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Understanding MOOCs (Massive Open Online Courses) and its Pedagogy to Use it as a Potential Solution for Learning

Abstract

Through the ages, the will of providing low cost and effective education has existed but we were unable to find a potential solution for it. MOOC can be a potential solution for free education but there is to understand its nature, characteristics, types and pedagogy. There are two types of MOOC -C-MOOC and X-MOOC. C-MOOC based on the theory of connectivism and X-MOOC based on behaviourist model. X-MOOC provide a structured and centralized way of delivering the content. Both types of MOOC have their strength and limitations. MOOC is becoming more and more popular with time as more than 110 million learners join MOOC but according to the Harvard University, only 6 per cent of the total candidates complete the course which shows that there is a need to explore the ideas to use it effectively. MOOC is a good source of knowledge, but we need to understand the pedagogy behind different MOOC so that it helps the teachers and learners to use it effectively and efficiently. This paper is based on the analysis of the available literature and research conducted on the effectiveness of MOOC programme in a blended mode for teacher education course by the researcher. This paper tries to find a potential solution to use MOOC in the best way for learning. It will help the learners to choose different MOOCs according to their needs, learning styles by making them understand the pedagogic difference between the types of MOOCs.

Keywords: *Massive Open Online Courses (MOOC), Connectivist MOOC (C-MOOC), Extension MOOC (X-MOOC), Hybrid MOOC (H-MOOC)*

Introduction

The Internet provides a great platform for life-long learning and becomes unavoidable in our daily life. The Lockdown period due to coronavirus proves it. During Lockdown period other than corona warriors people stay at home to break the chain of coronavirus and utilize their leisure time by performing different activities. Many peoples join online courses to enhance their learning, watch online videos, play online games and work from home using the internet. Online courses used the internet to deliver the content online to the home computer of the learner. In these courses student—and instructor interact online via e-mail, chat rooms, and threaded discussions. Learners get access to the best online courses from all around the world and get qualitative education with the help of internet. MOOCs stand for Massive Open Online Courses. These are free online courses which can be easily accessed by a large number of people.

There are two types of online courses, payable/chargeable online courses and free online courses. Courses which charge a tuition fee for the online content are mostly with a limited number of seats and time-period. Content of such courses can be accessed for a limited period. These courses mostly offered a certificate for successful completion of the course which can be helpful to enrich the portfolio. Other types of online courses are free courses which do not charge any kind of tuition fee. MOOC is a free online course that offers open access to a massive number of learners. Most of the MOOC allows access to the content for free but only a few provide free certificates otherwise you need to pay some minimal charges for the certificate. This varies from

course to course. These certificates can be beneficial to enrich a profile and provide a better job opportunity.

M Huge Number of individuals can enrol in the course
Online registration
O Open content
Free of charge
Affordable
O Can be accessed with the help of the internet from anywhere at anytime
Self -paced
Flexible timing
C Interaction with an online community

M	Massive
O	Open
O	Online
C	Course

Every letter is negotiable

MOOC provides world-class education, promote equity and quality; reduce expenditure in education; improve gross enrolment ratio; provide updated content; provide self-paced and individualized learning; promote collaborative and independent learning and bring innovative initiative in teaching. (Bhardwaj. K & Hooda. M, 2019)

According to Class Central survey MOOC Report (2019), the MOOC movement has reached 110 million learners (excluding China). More than 900 universities offered 13.5k courses,180 micro-credentials and 50 MOOC based degrees.

From 2012 until now, huge growth is observed in MOOC which also reveals the craze for MOOC in this global era and makes it more important to study. MOOC is basically of 2 types C-MOOC and X-MOOC. To understand different types of MOOCs, we need to know how it evolves, which principle and theories are they based on and how it is developing. With this teacher/professional can choose among the type of MOOC which is beneficial for them and their students.

Evolution of MOOC

In 2008, the MOOC (Massive Open Online Course) came into existence. David Cormier was responsible for coining the term MOOC. Krist mentioned that "The massive open online course (MOOC) phenomenon comes from connectivist theory". The first MOOC is the "Connectivism and Connective Knowledge course (CCK08)" created by George Siemens, Stephen Downes and David Cormier. The first MOOC was C-MOOC in higher education which was offered through Extended Education at the University of Manitoba, Canada and the Learning Technologies Center. In this course, 25 students from the university pay the course fee who are offered credits and was opened for others to join for free who are interested to join without credit. This course brings a huge number of participants i.e. over 2000 which belong to 81 nationalities. The duration of the course is 12 weeks. This shows that even as its evolutionary phase learners show great interest.

A MOOC was developed in 2011by Sebastian Thrun and Peter Norvig at Stanford named "Artificial Intelligence." This course openly invites anyone to join and over 1,60,000 people joined the course from 190 countries. In January 2012, Sebastian Thrun and Peter Norvig created a company named Udacity to explore this format further.

In April 2012, Coursera was started by two colleagues of Stanford. They are Andrew Ng and Daphne Koller. MIT and Harvard joined and created the edx platform in May. This form is referred to as X-MOOC which is also called Extension MOOC. In this type of MOOC new tools were introduced for handling the large-scale collaborative learning and assessment and methodology of MOOC was improved as renowned universities came forward to create MOOC which meant professors of such renowned institutions deliver the content.

Now, more than 900 universities delivered MOOC courses and many renowned universities such as Harvard, Yale and Stanford which are internationally recognized

offered most of the MOOC courses. Some of the websites that offer MOOCs are ALISON, Canvas Network, Open Learning, Coursera, iversity, edX, Saylor, Udemy, Academic Earth, Future Learn, Peer to Peer University etc.

The Pedagogy Behind the MOOC

According to the Oxford Dictionary, Pedagogy is the practice and method of teaching and learning in an academic discipline. It studies how skills and knowledge are imparted in an education context. Pedagogy often described as the act of teaching. Its process influence and get influenced by the political, psychological and social development of learners. Pedagogy includes teaching styles, teaching theory, feedback and assessment of teaching and learning. It includes the process or way teachers deliver the content in the classroom. Few basic approaches of teaching are constructivist approach, collaborative approach, inquiry-based approach, integrative approach and reflective approach.

MOOC seems to support inquiry-based learning, reflection, peer learning and social constructivism as students explore through questions and interactions by putting their doubts on the discussion forum. Courses are joined by a huge number of diverse audiences from all around the world. This creates an opportunity to share knowledge and different ideas without any geographical limitations. MOOC provides easy access to global resources and provides students with an idea where they stand in global competition due to unlimited enrollment across the globe. These courses create an opportunity for collaboration between learners, educators and institutions which provide them with worldwide exposure. This exposure provides an opportunity to improve pedagogical techniques and cross-cultural relationships.

MOOC promote self-directed and autonomous learning. There is less interaction between learner and teacher in MOOC courses because of no fixed time to access the course. The structure is conceived to promote autonomous learning with many resources in the form of videos, links, documents, etc. and spaces for debate and communication.

MOOC provides time flexibility and self-paced opportunity. Most of the online courses have the flexible date of joining i.e. learner can join the course anytime but some have a fixed time of joining. Some MOOCs provide all the content simultaneously and others may offer them in fragments- week after week. Students have to go through assessments. To prevent learners from lagging and manage their pace, assessments may have deadlines.

The basic difference between C-MOOC and X-MOOC

C-MOOC is also known as Connectivist MOOCs. This type of MOOC is based on the theory of connectivism. The educational content in C-MOOCs used various digital platforms to make connections with learning communities, content and learners. Social platforms, blogs, wikis are also used for learning purpose to create and construct knowledge. Connectivists such as Siemens and Downes mentioned that Connectivism is focused on the flow of information, networks, individual participants and the new forms of learning which provide result. In this teachers just provide initial learning environment and context to bring learners together. Connectivists assumes that learning occurs through reflection on its meaning and exposure to the flow of information. C-MOOC is designed to generate network effects for learning. Anyone can be the creator of the content and also provide informal feedback to other students for evaluation purposes. Students shares their knowledge with others. An online community develops the educational content for willingly shared with others in C-MOOC (Jonathan Haber). It facilitates a self-organized pattern of collaborative learning. Downes argued that "Connectedness/interactivity,   openness,

autonomy and diversity" are four primary principles on which connectivist learning is based. (Margaryan, Littlejohn and Milligan, 2013, p.150). The learning experiences are decentralized, networked and open in C-MOOC. Mackness, Karousou and Williams (2011) have characterized C-MOOC as open for everyone willing to create and willingly distribute the content, collaborative, self-organized and offers emergent learning style. (p. 43).

- X-MOOC is structured and centralized in nature as compared to C-MOOC. X-MOOC is based on behaviourism. The behaviourist model is based on the transfer of knowledge from teacher to student. In X-MOOC instructor prepares content like Audio/video content, pdf, ppt, word document etc., by which student receives information. In this MOOC learner acquires knowledge in an expert-designed course. Rodriquez (2012) has argued that X-MOOC courses employ an instructive or cognitive-behaviourist pedagogical approach. These courses delivered by a professor who professionally produced video lecture series. Mostly short videos with integrated quiz are designed to maintain focus and retain the knowledge. X-MOOC offers a structured course with well-defined objectives and high-quality learning material. It also provides proper assessment and feedback. X-MOOC is an idealized form which optimizes the efficiency of knowledge and competency acquisition" (Mazoue, 2013). It follows a formalized approach which has been criticized as operating on regressive pedagogical principles (Tirthali and Hollands, 2014; Stacey, 2014; Sangra, Guardia & Maina, 2013; Rodriguez, 2012). Mackness, Waite, Roberts, and Lovegrove (2013) mention that the X-MOOC is still under review as some researches suggests that by just providing large scale content videos, notes, documents etc, learning and understanding by learners cannot be enhanced. (p. 154).

Strength and Limitations of C-MOOC and X-MOOC

George Siemens stated, "C-MOOCs focus on knowledge **creation and generation**,

whereas X-MOOCs focus on knowledge **duplication**." C-MOOC is a participant-driven process which includes community-generated material. This type of MOOC facilitates self-directed and self-determined learning. Studies found that C-MOOC are challenged by the low-social presence; lack of course structure, inexperienced and self-directed learners, passive participation and lack of instructor control.

In X-MOOC content is delivered by instructors from top-ranked universities or higher education colleges and, in some cases, a non-profit organization. X-MOOC which are content-based are online versions of traditional learning formats. Multiple choice questions and short answer questions formats are commonly used for assessment in X-MOOC. The course materials in X-MOOCs are pre-recorded lecture videos which are 3 to 15 minutes long, audio recordings, PowerPoint presentations, text documents, practice exercises and URLs to other resources. X-MOOC is based on Behaviorist Approach and the information transmission model. Social Constructivism is a pedagogical approach which argued that each learner constructs meanings with their understanding which creates new knowledge and integrated it with the existing knowledge. (Dron and Anderson, 2011, p.85). Social relationship with other students using discussion and chat with the help of which new skills were developed. X-MOOC also faced some challenge like low completion rate, accountability and accreditation. So, to overcome such challenges of both type of MOOC, a MOOC initiative was evolved. Many studies describe that hybrid MOOC initiatives show better learning gains in comparison to traditional approaches (Nath and Joseph,2013; Bhardwaj and Hooda, 2019).

MOOC Based Hybrid Initiatives

In C-MOOC, it's difficult to keep track of student's assignment and involvement but it can be easily handled in X-MOOC. Language can be a barrier while offering and using MOOC. For example, in India, we

have 22 constitutional languages but it's not possible to develop MOOC in all languages. Most of the MOOC is developed in English and other international languages. MOOC has not been used as a credit learning course at universities which make them less valuable for carriers but H-MOOC can make this possible. Less rate of completion and lack of interaction with the professor can also be handled in H-MOOC or Hybrid MOOC. MOOC may offer discussions, but they don't have any real-time back and forth conversations. Lack of feeling of caring from an instructor and interpersonal relations hampers the learning environment. MOOC instructional paradigm works best only for self-directed and self-motivated learners. All these challenges of MOOC can be overcome with a Hybrid-MOOC. H-MOOC use already created MOOC; it's a middle category which better aligns with theories of online learning for a wider range of MOOC applications. The goal of H-MOOC is to balance the weakness and strength of C-MOOC AND X-MOOC. The initiative of H-MOOC has benefits of face to face learning and e-learning being provided to learners. With that, the problem of low completion rate can be handled by inculcating MOOC in institutional curriculum and teacher's guidance.

Delgado et al. (2015) mentioned 6 hybrid initiatives that integrate MOOC with face to face learning. Some studies mention that these initiatives can be better than C-MOOC and X-MOOC. They are (1) Flipping the classroom, in which students first prepare content from home with the help of MOOC then go to class to reinforce their understanding; (2) Local Digital Prelude, in which first part is completely online and second is face to face; (3) Canned digital teaching in the face to face course, in which MOOC based content is used as a textbook in a face to face residential course; (4) Canned digital teaching in the face to face tutoring, in which MOOC-based content is used for exam preparation with tutoring in office hours; (5) Canned digital teaching with remote tutoring, in which MOOC is completely online and tutoring is provided through Video-conference and (6) Remote tutoring in the face to face courses, in which digital initiative like a live session with experts are provided with the traditional course.

Conclusion

MOOCs are free online courses designed for a huge number of participants, accessed from anywhere, anytime with the help of the internet without any pre-eligibility criteria. There are 2 types of MOOC i.e. C-MOOC (Connectivist MOOC) and X-MOOC (Extension MOOC). C-MOOC is based on Learner-centered, distributive and connectivist approaches. C-MOOC possess some limitations as it is less comprehensive. There is a chance that misconceptions and misunderstanding of information can hamper the learning process. This limitation is catered in X-MOOC which introduced new tools for handling the large-scale collaborative learning,—assessment and methodology of MOOC was improved as it provides authentic content. X-MOOC is based on behaviourist model, information transmission model where learners receive information but this MOOC also poses some limitations as it focuses more on the transmission of information and knowledge duplication. To balance the strength and weakness of both the MOOC, a hybrid initiative can be helpful. A hybrid initiative like Blended mode of MOOC in which already developed MOOC is used. MOOC with face to face instruction can be used as a better way of learning. MOOC is providing life-long learning but its completion rate is very low. Some researches show that blending MOOC with other learning methods like face to face gave better learning scores and completion rate. More models of hybrid MOOC are evolving with time which can be used as a potential solution to use MOOC in the best way for learning.

References

Class central. (n.d.). Retrieved from https://www.class-central.com/university/harvard

Delgado. (2015). Framework hybrid-emooc. *European MOOCs Stakeholder summit.* Retrieved from https://pdfs.semanticscholar.org/9bb3/0befd1073485e84cf828543b766bebff978a.pdf

Downes, S. (2010). New technology supporting informal learning. *Journal of Emerging Technologies in Web Intelligence, 2(1), 27-33.*

Downes. Research on e-learning and ICT in education. *Springer.* Retrieved from https://books.google.co.in/books?id=eO8-BAAAQBAJ&pg=PA9&lpg=PA9&dq=Downes+argued+that+%E2%80%9CConnectedness/interactivity,+openness,+autonomy+and+diversity&source=bl&ots=G8vI2N4we8&sig=ACfU3U1CHCNwlG-Dw8N7tIyYpeQ8z1O6XQQ&hl=en&sa=X&ved=2ahUKEwjw6r2OuqToAhXR6XM-BHXstCXoQ6AEwBHoECAgQAQ#v=onepage&q=Downes%20argued%20that%20%E2%80%9CConnectedness%2Finteractivity%2C%20openness%2C%20autonomy%20and%20diversity&f=false

Guardia, Maina and Sangra (2013). User-Centered Design Strategies for Massive Open Online Courses (MOOCs). Retrieved from https://www.researchgate.net/publication/306499460_Facilitating_Student_Interaction_and_Collaboration_in_a_MOOC_Environment

Harvard. Reconsidering MOOC Completion rate. Retrieved from https://harvardx.harvard.edu/reich_12814

Hooda, M. & Bhardwaj, K. (2019). Capacity Building through Massive Open Online Courses (MOOCs) for Teacher Education Programmes in India. *Studies on Home and Community Science.* Retrieved from https://www.researchgate.net/publication/339129728_Capacity_Building_through_Massive_Open_Online_Courses_MOOCs_for_Teacher_Education_Programmes_in_India

Hooda, M. & Bhardwaj, K. (2019). A potential solution for challenges in Indian Higher Education. *Voices of teachers and teacher educators.* Retrieved from https://www.researchgate.net/publication/340005602_MOOCs_A_potential_solution_for_challenges_in_Indian_Higher_Education

Margaryan, Littlejohn and Milligan. (2013). Instructional quality of Massive Open Online Courses (MOOCs). *Computer&education.* Retrieved from https://www.oerknowledgecloud.org/archive/1-s2.0-S036013151400178X-main.pdf

Siemens, G. What is the difference between XMOOC and CMOOC? Retrieved from http://blogs.onlineeducation.touro.edu/distinguishing-between-cmoocs-and-xmoocs/

Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. *International Review of Research in Open and Distance Learning, 12*(3), 39-60.