# Integrating MOOC with Open Source Moodle:
# The New Direction of Learning
# at Sultan Qaboos University

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*Abstract*—**Massive Online Open Course (MOOC) is considered as a strong competitor for the next availability of educational tools and entered the field of higher education around the world. 2012 was a year of speedy era for education with the beginning of MOOCs to be used and learned for free in the world. It is commonly accepted and preferred because it has several advantages like large scale, no restrictions for the time and place, open free in which it can deliver a new knowledge acquisition approach for learners. In line with this, through investigating the utilization of MOOCs in some continents such as Asia, Europe and USA, it appeared that MOOC had been integrated local curricula through Learning Management System (LMS). The purpose of this paper is to examine the possibility of adapting MOOC to support the currently learning and teaching process in Sultan Qaboos University (SQU) that combines both online and face-to-face in order to promote and improve the way SQU delivers courses' content and host online learning activities by using Modular Object-Oriented Dynamic Learning Environment (Moodle). Also, to highlight possible opportunities when integrating MOOCs in SQU E-learning environment that will allow it to explore new learning models and innovative practices in teaching and learning.**

*Keywords—MOOC, bMOOC, cMOOC, xMOOC, LMS, Moodle, Blended Learning*

## I.    INTRODUCTION

Massive open online courses (MOOCs) are the current growth of open education resources and services, which could be used to solve some higher education requirements without disrupting the ecosystem. They open up chances for new pedagogies [1]. MOOC approach is not new with consideration of that Learning Management Systems (LMSs) already allow this type of education but for a limited number of students [2]. This means that the openness feature of MOOC approach is not fully utilized in LMSs. Currently, several universities around the world are offering courses in the form of MOOC. Also, they mentioned that expanding their reach is one side, whereas building the brand is another. It is essential that some universities are investing in MOOCs that will lead to innovations in teaching and learning. For example, in Asia remarkable MOOCs are offered by China, India and Pakistan. In addition, Tsinghua University in China is offering MOOCs courses in cultural studies in Mandarin, which allow students to be self-enrichment rather than get certification [3]. Further, top United States universities are racing to give their best courses under their best professors [4].

This paper studies the previous applications and experiences done in other countries to be able to know how to support blended learning in SQU using MOOC. It also describes possible opportunities and challenges during the integration of this approach in SQU environment. Through a case study, this paper aims to find how to integrate MOOC course in a blended learning environment that is designed for SQU students and what the results will be?. Section 2, demonstrates the related work. Section 3, provides background about the blended learning and MOOC. Section 4, presents integration of MOOC into blended learning environment. Section 5, describes the case study to represent the integration of MOOC into blended learning in SQU. Finally, section 6, drives conclusion and future directions.

## II.    RELATED WORK

MOOC was initially created in 2008 when Dave Cormier and Bryan Alaxander introduced an online course called Connectivism and Connective Knowledge [5]. The course was originally designed for twenty-five tuition-paying students. However, in an unconventional move, the course was opened to the online learning community free of charge. More than 2,200 students enrolled to the course without gaining any credit [6]. The last few years, limited number of famous non-profit universities like Massachusetts Institute of Technology, Harvard University, Stanford University, Illinois University, University of Michigan and University of California-Berkeley had implemented MOOC. Therefore, Hollands and Tirthali described that universities had accepted various situations toward engaging with MOOCs. Some institutions were promoting MOOCs called "producers," some other were using MOOCs established by other institutions in their programs called "consumers" [7]. Others were approving a wait-and-see method that examined MOOCs and has determined in contradiction of any procedure of official engagement or have not met with interest from faculty members to follow them. However, Wijaya and Assegaff discussed about MOOC and how universities in Indonesia could take benefit from MOOC to give their students learning materials with international standard. The authors introduced the current situation of the growing popularity of MOOC via a proposed strategy for universities in Indonesia to increase the quality of their existing learning material [8].

The emergent of MOOC as a technology of course delivery had changed the landscape of distance education. In addition to that, Toha examined the possibility of integrating MOOC as part of Universities Terbuka known as UT learning management system into Indonesia Open University systems as an alternative mode of delivery for UT degree programs. The author used Moodle as LMS for this integration [9]. The use of Moodle as LMS for UT online tutorial made the students to have synchronous or asynchronous communication with their tutors. Furthermore, Azhan and colleagues described a framework called ArmadaNet for a multi-institution collaborative MOOC platform. The authors choosed Moodle LMS as the web platform to support this multi-institution MOOC collaboration. The development of ArmadaNet as the model for the collaboration based on a hub that connects and displays courses hosted in the MOOC [10].

III. BACKGROUND

A. Massive Open Online Course (MOOC)

No doubt, MOOC offers course platform and student enrollment for a quick expansion. Engaging instructors, students, topics and courses had allowed MOOC to become the major topic in higher education. In the US, Canada and Europe. MOOCs and other initiatives in online courses had taken middle phase in academic teaching [11].

Moreover, Russell and colleagues mentioned that MOOCs have two essential differences from other educational technology: (1) MOOCs are available anywhere, anytime to let students to learn directly and with an extensive variety of conditions. (2) Successful MOOCs enable communication between students activity and that helps in solving problems, answering questions, adding resources to the course and supporting other student's activities [12]. In principle, Gore denoted MOOC as Massive: in registration for any course, the enrolment in some courses exceeded 100,000 students. Open: means open registration. Online: with no need for face-to-face method and attendance's participants and Course means the concept of educationally materials prepared to serve the learning process [13].

B. Blended Learning

The meaning of blended learning (BL) came from the concept that learning is not simply occurred for one time but learning is a consistent procedure [14]. BL combines face-to-face and online instructions. It allows students to work with instructors in a university and has online resources outside the university.
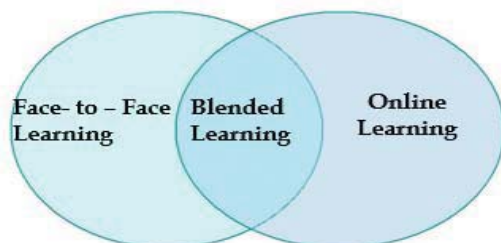


Fig. 1. Blended Learning.

There are several definitions exist in the literature that defines blended learning. As an example, Driscoll and colleagues defined blended learning as a set of instructional methods [15]. Similarly, via their study on the transformational potential of blended learning, Garrison and Kanuka found that blended learning environments take advantage of traditional classes, which increase the effectiveness of learning experiences [16]. A recent examination of 45 studies recommended that students in blended learning situations achieved better results than those in face-to-face sessions. This model denotes a formal education platform through which a student studies partly online [17]. In this case, the learner receives the knowledge partially through online material and instructions with some control over time, place and speed. In addition to providing online learning contents and instructions, this model still requires the learner to attend face-to-face classes [18].

IV. INTEGRATED MOOC INTO BLENDED LEARNING ENVIRONMENT

MOOC presents a new choice for blended environment learning course design. In BL, students inside campus are requested to participate in part or in whole in a MOOC course that is hosted at another university, the instructor's role is to complement the online learning with face-to-face learning [19].

As an example, Caulfield and colleagues described the work of Patti Ordonez-Rozo, who joint Stanford's introduction to databases MOOC course in her classroom in Spring 2012 at the University of Puerto Rico Rio Perdras. The instructor asked the students to enroll in the course, follow the online lessons. She focused on class activities, projects and assessments using the same instructions contents as in MOOC course [20]. Besides, Hobson reported that students when studying materials using blended MOOCs increased compared to the normal classroom [21]. There exist different blended learning models in the literature [22] [23]. The pedagogical design of this model emphasizes the ability of students to be self-learner of their process in an online environment. Accordingly, during MOOC learning no face-to-face lectures were planned to address the MOOC content. This blended learning model is the mixture of a face-to-face (F2F) and the learning management system on campus (LMS). The MOOC component is added to the already existing campus based course and the digital learning platform [24]. MOOC providers like edX have already showed the blended MOOC (bMOOC) approach in a higher education environment. An effective bMOOC can be seen as the merging of cMOOC, xMOOC, and face-to-face models, as represented in Fig. 2.
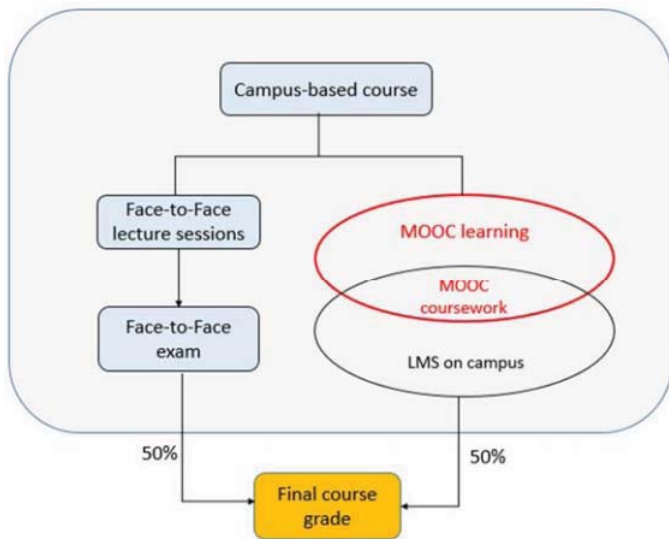
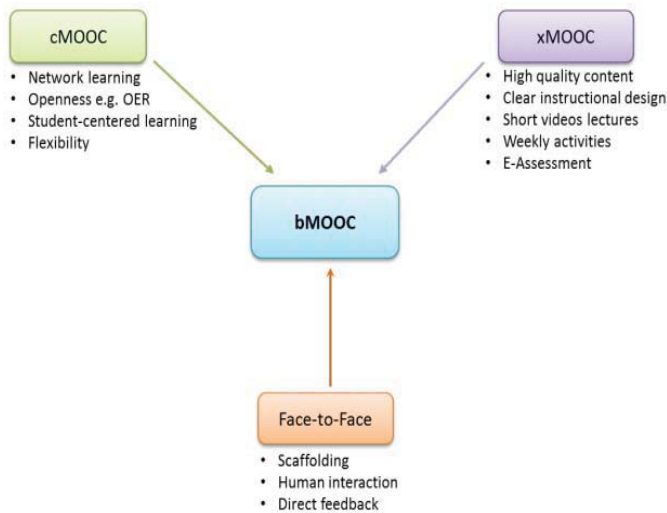Fig. 2. MOOC supports supplementary BL model [24].



Fig. 3. bMOOC as the convergence of cMOOC, xMOOC, and face-to-face learning [25].

In Fig. 3, cMOOCs assist flexibility, openness and offer networked space where students can state their own purposes, create and share knowledge among other students. Besides, xMOOCs follow a clear instructional design method and focus on the quality content of the course, where objectives of the course are sit by instructors via short video lectures and different assessments. For the, face-to-face learning it offers direct feedback, human interaction and scaffolding. Overall, bMOOC can be defined as the merging of cMOOC, xMOOC, and face-to-face learning models. That is what we will discuss and describe in the coming section on how can we integrate cMOOC into SQU Moodle environment?.

## V. SQU BETWEEN MOOC AND BLENDED LEARNING

At present, the teaching process in SQU is based on a blended learning approach that is commonly combined both online and F2F methods in the process of learning.

For instance, from one side students may attend a lecture in a classroom, while on another side they can complete online components of the course. Online and F2F learning models are parallel and complement one another. Moreover, active learning is a main feature of the flipped classroom and can be applied to any learning environment such as online, normal lectures or a combination of these. Collaborative learning is a vital element of active learning and can take place in F2F or online learning. Building collaborative learning into the design of the course can support learning community for students [10]. Bill Gates assisted the idea of implementing MOOCs in blended learning. He highlighted the significant role of face-to-face learning in improving meta-communication [26] for an online course to be successful. It is crucial to provide a necessary resource that is available in online learning [27]. Via the MOOC☐supported supplementary blended learning model that was discussed before, the current researchers want to study the possibility of integrating MOOC in blended learning with the purpose of integration of a course in SQU by using MOOC.

If this model is implemented in SQU as an educational environment, any selected course will be a mixture of F2F and MOOC as well as the Learning Management System (LMS). The idea is adding MOOC components in an already existing LMS, which is in this case Moodle. It is a Learning Management System that stands for Modular Object-Oriented Dynamic Learning Environment. It is an open source system under General Public Licenses (GNU) [28]. Moodle is the most successful LMS as an open source. This feature helped in facilitating the development and maintenance of the Moodle according to the users' needs [29]. As a result, the model will consist of two parallel learning processes: traditional F2F lecture and cMOOC Moodle.

### A. Integrating of cMOOC into Blended Learning in SQU

The design of blended learning environments that combined F2F and online might be a resilient and active model to improve classroom learning and to progress associations between instructors and students [19]. In addition, Ginns and Ellis suggested a useful way of approaching this issue by spotlighting on significant reasons in the online process that influence students' experience of how online learning assists their F2F method including good e-teaching, e-resources and appropriate interaction chances [30].

Via integrating cMOOC (in terms of dividing the course into parts to follow MOOC style) into a local course, it can support the learning process in SQU. As well as, the involvement of local faculty (instructors) and administration, help the incorporation of MOOCs into the local curricula. In this case, students need credits (if they take the course at a university) or certificates (if they take the course as a training course under the supervision of SQU). More importantly, for MOOCs to be included in the local curricula in SQU, academic regulations need to be edited in this case.

For example, there should be a request to create collaborative MOOCs with the participation of local faculty. If we integrate MOOC concept as a style into E-learning system (represented in Moodle). Fig.4 illustrates the comparison between Moodle to MOOC-Moodle in SQU.

In current Moodle in SQU, courses could be developed in it. Each course has 15 weeks duration for the whole semester including materials (lectures notes), assignments, activities and exams. The student should complete the entire course to get the credit hours in a blended mode. Conversely, if we integrate cMOOC in Moodle, each course might be divided into units or parts, the relationship within course parts are considered as low coupling. Each unit will take a specific duration between 3-4 weeks and consists of materials, assessments, exams and the relationship within unit parts are considered as high cohesion.
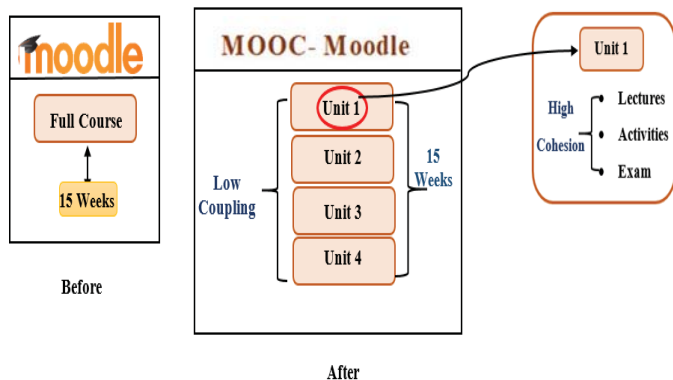


Fig. 4. Moodle vs MOOC-Moodle.

The current Moodle environment is shown in Fig. 5. Students from different colleges in SQU will enroll in the courses via Moodle interface with their university ID and password. The single course consists of lectures, assignments, projects, labs and exams. The course takes 15 weeks for the whole semester.
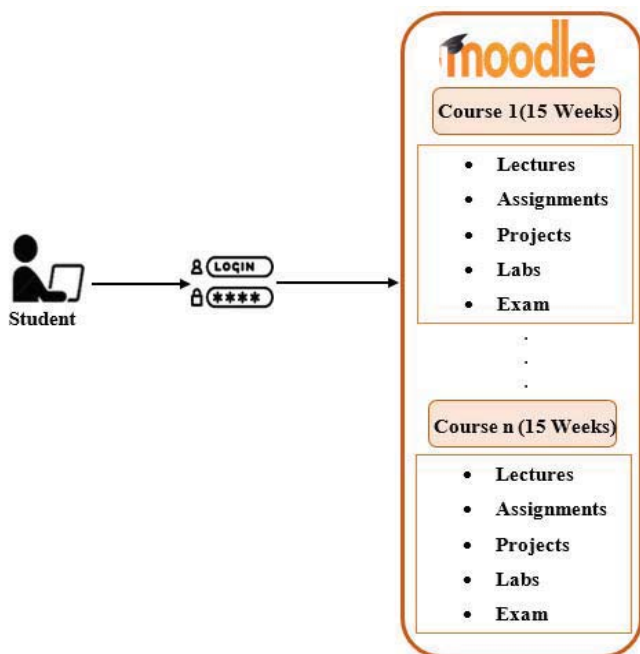


Fig. 5. Current Moodle Environment.

Overall, the researchers do not have to build a whole MOOC environment, which is very time-consuming. As Fig.6 below shows, for every course we can divide it into units or components.

Each unit has a specific duration from 3-4 weeks only. We can consider each unit as MOOC or mini-MOOC that consists of lectures, activities, assignments and exams. Moreover, each unit has a separate topic for instance, the topic of unit1 is not related to unit 2 and so on. It depends on the instructor, if he/she wants his/her students to take the course unit by unit or use the normal way as to take the whole course at one time. By this way, the researchers successfully implement the concept of MOOC in current E-learning system in terms of MOOC styles and open the course for a larger number of students that Moodle can occupy. MOOCs are not going to replace face-to-face learning anytime soon for SQU students. But, MOOC content will be as part of 'flipped classrooms'. If this is done well, it could be an example of how online educational technology improves the on-campus experience rather than replaces it.
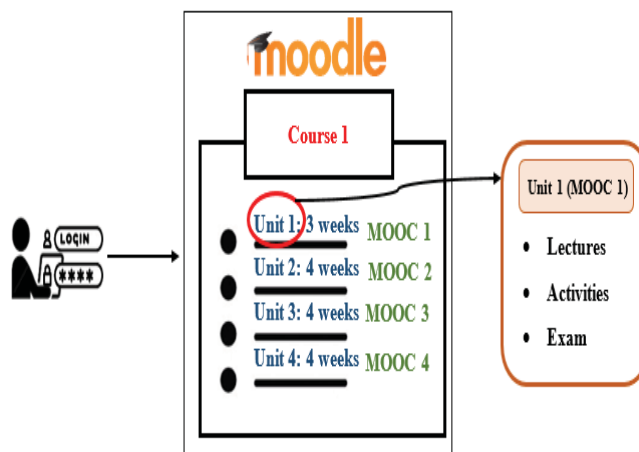


Fig.6. Integrated MOOC Concept into Moodle Environment.

## VI. CONCLUSION

MOOCs represent a unique opportunity to revive long-distance academic cooperation [31]. All in all, BL is Blended courses that combine online with face to face teaching in planning and educational manner [32]. There are many chances to improve the learning mechanisms in MOOC, such as more effective learning platforms and learning support services, to empower easier access and better learning for students [33].

The presence of MOOC will make instructors or lecturers in SQU to modify their way of thinking in conducting their teaching method. Essentially, SQU needs to follow the phenomenon of MOOCs and make strategic decisions on how MOOCs to be adopted in their unique environment [34] [35]. However, using MOOC to support blended learning will help to enhance the online environment in SQU, which mainly depends on Moodle, as well as help to increase lifelong learning effect inside the SQU and modify the current higher education. In addition, open a new direction for collaboration between SQU and other academic institutions in Oman.

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