Instructional Design of Massive Open Online Courses

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Abstract

Massive Open Online Courses (MOOCs) are generally conceived as free online courses where anyone can enroll. They are designed to provide learning opportunities for advancement and deliver positive learning results which can be used for career development. However, some issues arise because of the following factors: 1) uncertainty in finishing the course 2) cost consideration in obtaining a certificate of completion 3) learning attention and management 4) technological glitch 5) appropriate theoretical applications 6) connectivism.

For learning positivity, Instructional Design of MOOCs must highlight learning engagement with teacher's facilitation accentuated in immersion activities designed to promote student collaboration guided by the principle of connectivism while enhancing teaching skills and methodologies.

Keywords: behaviorism, connectivism, instructional design, MOOC, teacher's facilitation.

1. Introduction

Massive Open Online Courses (MOOCs) in general and xMOOCS in particular exemplify cognitive learning. These courses are characterized by highly structured content mostly in the form of streamlined video lectures where learners engage in learner-content interaction from the various resources available in the internet. This process is based on the principle of 'guided didactic interaction theory' (Holmberg, 1983 as cited by Evans & Jukupec, 2022), a conversational style of writing that connects learners with content in a more casual manner.

Due to the high structure and low dialogue in xMOOC, a great deal of autonomy of students is required to reduce the Transactional Distance (Moore, 1993 as cited by Evans & Jukupec, 2022) defined as a psychological space between learners and the teacher which can be applied in distance education.

From a behavioral perspective, certain rigidities are observed and followed in MOOC courses that instigate stimulus-response mechanism. Due to these rigidities and rules, behavioral learning can instigate challenges such that more advanced students may face boredom due to the repetitive task of sequential and procedural learning. Thus, a great deal of strategies should be in place to deal with such problem. For instance, a personalized system of instruction (PSI) that focuses on self-paced learning sequenced from easy to difficult ensures that learning emanates before the student moves to the next stage and a system of reward-punishment will correct learning difficulties which can further be enhanced through feedback mechanisms.

Lastly, cMOOCs are types of MOOC that exhibit connectivist pedagogy is best exemplified through network learning among peer learners illuminated in collaborative interactions among learners and the teacher accentuating learner-teacher interaction through feedback mechanisms, assessment practices both formative and summative. Addressing the issue on connectivism implies its critical role in elucidating quality learning. For instance, when students connect with fellow students via online discussions, the possibility of subjective learning can lead to relativism rather than objectifying truth so that some might opt to believe an idea based on self-dictated criterion such as popularity of the speaker. Network learning allows for expanded views to unfold but how true or valid such views remains a challenge. In the online platform, connectivism is made possible through collaborative discussions through student fora, collaborative projects such as writing an e-journal emphasizing learning within social context.

1. 1 Massive

Accessibility of MOOCs extends beyond campus education such that Instructional Design should incorporate large number of students from different geographical areas. This feature attests to the massive scale not only in terms of particular number of students but its capacity to expand to large numbers without causing major disruption to any of the component parts or activities of the educational experience (Anderson, 2013). While in traditional institution, scalability of enrolled students can be determined solely through the registrar's record of students, in MOOCs students who enroll, log in, and take the assessment tests and successfully pass or fail the subject can show different results. This is a striking difference between the two modes of learning - distance and campus-based.

In dealing with the massive scale of MOOCs, 5th generation of Distance Education (Taylor, 2001) explains an automated response system that will electronically store information of frequently asked student concerns which can be accessed by distant students, for one. In xMOOCs where structured lectures guide students in content-focused learning, the use of digitized video lectures, online resources accommodate large number of students who are geographically distant. It is to be noted that the highly autonomous nature of distance education is a consequence of a high structure and low dialogue with the teacher as explained in the Transactional Distance Theory of Moore.

1.2 Openness

Openness in MOOCS has something to do with open accessibility of courses designed for various learners from different geographical locations. This feature defines a wide scope of learners that can do the learning activities in their own time. Openness stresses wide accessibility of content but not to control content such as making a revision. This idea is born from the standard, structured presentation of course syllabus, learning units, activities and assessment practices designed by a network of experts from the different subsystems of Distance Education to deliver quality course. However, cMOOCs which have connectivist characteristics tend to present knowledge that needs to be enhanced by building network of ideas from different people. This method elicits control of content more than becoming a receptacle where students will simply memorize.

1.3 Online

Web-based learning such as in the case of UPOU is one testament of distance education that places emphasis on online learning in terms of accessing discussion forums, student support services, grade inquiries and other student queries where these questions are addressed upon access to the student portal assigned to each student. Further, the conduct of asynchronous discussions via discussion boards, collaborative projects such as e-journals, among others, indicates that MOOC attains its educative goal of efficient educational experience with the use of online materials. Assessment tasks such as automated quiz is likewise realized in the online setting making MOOC learning just as effective as that of face-to-face learning.

This online feature of MOOC implies strong computer mediated communication (CMC) via the internet in conducting various asynchronous discussions such as blogs, wikis, discussion fora along with synchronous chats, video conferencing via Skype, and facebook among other social media sites. This is to emphasize the point that CMC can still emanate from non-internet-based technologies such as CD/DVD ROMS that embody asynchronous learning activities without the use of internet.

1.4 Course

Courseware follows a structured course such as those found in classroom-based subject. However, finishing the course is more or less lax and student-paced unlike in formal learning institutions where learning tends to be more paced. In MOOCs students can jump in the course anytime and anywhere in the course because content, activities and

assessments are designed to this flexible nature of learning. For example, a learner who jumps to Chapter 3 and misses Chapters 1 and 2 will still be able to catch up with the course without reading previous materials extensively as the current chapter (3) will provide synthesis of prior learning, for instance.

Following the aforementioned statements on sequential learning, it is imperative that course design in MOOC integrates prior knowledge into the new task so that students can freely join the course any point in the course. This is a challenge though to technical courses that demand associationist, sequential mode of learning where knowledge progresses from simple to more complex.

2. Issues Related to MOOC

2.1 Multiple learning theories to consider. This issue asserts multiplicity of theoretical underpinnings that must follow in each MOOC Instructional Design. For instance, heavy video streamlined lectures elicit high cognitive learning through various mental processes that can result to cognitive overloading. In addressing the issue, modality principle that highlights audio-visual codes done simultaneously should guide instructional designers in developing a course to reduce cognitive loading. On the other hand, behaviorist theory asserts a strict, rule-based learning which can put pressure on learner's motivation to continue with the course. However, this issue can be addressed through personalized learning system that places importance on self-dictated learning mechanism. Finally, connectivist philosophy instigates social learning through various discussions and other interactive activities of students.

2.2 Equivalency theorem. Emphasis on content-learner interaction, for one, can exemplify quality learning experience with learners focusing on content available from the internet; learner-learner interaction to be realized when students interact with fellow learners through various discussions, collaborative activities, among others; teacher-learner interaction from various lectures, feedback, formative and summative assessment practices. The use of any one or two of the forms of interaction can be meaningful in MOOC considering the various learning platforms it provides. Technological affordance in MOOC is indicative of quality learning.

2.3 Cost considerations. MOOC was originally meant to be free to all learners but nowadays, certificate of completed course is awarded upon payment of a fee, even if enrolment to the course is still open and free. Other costs to consider here are professional fees to course designers, technology experts and faculty that need to be addressed for the continued delivery of service as the case maybe.

2.4 Top-to-bottom or bottom-up approach to learning. Course design of MOOCs should consider a holistic and systemic view of learning such that more complex task to be addressed first until a detailed understanding of connecting parts are deciphered. This ensures that learners know the big picture and are able to reflect on those learning situations. On the other side, highly technical courses will demand a bottom-top approach in Instructional Design such that simple to more complex units will make learning more efficient. There is a high degree of cognitive learning through various mental processes such as rote and discovery learning as well as behaviorist approach that builds on stimulus-response mechanism in acquiring knowledge.

3. Critical Analysis on Instructional Designs of MOOC

One of the main issues that confront MOOC in its network approach is its reliance on online technological platforms that result in technological glitches (Jasnani, 2013). Indeed, current technological features embedded in design such as simulations, gamifications, wikis, blogs and much more which are not well-understood by some students provide learning difficulties as in the case of an article "MOOC Mess" on the crash of Coursera's "Fundamentals of Online Education: Planning and Application (Jasnani, 2013) which reported technological glitches along with assignment difficulties of students. In connection with this, a strong collaboration between faculty, information and Technology (IT) experts, videographers, instructional designers must be in effect following the principle of Total Systems view of learning that emphasizes collaboration from various aspects to deliver quality

course. While standard online learning caters to a specific number of students which tend to be small as compared to the "massive" enrolment of MOOC learners, a broader technological consideration must be in place, including wifi speed, size of learning media to be delivered.

The use of vide of lectures as another instructional design, moreover, poses attention problems from students who have some little patience to watch long lectures. This has been reported in the case of xMOOCs where students watch video lectures and take automated assessments. Learning nuggets (Jasnani, 2013) explain that today's highly digitized learning emphasize small learning bites of video lectures to capture student attention instead of lengthy presentations that increase cognitive loading which leads to loss of interest. On the issue of student retention, while some finish the course, others fail to do so, in fact, statistics shows less than 10% of enrolled students do all learning tasks and successfully pass with some grade. In this regard, an inquiry into the dismal performance should address the question why such a small percentage was reported. One of the reasons is motivation. Students in MOOC have mixed emotions in terms of seriousness in completing a course while some are just 'lurkers' who tend to have passive participation in course activities. Others contend credential issues such as legitimacy of grade equivalent to that from an academic institution. With these reasons compounding, it ascertains that instructional design in MOOC should address learning differences of students which means various content formats that employ multimedia resources in small learning nuggets, activities that build on student construction of knowledge and assessment practices designed to measure learning progress should be of paramount concern. Such preparation can be tedious on the part of the faculty considering the magnitude of adjustments to be made. It will be noted that MOOC is massive and open meaning higher number of student enrolment as opposed to a regular online course where there are smaller students to deal with. In another scenario, heterogeneity of students attests that some learners will be so advanced while others have beginner knowledge. The content presented should consider this discrepancy. Of course, course title and description are guidelines to inform appropriate participants but the final decision to enroll rests on learner's decision regardless of prior academic achievement.

Another issue confronting MOOC instructional design is its philosophy of connectivism which ascertains network learning through the use of vast resources the Internet affords and communication with fellow learners and the teacher through discussions and collaborative activities will have some varying degrees of just how students connect themselves with fellow students and their teacher. Once again, the issue of massive scale can raise difficulty in managing connectivity among learners. In the case of cMOOCs which apply connectivism, one of its characteristics is that students experience 'chaotic' learning which could be accounted for immense diversity in student building of knowledge and a high degree of learner control in doing them. These reasons, though problematic if not moderated well by the facilitator, also have some beneficial impacts. For one, students' co-construction of knowledge enables them to immerse in social learning through building of new ideas situated within the context. This is somewhat similar to situated cognition as explained by Driscoll which ascertains knowledge within lived practices. The issue of handling vast amount of student construction of knowledge is a challenge to the facilitator in terms of encouraging constructive learning at the same time bringing order in chaos that it tends to elucidate. Highly constructivist learning can turn to subjectivity of knowledge. The next issue, learner control, is one paramount concern as MOOC learning is generally self-directed where the student creates his or her own pace in going through all the learning activities. Now, when instructional design encourages collaborative activities that call for large and heterogeneous participants, different mind sets, expertise, motivations of those students can have profound impact on participation thus leading to weak outcome. It will be noted that some novice learners, passive participants will be mixed with experts and active members, such situation to bring more chaos. How to resolve such difficulty once again rests on the teacher or facilitator's management of class learning. Prior to realization of collaborative learning is an individually-focused, autonomous learning that instructional design of MOOC must consider. In connection with this is authentic learning that students must achieve which becomes the hallmark of most cMOOCs following connectivist approach. In some programs of Coursera and EdX companies, a project base that incorporates knowledge application assumes that learning is actively pursued by students through construction of models, solutions to certain problems in the project. In this way, authentic learning emanates.

The role of the teacher in MOOC is generally the same with that of standard online learning where instructional pedagogy is not the main quality but rather facilitating student learning. Although in xMOOCs where the format is similar to traditional class learning, video lectures provide heavy content from the teacher and students are more like receptacles of teacher's pedagogical instruction. But today's models of MOOCs follow facilitative role of the teacher. Moreover, following principles of student-centered learning, facilitation is also performed by students within specific group assignments.

There is an academic issue that is deemed important in the pedagogical role of the teacher in MOOCs that deserves some discussion. The proliferation of this online platform used by academic institutions, e.g. Harvard, MIT Universities articulates that expert instruction cannot be undermined in the design process. Jasnani (2013) discusses Immersive and Contextual Instruction that should be used in MOOCs. Immersive instruction connotes the use of advanced Web 2.0 applications such as virtual games, blog, wikis, videos in delivering content. Following the principle of multimedia learning, there is a higher transfer of learning when both audio and visual codes are used simultaneously instead of just pure text reading. This immersive method meets digital requirements of today's learning ways. Yet, once again technological affordance is a challenge to meet those with incapacity issue that has to be balanced by the designer. In the contextual aspect of instruction, real-world learning becomes pertinent in delivering content so that learners are able to connect theories and concepts from experience. In this regard, expert instruction does not only mean theoretical prowess but situating knowledge within real world context is an utmost consideration. Because the best MOOCs are short, usually an hour at the most, addressing a single topic, professors are forced to examine every bit of material as well as their teaching methods (Peterson, 2019).

In an article by Rita Cop (2011), "The Challenges to Connectivist Learning on Open Online Networks: Learning Experiences during a Massive Open Online Course", the concept of critical literacies attributed to MOOC asserts that learners need different competencies and abilities to feel comfortable (Cop, 2011). Again, this validates connectivist philosophy of active, distributed learning that is not controlled by the teacher but built by learners according to their learning needs.

Another issue on instructional design is assessment practices in MOOCs that normally have automated graded tests for summative assessment and facilitative form in formative assessment. The overused automated multiple choice-type of traditional test might have some practical use in technical courses but for those in Humanities, Philosophy and other fields that employ critical thinking, the use of aforementioned assessment technique does not deliver quality assessment result. Alternatively, problem based learning (PBL) such as construction of a WebQuest will make students apply critical thinking skills in solving problems. Roles will be assigned to group members in the performance of certain duties which illustrate active participation. Management of WebQuest activity will have to be carefully studied by the designer considering the diversity and massive number of students enrolled. Another form of assessment in MOOC is peer assessment that calls for standard rubrics to be in place for fair and honest evaluation of student work. Over all, just like in standard online learning, constructive alignment of course goal, learning task and assessment procedure should guide the teacher in designing forms of assessment.

In designing MOOC instruction, is it fair to ask: should a course format insist that the course be finished by the student? This question is addressed due to the nature of MOOC that is learner-paced and somewhat nonlinear where students can join in the course at any point. It will also be noted that MOOC is deemed as an academic support for students who wish to have deeper knowledge in a subject. Following such explanations contend the non-requirement for students enrolled in an MOOC to finish yet it seems poignant for some instructors who designed the course seriously only to be taken lightly and rejected by students. But then again, it is also incumbent upon the teachers that MOOC course will not earn students a formal academic rating even with certificates awarded to those who finish. In some discussions on this topic, MOOC model attests that acquisition of knowledge and skills is paramount to learning in the connected environment whether certified or not. Some companies will ask for related skills from prospective employees and such skills can be acquired through MOOC learning. Hence, the design of instruction will have some bearing on relevant knowledge and skills to be acquired by students. Related to this discussion is the

concept of apprentice learning that embodies the principles of community of practice. New learners in a course in MOOC can learn from expert learners through collaborative works. How is this effectively done requires active monitoring of learner progress and making sure apprentice ideas are respected and enhanced rather than rejected upfront. Such situations, if persistent, can lead to decreased level of interest thus the student will not be able to finish the course. The aforementioned considerations should be addressed seriously by instructional designers following the principle of learner-centered approach to learning.

One last important issue worth mentioning is copyright ownership of instructional designers mainly the faculty who develop the course curriculum. Courseera, Edx are examples of MOOC providers that link with academic institutions where the faculty is teaching MOOC. The design he or she develops will have ownership issues to consider because the academic institution will have its own protective policies that can be different with the course provider. Where does ownership of a faculty course design reside? Is it a sole intellectual property of the faculty or is it shared with the academic institution and/or with the MOOC organization? This requires stringent policies to be open for all parties concerned so that the faculty, most especially, does not lose rights to his or her own course design.

In conclusion, the foregoing concerns on MOOC instructional design need to be addressed for continued application of the earning platform by various institutions. The legacy that MOOC imparts to the students claims that knowledge and skills acquired will have continuing effect even in their practical lives with the interference of social media sites, blogs, wikis and so much more. This, in effect, calls for consideration in instructional design. Lastly, while MOOC originated in Western culture so that its design of instruction is heavily influenced by Western standards, some aspects can be enhanced to fit to the learning needs of students from other cultures as well.

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