

Open Educational Technology: MOOCs

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Abstract: Replacing education sector with the recent advancements of technology would be one of the most concrete steps towards national development. Massive Open Online Courses (MOOCs) have evolved as a new paradigm of digitized open education which could be implemented in a massive domain of India. MOOC is the technology which is intended to make the education free, uniform and available for all. MOOC is a platform where faculties and subject experts from all universities and organizations across the world come together to teach you the subject of your choice available in the MOOC providers list. In India, 20 million students with 20,000 different courses contributed by 200 top universities and also over 5,000 or more engineering colleges affiliated to different universities, offer conventional and engineering education. Teachers in colleges do the teaching, but universities rigidly control the program of study, syllabus, and examinations. The quality of education is a matter of concern. MOOCs permit learners to access and benefit from the teaching by renowned professors. MOOCs offer an unprecedented opportunity to revitalize education. These cause complete disintermediation of the university system, making them very affordable; however, they have several shortcomings in their present form.

Keywords: Massive Online Open Courses (MOOCs), Online Education, taxonomy, inequality, developing countries.

I. INTRODUCTION

Before the digital age, distance learning appeared in the form of correspondence courses in the 1890s-1920s, and later radio and television broadcast of courses and early forms of e-learning. Typically fewer than five percent of the students would complete a course [4]. The 2000s saw changes in online, or e-learning and distance education, with increasing online presence, open learning opportunities, and the development of Massive Open Online Courses (MOOCs). The special feature of any correspondence or distance education until now has only been the transfer of courseware through online medium. MOOCs have recently received a great deal of attention from the media, entrepreneurial vendors, education professionals and technologically literate sections of the public. The promise of MOOCs is that they will provide free to access, cutting edge courses that could drive down the cost of university-level education and potentially disrupt the existing models of higher education (HE). This has encouraged elite universities to put their courses online by setting up open learning platforms, such as *edX*. New commercial start-ups such as *Coursera* and *Udacity* have also been launched in collaboration with prestigious universities, offering online courses for free or charging a small fee for certification that is not part of credit

for awards. Large corporations such as *Pearson* and *Google* are also planning to move into the HE sector as global players and are likely to adopt a MOOC-based approach as a part of their plans [3].

In this paper section II describes the features of the MOOCs. Section III details the description on differences among MOOCs, campus programs and online programs in education system. Section IV briefs on advantages and disadvantages of MOOCs and discusses the different MOOCs providers in various areas of education. Section V serves as a conclusion of paper for future prospects of MOOCs in education.

II. FEATURES OF MOOCs [1]

The digitization today has brought a revolution not only in the world of electronics and peripherals but also to every possible aspect of human living. MOOC (massive open online course) is a big revolution in the distance learning system of education. With the advent of MOOC, the entire online education spectrum has been revamped and it has become an interactive platform for learners.

MOOC is an education delivery model imparted through the online platform, involving a huge volume of audience with interactive participation rights and open access to every part of learning through the Web medium. Online courses, usually are meant to cater to a limited audience, MOOC on the contrary can handle hundreds and thousands of students at the same time. These free courses involve teaching through videos, reading materials (online), assignments, and interactions with peers as well as the teaching authorities.

The basic features of MOOC involve:

- Handling huge audience
- Free for all (usually)
- Delivered on an online medium
- A curriculum involving professors and real learning
- No limits on attendance

MOOCs are similar to online higher education courses involving reading, watching short lectures, assignments, participation in online discussions and forums etc. The traditional courseware features such as videos, reading material, and problem sets, etc. accompany the above stated features and forum interactions help students build a community of their own to share their knowledge and challenges.

The development in this highly popular system is still on and is expected to continue with collaboration of various MOOC

platforms with top universities willing to support higher education and make it more cost effective for all the stakeholders involved.

MOOC in the coming days will not just remain another online higher education model. It will very soon become the best medium of providing higher education programs for the generation next.

III. MOOC V/S CAMPUS V/S ONLINE EDUCATION [1], [2]

MOOCs are provided by quite a few organizations as well as top universities free of cost. This delivery model became popular, especially because of the confluence of several trends not only in education but also in technology. MOOCs have quite a few benefits. However, before joining a MOOC it is important to compare it with other online and campus programs. Have a look at the comparison given below for MOOCs and other campus and online programs

Table 1. Comparison of MOOCs Campus & Online Mode

MOOC	Campus	Online
MOOC can be taken by anyone regardless of age, ethnicity, financial status, location differences and learning level. All a person needs to get started is a computer and an internet system.	All campus programs across the world have a strict criterion for admissions. Some are related to age and understanding level and some are associated with finance or location criteria.	Although online programs have some criterions for admissions, they are definitely not as strict as campus programs. For instance, for pursuing a Masters program online one needs to have a Bachelor's degree in the required subject.
MOOC is designed to involve a huge number of learners.	A campus program can be extended only to a limited number of students.	Online courses too are designed for a limited number of learners.
These courses are mostly free. Very few MOOCs are chargeable.	Almost all campus programs have a fee attached to them. Also, the fees for campus programs are very high, depending on the popularity of the college/university.	Online programs too have a fee attached to them but are lower than campus program fee.
Since these programs are free and there	People take campus programs more seriously	The dropout rate in online programs is more than campus

are no teachers, directly monitoring the students, a lot of students lose interest in the programs and thus, the dropout rate for these courses is very high.	than a MOOC since they invest a large amount of money into these courses and also since teachers monitor students and give them active feedbacks for the same.	programs but lesser than MOOCs since one opts for an online program when one is really inclined towards pursuing that program.
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MOOCs are one of the hottest topics of discussion today and there are definitely strong reasons for the world to talk about the same. A MOOC platform offers all kind of courses based on one's interest, convenience and time. MOOCs offer a number of benefits to the students, please find a few mentioned below:

- 1) *Reaches out to a huge audience:* The MOOCs model utilizes a technology, which delivers education to a huge audience irrespective of their physical location. MOOC providers can also use any online tools that are relevant to their students, depending on their needs. This whole technology, hence, does not only reduce effort in teaching the same topics over and over again, it also provides online solutions and reduces the time consumed in this whole process of teaching and learning.
- 2) *Free of Cost:* The biggest advantage MOOC courses has over other online courses is that it is free of cost. Students can join any course of their interest and not spend a single penny to pursue the courses from the convenience of their home.
- 3) *No boundaries:* Regardless of the physical location and various time zones of the audience, MOOC has the capability to travel across any geographies and time zones to quench the thirst of knowledge seekers.
- 4) *Flexible timings:* MOOC platforms make it extremely easy and less time consuming for a student to register and commence his/her preferred course. It just needs the students to register themselves and can be initiated immediately after the enrolment is done. Also, a lot of courses in MOOC are self-paced, which give the learners all the right to control the start, speed and end of their course.
- 5) *Knowledge sharing hub:* Learning on MOOC platforms happens in a completely informal environment. The students feel very much at ease and they feel free to share their thoughts and opinions with others without any hesitation. MOOC ends up becoming a platform of knowledge sharing.
- 6) *Option to choose any course:* People interested in learning can cross boundaries of their subjects and take up any subjects to study further. This helps people in gaining

knowledge in as many streams as possible. There is no need of any certification or to get a graduate degree in any particular subject to undertake a MOOC.

- 7) *High level of interaction*: MOOCs are designed in such a way that the participants very soon get into the mode of sharing their thoughts with others. This helps them generate and collate different ideas and create their own content. It incites in them, the skill of creativity and critical thinking.
- 8) *Digital literacy*: MOOCs are online courses and need people to have digital literacy. Hence, people who are digitally not very sound, become tech savvy by the time they have completed one MOOC. It is their eagerness of learning that encourages them to try out the digital platform for learning.
- 9) *Helps build a network*: MOOC helps learners build a huge network by helping them interact with other students. This community of students stays in touch and lasts forever helping each other generate ideas.

IV. SOME MOOCs PROVIDERS [3],[7]

MOOC was initiated with the aim of bringing quality college and university education to the masses.

MOOCs are the biggest upcoming trend in the current education scenario. It has offered an opportunity to all individuals irrespective of his economic background and physical location to pursue his/her education. MOOC is undoubtedly a boon for students interested in various courses, however, there are certain challenges one must be aware of while pursuing massive open online courses. Let's try to understand the advantages and disadvantages [5] of MOOCs:

Advantages:

- 1) MOOCs offer the entire learning community equal rights to education. People can choose from the varied range of programs and enrol for the course of their choice from the convenience of their homes without spending a dime. Although students study independently in these courses, they at the same time collaborate with their peers from different parts of the world.
- 2) MOOCs are a boon for people who have faced obstacles in pursuing education due to lack of funds, no proper opportunities, un-accessible geographical location, etc.
- 3) Pedagogically, MOOCs are designed to be extremely interactive. It uses all the interactive media available on the internet to engage students. The various tools used are blogs, videos, podcasts and forums that are embedded into the programs seamlessly. These tools collaborate learners and help them solve real world problems rather than discussing hypothetical material. Real discussion of ideas, theories and concepts are an integral part of a MOOC and are used for peer review and assessment.

Disadvantages:

Although MOOCs offer a lot of advantages, there are still some grey areas in MOOC that need to be addressed. In

MOOCs, the teachers and professors deal with a huge audience, as a result, they are unable to give active feedbacks for assignments and tests to the students.

Moreover, at times if the professor taking the course teaches it in an uninteresting way or the students find the classes boring, there is absolutely no way one can interact with the faculty to give feedback. There is no way teachers can interact directly with students and engage them.

Overall, MOOCs has its pros and cons and with time all MOOC providers are trying to reduce these disadvantages by offering several incentives to the students, some of the popular MOOC providers are:

- 1) *Coursera* - Coursera is an educational technology company and one of its kinds to bring the concept of MOOC to the world. Coursera partners with top universities and organizations around the world to offer online courses for anyone free of cost. It was founded by Daphne Koller and Andrew Ng, who were employed as professors at Stanford University then. Coursera offers MOOCs in the streams of Humanities, Medicine, Biology, Social Sciences, Mathematics, Business, Computer Science, and many others and holds the highest rank in MOOC providers by covering maximum number of subjects. The courses on Coursera are very informative and descriptive and use video lectures as their basic medium. A lot of courses offer options to display subtitles in languages other than English. Almost all of the courses provide a certificate after completion of the course. A peer review system is followed for courses such as humanities & social sciences and their related assignments, since an objective standard review may not be applicable there.
- 2) *UDACITY* - The second best player in the MOOC spectrum is UDACITY. The company operates with the belief that higher education is a basic human right and runs on a mission of bringing accessible, affordable, engaging and highly effective higher education to the people of this world. It is a for-profit organization and unlike MOOC, it offers courses for an affordable fee. The fee is very nominal when compared to the whole curriculum fee, a college or university charges. UDACITY, initially covered subjects such as computer science, engineering and mathematics. With time, there were a whole range of new subjects that were added to the list. A specialized course on Entrepreneurship presided over by retired serial entrepreneur Steve Blank gained a huge popularity.
- 3) *EdX* - EdX focuses on students and helps them transform into skillful learned people through cutting edge technology, innovative pedagogy, and rigorous courses. The number of streams available is less in edX when compared with others however; they are well varied over a range of verticals. edX is also famous for its structured content, which is very descriptive and explanatory. edX uses videos as their major medium to share knowledge.

edX also offers courses in other languages – which means, the courses are not only available as transcribed texts, the whole format of the course can be made available to a student in a foreign language. edX has made mastery certificates available for all the courses it offers. Proctored certificates are also provided on an additional fee to make the education credentials of the student a lot stronger. The students are encouraged to participate in the forums of edX, which has been devised as a great platform of knowledge sharing and interaction for the learners.

- 4) *Canvas Network* - The next best player in providing MOOC is Canvas Network. Canvas is positioned as a platform for teachers, learners and institutions to promote open online learning that makes sense for every stakeholder involved. Canvas gives teachers and learners a very unique growth opportunity where they apply their millions of thoughts and share it at one platform, which eventually produces some amazing Results to be shared with the world. What sets Canvas apart from other players is the access of MOOC, since it provides to a lot of colleges other than only the top colleges and universities. This, in a true way, acts as a higher education provision to all in the world.
- 5) *FutureLearn* - FutureLearn has partnerships with 22 universities in Britain, as well as one in Australia and one in Ireland. Partners in Britain include the Universities of Birmingham, Bristol, East Anglia, Exeter, Leeds, Southampton, and Warwick, as well as Cardiff and Lancaster Universities, Queen's University Belfast, and King's College London.
- 6) *Iversity* - This Company focuses on a structured course environment and uses multimedia teaching materials extensively. The assessment feature followed by Iversity is through multiple choice options and peer review. This helps in engaging the students and providing qualitative and quantitative feedback. Iversity offers a discussion board for students to experience a peer-to-peer learning by interacting with each other, sharing references or general observations.
- 7) *NPTEL [8]* - March 14 2014: The Indian Institutes of Technology and the Indian Institute of Science have joined hands with the Indian Ministry of Human Resource Development's through National Programme on Technology Enhanced Learning (NPTEL), to launch Open Online courses on the massive open online courses (MOOC) model. The first course in the portal was on programming, data structures and algorithms targeted at second year college students, with an option to attend a test in-person at the end of the course in May or June 2014. The course will run over ten weeks with 2-3 hours of lectures per week and online assessment of work. The course is powered by Google's open-source MOOC (Massive Open Online

Courses) platform Course Builder and it runs on App Engine and Compute Engine.

V. CONCLUSION

In a developing country like India where significantly large number of people live in rural areas and cannot afford quality education, MOOCs can definitely be considered as game changer. MOOC is a platform where faculties and subject experts from all universities and organizations across the world, come together to teach you the subject of your choice available in the MOOC providers list. MOOC is a platform where faculties and subject experts from all universities and organizations across the world, come together to teach you the subject of your choice available in the MOOC providers list. In this way you get access to courses that are taught in top universities across the world. The status of education has always been the primary factor of a nation that defines its academic capital, human resource and vision of development. Wave energy devices can be categorized in many ways by power capture mechanisms. There is no common categorization widely accepted within the international research and technology development (RTD) community due to different aims. Only students with a lot perseverance and self-discipline can complete these courses. Students who are unable to manage their time often drop out of these courses. Due to the above reasons the dropout rates of MOOCs is very high. As per a research, on an average only 7.7% of the learners complete MOOCs. These courses can be coupled with certificates and badges as an incentive for completing the course, however one cannot ensure whether the student will complete the course or not.

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