# MOOC Effectiveness and Efficiency

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***Abstract*** -The purpose of this study is to measure the real efficiency and effectiveness of MOOC by focusing on the two major MOOC providers: Coursera and edX in terms of history, expansion, specifications along with limitations. This paper is survey-based and the quantitative method is employed in which the data gathered from questionnaire that were asked users via web. The sample of the study is MOOC learners on Coursera and edX from around the world. Massive open online course (MOOC) started in 2008 but since 2012, it attracts many universities, media and entrepreneurs. Experts anticipate that MOOC can change the world by 2022. MOOC is an online course with the aim of integrated access and free education via the internet which it allows individuals to take courses without any limitation of space and time. MOOCs create a community for the students and instructors by providing interactive forums. With the high speed and increasing growth of online learning, the quality of MOOC as an online learning provider is important and mostly only pay attention to the development of online education.

***Keywords*** – MOOCs, Online learning, Coursera, edX

## I. Introduction

MOOC is a newfound technology in the world of ICT which is the abbreviation of Massive Open Online Courses. It is Open (Everything is available by anyone joining the course), Participatory (everyone can learn by working with other participants), Distributed (all the course material such as videos, blog posts, links, tweets can be shared together) and it also supports lifelong learning [3]. The massive open online course provides an opportunity for people to take their favourite courses virtually and via the internet rather than physical attendance at the classroom. The courses include all types of topics which are provided by various colleges and institutions. An MOOC can gather those experts and professionals who have the common scientific interests and look for the ease of education [5].

There are a large number of MOOC providers around the world including Coursera, edX and so on. Coursera and edX facilitate the exchange of information and communication between the students and instructors. Since both Coursera and edX are the pioneers of MOOC with the same platform as well as they are recognized as the most popular MOOC services from learners' opinion, in the research, it is intended to focus on these two providers.

The main objective of this study is to get information and data collection from those learners who have had the learning experience of two platforms of Coursera and edX. In the research, we discuss the different features of these MOOC providers. This survey attempts to help the development

and the ease use of MOOCs by in–depth understanding of the strengths and weaknesses points of MOOC services.

## II. Expansion of MOOCs (xMOOCs & cMOOCs)

There are two categories of MOOCs: xMOOCs and cMOOCs. Edx and Coursera are the Instances of xMOOCs. In this kind of MOOC, there is time limitation with an instructor who classifies and arranges the courses. Also, xMOOC are grade-based and people who take the course successfully, they can get a certificate. On the other hand, cMOOCs learners can participate with each other and engage with the course materials in an informal environment without neither tutor nor test. All types of Forums and Blogs are the samples of cMOOCs [3].

As mentioned, due to the popularity of xMOOC providers, in this research, Coursera and edX will be investigated.

Coursera is a for-profit company, founded by Stanford University professors, Andrew Ng, and Daphne Koller. It was launched in April 2012 and has over 100 partners, 500 plus courses, approximately 7.5 million students [6]. It is the largest MOOC service in the world. edX is a nonprofit enterprise and an open-source software platform, founded by Harvard and MIT University. edX was launched in May 2012 and has 55 partners, 300 plus courses, and approximately 2.3 million students [7]. According to studies in the literature, the vast majority of learners are from the United States with 38% learners and China with 34% students and then Brazil and India with just a total of 11% users. Canada and European countries are placed at the next positions of this classification [8, 9].

## III. Specifications

There are no financial barriers in the use of MOOCs unless the participants are going to get a degree. To participate in MOOC courses, the only thing people need to do is connecting to the internet by means of their computers or mobile devices. In addition, the MOOC courses can be held with different numbers of participants from one person to millions of people from around the world [3].

The brilliant attribute of MOOCs is Collaborative education. All lectures, courses, and materials are planned based on DIYs (Do It Yourself). Even both providers have started offering some game-based courses in order to have more user engagement [4].

Social sites play a major role for a deeper understanding of MOOCs courses. For example, forums environments provide an opportunity for people to the discussion about their problems and take advantages of other participants' knowledge. The discussion forums providing a space for those experts with the common Interests to interact and communicate with each other directly [3].

MOOCs can also develop lifelong learning. It means, regardless people's background, they can enhance their skills and abilities according to their job requirements. For instance, those experts who work on an ongoing project and encounter with some problems, they can get MOOC courses in order to meet their needs [2]. The bright side of MOOCs is no need to have special entry background such as age or level of education. Thereby each person can take the MOOC courses based on his or her needs anytime and anywhere [1].

MOOC providers have had a huge progress in the training of 'Engineering Education'. Optimists believe that MOOCs can act as a key tool for promoting free education in the field of engineering [10]. Engineering Education is the knowledge of teaching the principles of the practical professional engineering in which the laboratories and practice are the key parts of education. Both Coursera and Edx are offered some engineering courses in 2014 [2].

## IV. Limitations

Though MOOCs are observed as an effective method and dynamic way of learning, still there are some problems and limitations around it.

First, the key restriction of MOOCs is they usually offer the course without getting a degree to the learners. Thereby for those learners who need a certificate is not a good option. Furthermore, Dropping out of the courses is a thoughtful issue around the MOOCs. That is why, Organizations, have started offering courses based on new methods and innovation ways like game-based learning to decrease the statistics of the dropped out courses. In addition, some experts believe that students need to go the university and experience the college environment. Hence, MOOCs cannot replace the traditional study at universities at all. [3].

Second, the grading policy is not reliable. As mentioned, since millions of students from around the world participate in MOOC courses, instructors do not have enough time to grade all students' work. That is why, each student should grade other students' work. This method, might be a good solution for easy work but for difficult and professional courses is not. Moreover, cheating is another problem in front of MOOCs. Since there is not strict rules or precise monitoring in MOOC exams, each student can take the exam instead of the others [1, 11].

Third, however Coursera and edX give a degree and certificate for some courses, these kinds of certificates are just worth for that universities offered the courses and are not valid and authentic for other universities or organizations. In the other words, MOOCs certificates are not valuable and reliable as the university certificate [1, 12].

## V. Compare Coursera and edX

Most students are not satisfied with the method of Coursera in taking exams. Because, in Coursera, usually, the quizzes must be answered immediately after finishing the courses. It is not a good feature especially for the students of developing countries with the low-speed internet. Whereas, in the edX, quizzes are always placed at the end of the courses and students can answer them any time without any limitation. Therefore, users believe that edX has the more flexible and more user-friendly method of answering quizzes compared with Coursera [4]. Another point is that the learners' opinion about the video time. Usually, the duration of edX course videos is short (about 10 minutes or less), while the Coursera videos last mostly 35.5 minutes or more. Hence, the students preferred the short time of edX videos as it helped them to continue and keep their concentration during the watching the videos with no distraction [4].

According to the statistical information about which MOOC provider learners prefer to choose, mostly tend to take the online courses on edX [3], however, it needs more surveys to reinforce this claim.

As can be seen from Table1, it is attempted to bring together the findings of some studies in the literature along with the comparison between them about the efficiency and effectiveness of both Coursera and edX. The results is shown in Table 1 below:

Table 1: Literature review regarding Coursera and edX

| | Articles | Comparison | Results |
|---|---|---|---|
| 1 | Learner's Perspective on video-viewing Features Offered by MOOC Providers: Coursera and edX [4]. | The structure of answering quizzes and showing Videos in edX and Coursera is different. | It seems that both Coursera and edX have some strengths and weaknesses points. As it can be seen the testing method in edX is more flexible. Because users can answer the quizzes anytime and anywhere while in Coursera the embedded quizzes should be answered during the course. Also, the short duration of edX videos (10 min or less) is much friendlier for users versus long videos of Coursera (more than 30 min).<br><br>In addition, grading policy in edX is more reliable. Since it is done by an automated software which uses artificial intelligence to grade student tests. While, Coursera grading system is according to peer assessment. As already noted, maybe it can be useful for easy courses but it is difficult for most students to grade professional works. Thereby the accuracy of the grading system in Coursera needs to be considered.<br><br>However, the strongest point about Coursera is the significant growth of offering all types of mobile apps. As users can utilize Coursera apps on their mobile devices such as iOS, Android and Kindle Fire apps. With the increasing development of mobile learning, this feature can be helpful for MOOC participants. Whereas, mobile apps in edX are still under development and cannot support the courses.<br><br>The positive point regarding Coursera and edX is both have had significant progress and reasonable performance in carrying out engineering courses.<br><br>Since game-based learning as an innovative technology will be able to attract a large number of users, both Coursera and edX need to have a special plan on this area in order to appeal more engagement of participants. |
| 2 | Does MOOC Really Work Effectively? [1]. | Coursera grading policy is based on peer assessment in which students should grade other students' works while edX is using automated assessment systems. | |
| 3 | Massive Open Online Course (MOOC): Coursera and edX [13]. | There are a variety of Coursera mobile apps whereas edX Apps still are not available. | |
| 4 | Impact of MOOCs on Engineering Education [2]. | Both Coursera and edX have the same share in offering online education for engineering courses. | |
| 5 | Gamification of MOOCs for Increasing User Engagement [14]. | The two MOOC providers need to focus more on gamified Environment. | |

## VI. Conclusion

As a result, Both Coursera and edX as MOOCs providers play a fundamental role in distance education. These two platforms try to provide a user-friendly environment for learners with the aim of evolution in online learning. However, according to the survey, most students preferred edX cause of its friendlier interface. As it can be seen, with increasing development of the Internet and remote training, everyone can take advantage of MOOCs. At the moment, great numbers of students participate on Coursera and edX courses. But as mentioned, MOOCs have many problems which need to be investigated. The quality of MOOCs including the growth rate of dropping out of courses, the grading system, and many other issues should be taken into consideration. Individuals not only need to the acquisition of knowledge from MOOCs but also, they expect to get an authentic and valuable certificate. That is why, learners are not motivated enough to continue the MOOCs courses and withdraw the courses easily. Totally, although the performance of MOOC is not satisfied enough, it has a significant role in free distance education and system failures can be resolved progressively with the participation of experts and precise analysis.

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