Review Article

The Effectiveness of a Massive Open Online Course (MOOC) Environment in a Higher Education Institution in Malaysia

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Abstract. Massive Open Online Course (MOOC) has disrupted the worldwide educational system and brought to effective changes in the existing higher education system. Openness, diversity, availability and affordability of MOOC offer participants the high quality learning contents and encourage lifelong learning with technology enhancement. However, MOOC still troubled with pedagogical issues, assessment, students-instructor respond system, limited interaction and low completion rate. Thus, this study aimed to evaluate the effectiveness of MOOCs that has been launched in a higher education institution in Malaysia. This study will discuss the effectiveness of MOOC, based on seven evaluation factors: (1) flexibility; (2) content; (3) pedagogical; (4) lifelong learning; (5) network learning; (6) openness and (7) self-organized learning. Participants are 40 students from a local higher education institution. The analysis of collected data uncovered the extend participants' perception in impacts and efficiency of MOOC for their future learning environment. Overall findings have shown that high satisfaction towards MOOC learning environment, with average mean score of 4.00 and above, especially for openness, flexibility, pedagogical and self-organized learning level of MOOC. Of seven evaluation factors, openness factor has achieved a highest average mean score of 4.59, highest satisfaction level from the students' perspective on MOOC.

Keywords. MOOC; Effectiveness; Higher Education Institution

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1. Introduction

Online education becomes popular and attracts attention from the worldwide, and it also is the latest trend to learn new knowledge via The Internet and social networking [1]. MOOCs become a new character in online education, which offers high-quality contents openly and free of charge and successfully involved the top universities in the world to offer the courses and attract millions of participants to learn it. Some researchers believed that the emergence of MOOC will become disruptive innovations and replace the conventional education system, to address recent higher education high demand problems, decline quality of higher education and high cost to sustain higher education system [2].

Although MOOC's achievements have not been denied, however, MOOC still troubled with several limitations and challenges, which are pedagogical issues [3, 4] regarding to assessment and student-instructor respond system, limited interaction between learners and learning contents, low completion rate with the average 5% of the MOOC participants [3, 4]. Moreover, there is very limited empirical study related to the impacts of MOOC on the learning process and even unsystematic analysis for the instructional quality of MOOC [5]. The recognized quality measurement system also under arguing [2, 5] and critics have been voiced up for the 'quality' issues of MOOC, especially the extraordinary scale of MOOC's implication in learning and education field.

The objectives of this study were to examine the impacts of using MOOC in higher education institution environment, develop a conceptual framework for effective MOOC environment and evaluate the effectiveness of the developed MOOC environment in higher education institution. The purpose of this study was to investigate the efficiency of an MOOC environment in a local establishment. More specifically, this study aimed to examine MOOC students' perceptions on the clusters of MOOC stakeholder perspectives and develop a conceptual framework for effective MOOC environment for higher education institutions. The main research question to guide this study was what is the effectiveness of the developed MOOC environment via a survey study in a local higher education institution?

2. Literature Review

Open Learning website has updated report that there are 42,109 students had participated MOOCs until June 2014 and achieved to 130,854 hours in monthly spending hours for MOOCs [6]. These enormous numbers have shown that MOOC becomes more popular and easy access to publics. There are two types of MOOC, namely xMOOC and cMOOC. xMOOCs are primarily content-based, and instructors use video presentations to teach the course when every student follow their coursework at their own speed [7, 8]. Coursera, eDX, Udacity, Udemy, Khan Academy and Venture Lab are most leading platforms for xMOOCs. Their focus is more on learning than attaining credits or proficiency [7]. cMOOCs also namely connectivist MOOCs, oriented on connectivist distributed peer learning model, typically developed via open source web platforms [7, 8]. cMOOCs allow students determine their own learning goals and learner be free of charge throughout the learning process [8].

From the previous studies, the features of MOOC could be categorized into three points, free

to use, different high-quality courses and lifelong learning. Firstly, MOOCs provide videos free for all registered students in Open Learning website. One of the benefits of MOOCs offered is students just register according to the simple steps and choose whatever they like and want to learn. Secondly, diversity of courses has been provided by MOOCs without limitation of time and pre-requisites. Thirdly, MOOCs offered lifelong learning to students due to continuous learning approach. The application of MOOCs had disrupted recent teaching and learning the process by its simplicity, affordability and customizing.

3. Methodology

This study is a descriptive study and does not have control and treatment groups. Therefore, the non-experimental design is selected for this study. Taylor's University is estimated having 4000 students in population and is a comprehensive private Malaysian university. There are few schools offer MOOCs, School of Computing and IT (SOCIT) have offered 'Mobile Game Development via Game Salad' to all students who attempts to learn simple mobile game programming and development. This school is chosen to conduct the effectiveness evaluation. This school is estimated having 400 students in population.

As mentioned above, SOCIT's students will be randomly selected for this study. The population is estimated, 400 students. Thus, we will choose 40 students randomly as our case study subjects. The sample proportion is the ratio of the sample size to the population size. The sample proportion of the population with the populations size = 400, are equal to 0.1. Since the proportion sample value is more than 0.05 (5%), therefore the number of subjects is sufficient for the study [9].

The instrument used in this study was modified from the questionnaires that are used in the evaluation of bMOOC [4]. This tool was developed based on Conole's 12 dimension rubrics to gauge MOOC usability and effectiveness [4]. There were 50 items will be tested in the questionnaire. A 5-point Likert scale is used from 1-strongly disagree, 2-disagree, 3-neutral, 4-agree and 5 -strongly agree.

4. Findings and Discussion

A quantitative analysis was performed on the questionnaire together with descriptive statistics and the tabulation data. This study was designed to be an initial evaluation of the effects of MOOC to enhance learning in higher education institutions. There were 40 students (32 Male, 8 Female) from Foundation Course in Computing at Taylor's University.

The results of the effectiveness evaluation of MOOCs get great satisfaction from all participants. Figure 1 illustrates the average mean of effectiveness evaluation factors from students' perceptions. From the graph bar, the xMOOCs that offered at Taylor's University is truly open and flexible for students learning. Pedagogical parts of MOOCs are important and obtain high satisfaction from students' perspective. xMOOCs also provide self-organized learning environment too to all participants.
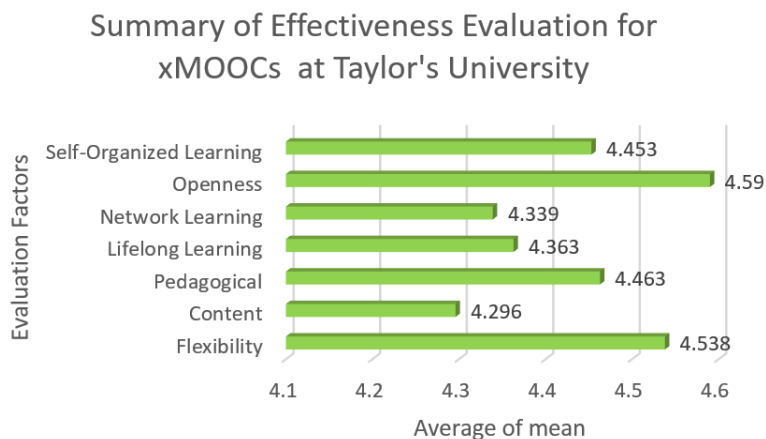
**Summary of Effectiveness Evaluation for
xMOOCs at Taylor's University**

Figure 1. Average mean of seven effectiveness evaluation factors from students' perceptions

The researcher can summarize that the descriptive results of the effectiveness evaluation for MOOCs have shown high satisfaction of the respondents with the level of openness, flexibility, pedagogical, self-organized learning, lifelong learning, network learning and content in MOOCs. With the high agreement of students towards openness level of MOOCs, the offered MOOCs not only enable students free to register for the course without any considering education level, but also allow them to reuse, revise and redeliver the learning contents. These two factors of MOOCs truly contribute to the changes in the local higher education system in future. Times, locations, cultures, education level, academic requirements, and cost are not factors to bond the students learning environment in future.

Pedagogical issues always become the limitations of conducting MOOCs [3, 4]. Effective instructional design and learning method will attract and motivate more participants to join MOOCs [4]. Participants are reacted positively for the pedagogical level of MOOCs, achieved average mean at 4.463, a high mean score after openness and flexibility of MOOCs.

Teacher-centered learning plays a significant role in the conventional higher education system. In this study, self-organized learning is supported by MOOCs, which has achieved mean average at 4.453 and indicated that majority participants agreed that self-organized learning is allowed and supported in MOOCs learning environment.

Lifelong learning and network learning obtained average mean score of 4.363 and 4.339 respectively. These two factors average mean consider lower than other factors. This has shown that lifelong learning and network learning have been agreed that supported by MOOCs, but in lower agreement by the participants. This may cause by students still confusing lifelong learning that supported by MOOCs. However, they are agreed that the skills that learned from MOOCs assist them for future jobs.

Finally, the lowest average mean is obtained by a content factor of MOOCs. All participants are satisfied with the content of MOOCs, especially the video lecture presentation. However, they are less agreed that feedback in MOOCs helps them to reflect on the MOOCs' content. They also less satisfied that browsing the bookmarked articles can assist them to understand better the learning contents.

Although the results of effectiveness evaluation of MOOCs are great and give a very positive impact on the higher education system in Malaysia, the survey may not be enough to represent a comprehensive evaluation study for the effectiveness of MOOCs in Malaysia. Hence, the researcher suggests that there is a need to conduct an experimental study and qualitative study for effectiveness evaluation of MOOCs in Malaysia. Interview with instructors may contribute more qualitative findings for the effectiveness evaluation of MOOCs and help to provide a clear picture of MOOCs' impacts in higher education system in future.

5. Conclusion

In conclusion, the researcher can summarize that this study has significantly proven that the features support the offered MOOCs in the local higher education institution: openness, flexibility, pedagogical, self-organized learning, lifelong learning, network learning and content since there was a broad agreement and satisfaction that shown by all of the participants. It is vital to determine to learn analytic methods and data analytic methods to increase the sustainability of MOOCs in future. Big data is a huge and potential study to improve our study in all fields, including educational and business model.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

All the authors contributed significantly in writing this article. The authors read and approved the final manuscript.

References

[1] G. Grosseck, C. Holotescu, R. Bran and M. Ivanova, A checklist for a MOOC activist, The 11th International Scientific Conference eLearning and Software for Education, April, 23-24, Bucharest, 538 – 543 (2015).

[2] L. Yuan and S. Potwell, MOOCs and Open Education: Implications for Higher Education, JISC Cetis, UK (2013).

[3] O. B. Gene, M. M. Nunez and A. F. Blanco, Gamification in MOOC: challenges, opportunities, and proposals for advancing MOOC model, TEEM 2014, October 01-03, Salamanca, Spain, 215 – 220 (2014).

[4] A. M. F. Yousef, M. A. Chatti, U. Schroeder and M. Wosnitza, A usability evaluation of a blended MOOC environment: an experimental case study, *International Review of Research in Open and Distributed Learning* **16**(2), 69 – 93 (2015).

[5] A. Margayan, M. Bianco and A. Littlejohn, Instructional quality of Massive Open Online Courses (MOOCs), *Computers & Education* **80**, 77 – 83 (2015).

[6] Openlearning.com, retrieved July 31, 2014, from `https://www.openlearning.com/` (2014).

[7] M. H. Baturay, An overview of the world of MOOCs, *Procedia- Social and Behavioral Sciences* **174**, 427 – 433 (2014).

[8] M. Kesim and H. Altinpulluk, A theoretical analysis of MOOCs types from a perspective of learning theories, *Procedia – Social and Behavioral Sciences* **186**, 15 – 19 (2015).

[9] Y. P. Chua, *Mastering Research Methods*, McGraw Hill Education, Kuala Lumpur (2012).