering students and education institutes from making best use of MOOCs during education process.

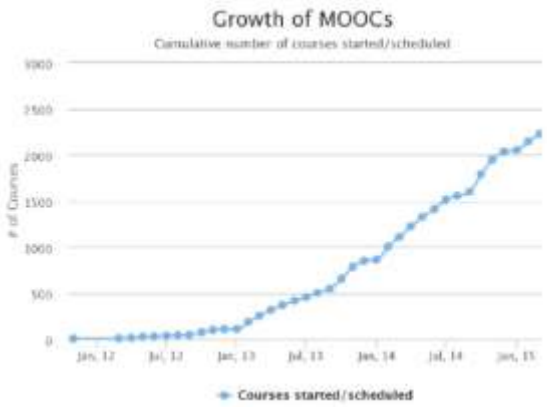

Figure 1. Growth of MOOCs [21]

2.1. Trends in MOOCs student profile

Many researches have been done recently trying to explore MOOCs user characteristics but still further researches are needed. In this section we have chosen 5 criteria that can give us a good impression how MOOCs user profile looks like.

2.1.1 For age. In Pennsylvania study Over 40% of MOOC students are under 30 years of age. [4]. in another, as seen below, about 66% of the student are aged between 18-35 years.

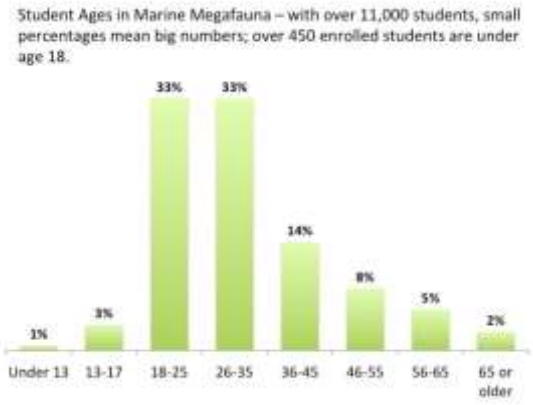

Figure 2. Students Aged 9 to 65+ Study PLOS Research in Marine Megafauna MOOC [15]

In another study, the average age of the participant was 34. [10]

2.1.2 For education. In a study conduct by Pennsylvania University on student enrolled in 32 MOOCs it offered in Coursera platform it concluded that the students who have participated in MOOCs thus far appear to be predominantly highly educated and employed, [4]. In details, it found that MOOC students have very high levels of educational attainment: 83.0% of students have a post-secondary degree (2 or 4 years), 79.4% of students have a Bachelor's degree or higher and 44.2% report education beyond a Bachelor's degree. [4] Also, in another study in a more niche course it concluded that Most of the students in Marine Megafauna (Name of the course) are also students elsewhere – 42% are currently enrolled in some type of educational program. [12]. lastly: Almost three in four (74%) UW-Madison MOOC participants have a bachelor's degree or higher [10].

A final thought should be mentioned here, as we have seen, most of MOOCs student are in the graduate and postgraduate studies. On one hand, they have a good education background before taking these courses. On the other hand, we can expect that some of them use these courses with their formal studies which they take in their education. Indeed, as we will see in next section, this combination between MOOCs and formal study has a positive impact on completion rate and education quality.

2.2.3 Parents education. A study done by 2 researchers from Harvard University comparing between HarvardX adolescent population who were registrants at 9 Harvard courses on Edx platform from September 2013 to June 2014 comparing them to U.S population. They found that "Parental education is also associated with a higher likelihood of MOOC enrollment. For instance, a seventeen year-old whose most educated parent has a bachelor's degree is more than five times as likely to register as a seventeen year-old whose most educated parent has a high school diploma [20]. A similar study in developing countries would be useful to generalize these results but still this study gives us an indicator about parent education impact on MOOCs user profile.

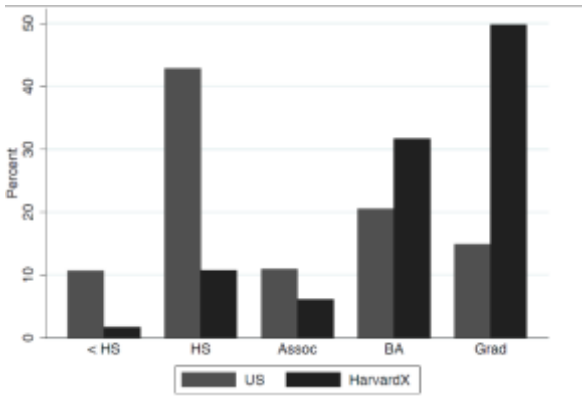

Figure 3. Parental educational attainment among 13-17year olds, for all U.S. non-institutionalized residents and 2013-2014 HarvardX registrants [16]

2.2.4 Countries "EdX states that about 48% of its students come from developing countries, 12% of that population from India [18]. In the above diagram, we can notice that 28% of the respondents are coming from United States. A result that conform another study result which concluded that only one

quarter (23%) of UW-Madison MOOC participants are from the United States [10].We should notice here that most MOOCs are offering in the English language, a factor that could have impact on these results, and offered by platform from English speaking countries.

Figure 4. Edinburgh study [22]

2.1.5 Languages. As we have seen so far, languages have indirect impact on type of MOOCs User. In the supply side: Courses are currently being offered in 13 different languages, and 80% of courses are taught in English [17]. Meanwhile, in the demand side proficiency in English has effect on the quality of education that student gain: Of the students who earned distinction, fluent students were a larger percentage and beginner students were a smaller percentage compared to all non-native English speakers that answered the question. Although our results suggest that a student's proficiency in English does influence their likelihood of earning distinction, the proficiency of the group of students who passed the course without distinction was very similar to the proficiency of all students who were under that study [5]. This is a good evidence that proficiency in the English language has a direct impact on the quality of education favoring students from English speaking countries or who have a good proficiency in English during their previous education than others.

I tried by this exploratory approach to gain insights about MOOCs user profile. Challenging the idea that MOOCs would help more the underprivileged students who lack the access to the education or students with low financial status or socio-economic background. In reality, what seems to be happening is that: MOOCs helps the privileged graduate student with good educational and academic background. In developing countries MOOCs helps the students with adequate levels in English language as most of the courses offered are in English and not all of these courses have translations or subtitles to the local language of the student. Also, MOOCs help young age student who have a good educational background and their parent have a good education background. Causes and Explanation of these results may need further studies to confirm these results in different countries and follow them over time to make sure that these results are persisting. However, at the end of the day, we have a good picture right now about MOOC user profile.

2.2. Trends in MOOCs education process

Andrew Ng is an associate professor of computer science at Stanford "I normally teach 400 students," Ng explained, but last semester he taught 100,000 in an online course on machine learning. "To reach that many students before," he said, "I would have had to teach my normal Stanford class for 250 years." [6]. at the beginning there were many hopes on MOOCs especially within university professors Dr. Agarwal predicts that "a year from now, campuses will give credit for people with edX certificates." He expects students will one day arrive on campus with MOOC credits the way they do now with Advanced Placement [19] but this isn't the case right now. Professor Sebastian Thrun the cofounder and CEO of Udacity - one of the MOOCs platform - said about his company last year that it is a" Uber for Education"[3]. Far from what was expected!

By the time, we have discovered that there are many challenges during MOOCs education process that we have to deal with. Lake of interaction between the instructor and student, large gaps between students in the same course…etc. In this study, we have chosen 3 factors that might have great contribution for emerging models of integration between MOOCs and formal education. Other factors are still important, but these factors, we have chosen, have had a negative impact at the beginning but it turns out later to change the course of MOOCs education process.

2.2.1 High rate of drop out. The average MOOCs enrollment is around 43,000 students, 6.5% of whom complete the course. Enrolment numbers are decreasing over time and are positively correlated with course length. Completion rates are consistent across time, university rank, and total enrolment, but negatively correlated with course length [12]. The data updated till 12th June 2015 shows that the current average completion rate for MOOCs is approximately 15% [13]. The majority of students (84%) who accessed the course did not complete any of the exams. 11% of students completed at least one part of an exam but did not complete all of the exams [5].Large numbers of enrollment in MOOCs are announced at MOOC s platform with the beginning of each course. These numbers are bigger than any course program enrolment in most of worldwide universities, raising questions about quality of education and how can we manage education process without almost no direct interaction? to what extent the process of education is efficient with these huge numbers?, etc. These questions – and other – affect the perception of MOOCs in most universities. To a large extent it is seen by most of formal education

institutes as a complementary non-obligatory materials with great suspicions in its value.

In a research paper titled" Context counts: How learners' contexts influence learning in a MOOC" the study examine how student current role and context influences their MOOCs study [16] The study reaches to conclusions, give us a deeper understanding of MOOCs learning experience, showing that learning context, familiarity with the course content and studying for the higher education play a positive role in learning experience. (Whilst incorporating elements of traditional, formal higher education, MOOCs also facilitate flexible learning, requiring individual participants to choose how, when and in what ways they engage. Connecting the learning occurring on MOOCs to 'real-world' contexts and the lives of learners could play an important role in supporting learning" [16] In this regard these factors could be found easily if MOOCs has become part of the formal education. Meanwhile it would reduce the high rate of drop out.

2.2.2 Student assessment. Another problem related to the large number of enrolment: "student assessment" which refers to the continuous process in which we get evidence if students have met course goals and expectations in order to improve their learning [17]. In contrast to formal students, there are big differences between students' levels in MOOCs. There are no prerequisites for MOOCs enrolment nor any previous level of education. As a result, this make student assessment very difficult although there are many methods which are used commonly during courses as student peer reviewed and quizzes. But, still these methods don't gain universities confidence. Consequently, Inefficient Student assessment affects MOOCs accreditation as we will see. MOOCs being part of the formal education would solve this problem as student assessment could be done thorough formal professors and instructors.

2.2.3 MOOC Accreditation refers to the process of giving an online-MOOC student credit or recognition upon completing the course requirements [17]. As a MOOC student, if you have finished any MOOCs course, you need a certificate or accreditation of what you have learned, but even if you take this certificate, its recognition is highly questionable. You can't transfer these certificates to credit hours, and most of the universities or companies don't recognize them. Despite many trial to fix this problem and many calls for innovation as saying that America needs a new, innovation-focused accreditor, Modern States, which would also be recognized by the Department of Education and which could accredit providers of emerging technologies and ideas in order to drive down costs, drive up quality and to shape federal aid programs in new and effective ways [14] but still no final solution for the accreditation problem.

Generally, the average positive public opinion of MOOC is still around 25%. [17] And this is not a high percentage. It is a challenging issue for MOOCs companies to gain universities confidence since this could affect their general perception as well as their profit. On the other side, Student, especially in the developing countries, who MOOCs have helped them a lot in their education hoping to make best use of MOOCs certificate.

3. MOOCs as part of formal education: trials and models

A report released from Columbia university titled "MOOCs: Expectations and Reality" said that While not everyone was certain that MOOCs would persist, many expected them to endure either as stand-alone learning experiences or as the online portion of the increasingly popular flipped classroom model [23]. What happened recently, in many cases MOOCs have become part of formal studies in creative ways which try to maximize the benefits from MOOCs, and in the same time minimize disadvantage.

In the following sections we are going to follow 4 research experiment evaluating new methods and techniques used in different universities and different countries to make best use of MOOCs in the formal education.

3.1.1 San José State University (SJSU), USA. In 2013, a professor of Electrical Engineering at SJSU agreed to pilot the edX online content by using a blended model of online learning--combining the online MOOC content with highly structured, student team-based, in class learning in his course last fall [9]. The study was done for few motivation, among them to increase educational quality and to increase student typical passage rate in the course. The course was designed with three distinct activity phases across the 15-week semester: (1) online outside-of-class elearning.
(2) in-class, F2F, team-based learning; and
(3) after-class follow up activities. [9]

A notice should be mentioned here, in this trial still the starting point was teacher centered model and how to increase its quality. Indeed, almost the same content of the course was delivered without big changes except in the way of delivery which became mixed between face to café interaction in the formal classes and using MOOCs before and after classes to achieve trial goals.

According to the research, a good results were perceived, for example:
- For the last three years, the success rate for this class has been 65% when taught traditionally. However, with the blended model using the edX

MOOC, the success rate increased to 91% (or improved by 26%) [9].

WHAT DO YOU LIKE MOST ABOUT THE FORMAT OF CLASS?

Access to resources online	55%
Ability to go over material at own pace out of class	47%
Group work/quizzes	40%
Lectures available online	33%
Professor and TA availability to help	23%
Able to do assignments/problems in class	17%
Quizzes make students become more prepare	12%

Figure 5. Student most liked aspects of the new course format [9]

3.1.2 El-Fayoum university, Egypt. Based on the previous example, another study was done in one of the upper Egypt Governorate, El Fayum, titled "A Usability Evaluation of a Blended MOOC Environment: An Experimental Case Study" (Ahmed Mohamed, 2015). In this study, the experiment was based on blending learning between El-fayoum university, Egypt and RWTH Aachen university, Germany by using a bMOOC platform introducing a course in "Teaching methodology". One difference in this study in comparison with the previous one that it tries to deal with some issues that arise from the previous study: (there were some open issues, such as the lack of interaction between students and the video content as well as the lack of integration between the MOOC platform and the campus Learning Management System (LMS). Furthermore, the course was scheduled and led by the faculty professor and the students didn't get the opportunity to engage in a self-organized learning experience. Therefore, they were more involved in the class time activity than the online practice on the edX platform) [1]. Another difference should be mentioned here, rather than focusing on teacher- centered model in the previous study, we focus in this study on learner-centered bMOOCs by providing a bMOOC environment where learners can take an active role in the management of their learning activities[1]. The study mentioned many issues that can cause possible limitations of the MOOCs These include following a teacher-centered and centralized learning model, the lack of effective assessment and feedback, the lack of interactivity between learners and the video content, the diversity of MOOC participants, and the absence of face-to-face interaction and they argued that the blended MOOC (bMOOC) model has the potential to address these issues [1]. In the conclusion of the study they mentioned that the results of the study revealed a general satisfaction with the bMOOC in terms of usability and effectiveness. There was a wide agreement among the participants that offered bMOOC can address the limitations of MOOCs outlined above [1].

3.1.3 Regional alliance, China. In another study titled "The applicable strategy for the courses alliance in regional universities based on MOOC platform "the researchers decide to establish a new model that can promote efficiency and quality of teaching [11] this was done by "Course Alliance "in which they offer courses, in alliance with many universities, suitable for the provinces where the study was done, Jilin province. Chinese MOOC is putting courses on a sharing platform, many colleges students learn the same curriculum, the combination of online learning and classroom teaching form the mixture of teaching methods [11] .Here many noted should be mentioned: china don't allow for the traditional MOOCs platform to be accessed to chinses citizen. Alternatively, another similar platform are working within chinses almost with the same working model. Interestingly, this research was done on a large scale, in comparison with the previous 2 researches, at the university level.it includes many universities, different subjects and large number of participants.

Conducting a survey in 4 collages in the province about the course. Survey results shows that the colleges affiliated by MOE teachers is strong, the experimental condition is superior, rich teaching resources, student work in the national award-winning [11].

3.1.4 A case recommender system, Saudi Arabia . A final interesting study deal with a problem related to the availability of many learning resources and how we can use technology wisely to get best use of these resources. In this research, they propose a system that recommends appropriate MOOCs in response to a specific request of the learner. Using the Case Based Reasoning (CBR) techniques, the system proposes to the learners the most appropriate MOOCs (from different providers) responding to his request [6] Based on the user interest, this new techniques could recommend a suitable MOOC resource for his study. On the other side of the coin, this technique could be used also by the teacher if they would like to recommend MOOC courses for their student, a behavior that becomes common among professors but without in depth research study till now. Similarly, many professors and teachers are using MOOCs as part of homework or requested assignments from students. In some cases, student would get official marks from his\her teacher after successfully completing MOOC course. In either cases, those experiments are still under implementation and no evaluation has been done for them.

5. Conclusions

In this study, we try to explore how MOOCs student profile would emerged according to

quantitative studies have been done recently. New trends and observations could be noted although still further studies are needed. To a large extent, MOOCs are more common between the privileged student rather than disadvantaged students. On the other hand, there are many disadvantages that could be noted, like high percentage of drop out, inefficient student evaluation and lack of MOOCs accreditation. These disadvantages affect MOOCs image and perception especially among universities.

In response to these finding, there are many trials to integrate MOOCs inside formal education. This would open a new way for MOOCs developing not as a stand-alone learning experience, as it was thought in the past, but rather as a new way for integration between personal learning based on personal capabilities and formal education characterized by more serious discussions, better student evaluations and accreditations of study. In these trials, we see that they come from different countries with different methods and models. This is likely going to be persist in the future by different forms. Not to mention, it is liable for more evolution and maturation.

In the light of these trends, many research gaps need to be filled, like what are the other forms of MOOCs integration used commonly in the formal education? In developing countries, will these new models increase education quality with less financial resources? Could these new models open a gate for cooperation between many universities in credited accreditation? For example, could a university in developing country make a MOOC course from a highly ranked university an official course in local university\ institute with supervision of their formal professors and at the end of the year students take a credit hours from the high ranked university? Indeed, Many areas still need more investigations to answer questions like: How this new trends could affect MOOCs business model? How this going to affect MOOCs platform\Companies positively or negatively?

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