# THE USAGE OF MASSIVE OPEN ONLINE COURSE (MOOC) IN TEACHING AND LEARNING AMONG STUDENTS

**Norhasyimah Hamzah**[*]**, Wan Nurul Asyida Wan Roosli, Mohd Erfy Ismail, Arihasnida Ariffin**
Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia
*hasyimah@uthm.edu

## *Abstract*

**Purpose of Study:** Technology-based education methods have an interest in ensuring Malaysia's position in the global rankings. Furthermore, the government intends to raise the level of online learning globally. Massive Open Online Course (MOOC) is a platform that allows the government's intention to be successfully achieved. This study aims to identify students' level of knowledge on the importance of the use of MOOC and on the application of MOOC in teaching and learning. It also intends to identify the students' level of acceptance of MOOC and the level of its effectiveness in teaching and learning. A total of 247 users of MOOC from Universiti Teknologi Malaysia (UTM) were sampled in this study.

**Methodology:** The data were collected using a set of questionnaire and were analyzed using the Statistical Package for Social Science (SPSSv 21).

**Results:** Results showed that the level of knowledge, usage, acceptance, and effectiveness was high among the students. From the findings, some suggestions were made to future researchers and the parties involved in university management.

**Implications/Applications:** The finding noted a high level of the students' knowledge about the importance of MOOC in teaching and learning, the students' use of the application of the MOOC in teaching and learning, as well as their acceptance on the use of MOOC. This indicates that the use of teaching and learning in blended learning through the MOOC platform can be received by the students.

*Keywords: Technology, Massive Open Online Course, Teaching and Learning.*

## INTRODUCTION

Nowadays, the process of teaching and learning is not limited to a closed space such as a process has changed dramatically (Zahari Hamidon, 2016; Gil, Eduardo González. 2018; Jenaabadi & Shad, 2013) following the usage of technology in education, anywhere and anytime. This new method would encourage students to be more independent and disciplined in their learning process, hence would indirectly make learning more interesting for independent learning. According to (McDermotl, (2013)) as a Massive Open Online Course (MOOC) refers to this new mode of learning.

MOOC is an online course that is aimed at large-scale interactive participation and open access via the web. Other than involving traditional course materials such as videos, readings, and sets of problem, the MOOC also involves an interactive user forum, which would encourage active interactions between students and instructors. In MOOC, students will learn independently and harness their new skills through the use of computer networks and smartphones.

According to (Kim, (2014)) explained that MOOCs is the latest trend that offers open, massive, and accessible education to anyone who registers. Countries including the United States and Canada have been implementing MOOCs. The same popularity reached Germany through the launching of iVersity in 2013. By the end of the year, the programme attracted the attention of a quarter million students. Despite the challenges of cost control particularly in e-Learning, MOOCs have been able to generate returns because of the courses are open to the wider network of participants or students who intend to pursue study with a mode that is more flexible and independent.

According to the Malaysian Education Blueprint (Higher Education), 2015 to 2025, online learning via electronic means is a teaching model that is becoming the primary method for expanding access to education, improving the quality of teaching and learning, and enabling learning to adapt to the needs of students. Two decades into implementation, the Malaysian education system intends to progress towards the next phase of learning based on information and communication technology (ICT) of online learning at a global level (GOL). Malaysia is firm in its quest to ensure that education in the country can compete with that of the great nations. Even ninth surge in the Malaysian Education Blueprint (Higher Education) demand online learning be implemented at a global level. However, the question that arises is whether the implementation of MOOC has improved online learning. The implementation of MOOC in all institutions of higher learning necessitates the understanding of MOOC among students and educators.

Although MOOC is still new, it is said to be commendable in terms of pedagogy and Self-Mastery Driven among students. MOOC requires students to individually control their own learning, and determine when and how they can get involved in the learning sessions. According to (Allison Littlejohn, Nina Hood, Colin Miligan, Paige Mustaiin, 2015). )relates that MOOC has attracted a wide variety of students with different levels of motivation and previous experience. Overall, the efforts for excellence in the use of MOOC courses depend on the students themselves. Problems will occur if the students fail to engage in MOOC actively and do not have proper time management. In such cases, the students will face failure in the course undertaking.

The teaching and learning process through the use of MOOC as a medium is considered informal learning. As (Gutierrez-Santiuste & Gallego-Arrufat, 2015) concluded, students preferred to study formally (face-to-face) through the traditional method's design and planning. They were dissatisfied with informal learning particularly in terms of its planning, design, and evaluation, which indicates that the biggest problem in informal learning is the assessment.

The abovementioned issues necessitate the identification of the use of MOOC in teaching and learning. The use of MOOC is on the rise and the Ministry of Education (MOE) has advised all higher education institutions use MOOC. In order to improve MOOC usage, students' level of knowledge about the importance of MOOC and the type of application in MOOC for teaching and learning process need to be revived, as well as their acceptance in MOOC usage in teaching and learning. Also required is an evaluation of the impact of MOOC among students. The findings can benefit the parties involved especially those in technical and vocational education training (TVET) institutions and universities in order to increase the level of MOOC usage in teaching and learning.

## METHODOLOGY

This study adopted a quantitative approach in descriptive form and the data were collected using a survey form. According to (Chua (2006)) explained that descriptive survey research methods are popular due to extensive use, the similar way of control, the fast means of data collection, and the use of large sample size. Information can be collected directly from survey respondents hence the generalisability of the results. The use of a survey form allowed the researcher to obtain a response from many respondents hence saved the researcher's money, energy, and time in conducting the research. The study involved students in a course that used MOOC as a medium in teaching and learning, which is the Data Structures and Algorithms provided by the management party from MOOC Universiti Teknologi Malaysia (UTM).

### Population and sample

Population refers to the sample units that will be selected based on (Ghauri & Grønhaug (2005)). The population for this study is students who have used MOOC in Data Structures and Algorithms course at Universiti Teknologi Malaysia (UTM). The total number of students registered for the course was 870. According to (Krejcie, & Morgan, (1970)) 274 students were taken from the registered number of students. As mentioned by (Masri, (2005)), a researcher should undertake an inexpensive method of sampling but the samples collected must be adequate and valued. In this study, random sampling was adopted to collect information from a particular group of samples in order to meet the research objectives. A simple random sample selection process is a process in which all individuals in a particular population has an equal chance to be selected as the sample.

### Research Instrument

The questionnaire consisted of several items based on the research objectives. According to (Talib, O. (2013)) recommended the questionnaire method for its ability to obtain response easily from respondents, low cost, and convenience. The questionnaire was adapted from the previous study and approved by four experts. It consists of five sections. The format for the questionnaire is shown in Table 1 below:

**Table.1:** Format Questionnaire.

| Section | Number of Items | Title | Total of Question |
|---------|-----------------|-------|-------------------|
| 1 | 1 – 3 | Demographic Information of Respondent. | 4 |
| 2 | 1 – 5 | Level Knowledge Students About the Importance of Using MOOC. | 8 |
| 3 | 1 – 8 | Usage of application in MOOC among students in Teaching and Learning. | 8 |
| 4 | 1 – 8 | Level of its acceptance of students toward MOOC | 8 |
| 5 | 1 – 10 | Effectiveness of using MOOC | 10 |

Section 2 to 5, Likert scale was used to obtain a response from the respondents. It consists of different weights: Strongly Agree (SA), Agree (A), Uncertain (U), Disagree (D) and Strongly Disagree (SD).

**Validity and Reliability Instruments**

The test of validity and reliability of a research instrument is important in order to avoid the fidelity of the instrument used in a study. To ensure that the questionnaire was reliable and valid, the researcher sought confirmation from four experts in the field of *e*-learning pedagogy in order to ensure that the questionnaire items meet the requirements of the study. The experts were asked to assess the questionnaire in terms of content and presentation of language style prior to the pilot study.

The questionnaire was adapted from those used in previous studies. To ascertain the reliability of the questionnaire, a pilot study was conducted on 30 respondents among MOOC users. In this study, the reliability of the questionnaire, which was related to the use of MOOC in teaching and learning among students, was determined by calculating the Cronbach alpha reliability coefficient. The acceptable Alpha value was set at 0.6 followings (Bond & Fox, (2007).)recommendation that 0.6 to 0.69 be the acceptable level of reliability, whereas values less than 0.60 indicate that the items are similar or overlap each other. Table 2 tabulates these indicators.

**Table 2:** Cronbach Alpha value tables *(Source: Bond and Fox, 2007)*

| Score Alpha Cronbach | Level Reliability |
|---|---|
| 0.90 – 1.00 | Very good and consistent |
| 0.80 – 0.89 | Good |
| 0.70 – 0.79 | Good and acceptable |
| 0.60 – 0.69 | Acceptable |
| 0.5 – 0.59 | Items need to be improved |
| < 0.49 | The item needs to be dropped |

Results from the pilot study show that the items used in the questionnaire are at good levels (Table 3).

**Table 3:** Analysis of Respondent Demographics

| Respondent's Information | | Number | Percentage (%) |
|---|---|---|---|
| Sex | Male | 74 | 27.0 |
| | Female | 200 | 73.0 |
| Age | Under 18 years | 4 | 1.5 |
| | 19 – 25 years | 250 | 91.2 |
| | 26 – 30 years | 13 | 4.7 |
| | 31 and above | 7 | 2.6 |
| Race | Malay | 235 | 85.8 |
| | Chinese | 14 | 5.1 |
| | Indian | 11 | 4.0 |
| | Other | 14 | 5.1 |

Table 4. summarises the findings obtained in section 2, namely the level of knowledge on the importance of MOOC among students.

**Table 4:** levels of student's knowledge about the importance of using MOOC in teaching and learning

| No | Statement | Mean | SD |
|---|---|---|---|
| 1 | I know that the MOOC is a requirement in the teaching and learning of the 21st century. | 4.03 | 0.891 |
| 2 | I know that a lot of learning materials available through MOOC. | 4.01 | 0.922 |
| 3 | I know that the MOOC can help my academic achievements. | 3.91 | 0.877 |
| 4 | I know if I do not know how to use MOOC, I will always face barriers to using it in teaching and learning. | 3.70 | 0.996 |
| 5 | I know that I will miss out in teaching and learning if not using MOOC. | 3.57 | 1.011 |
| | Total score mean | 3.84 | 0.933 |

*N = 274, SD = Standard Division

Table 5.summarizes the findings reported in section 3 of the application in MOOC by the students in teaching and learning.

**Table 5:** Application usage in MOOC by students in teaching and learning

| No | Statement | Mean | SD |
|----|-----------|------|-----|
| 1 | By using MOOC, I can answer online quiz provided by lecturers. | 3.91 | 0.880 |
| 2 | I can use lecture material provided in the MOOC such as notes, video, and audio for my learning. | 3.88 | 0.904 |
| 3 | I can do an online assignment given by lecturers in MOOC. | 3.84 | 0.970 |
| 4 | I can share ideas and opinions with other colleagues with the MOOC. | 3.80 | 0.921 |
| 5 | I can put and change the m yprofile in the MOOC. | 3.79 | 0.944 |
| 6 | I can download lecture materials available, such as notes, video, and audio in the MOOC for my learning. | 3.77 | 0.962 |
| 7 | I can upload lecture notes and learning materials with other people by using MOOC. | 3.72 | 0.893 |
| 8 | I using the comments field provided in the MOOC to make discussions with colleagues and lecturers. | 3.53 | 1.087 |
|  | Total score mean | 3.78 | 0.946 |

*N = 274, SD = Standard Division

Table 6.the findings reported in section 4 on the level of acceptance of MOOC among the students.

**Table 6:** Item level acceptance use of MOOC among students in teaching and learning

| No | Statement | Mean | SD |
|----|-----------|------|-----|
| 1 | I found using MOOC, I can learn at any place as long as there is an internet connection | 4.07 | 0.889 |
| 2 | I like to use MOOC as I can learn at any time to suit my time. | 3.94 | 0.920 |
| 3 | I enjoyed using the MOOC learning openly because it is free (no fees apply) | 3.93 | 0.946 |
| 4 | I feel the use of MOOC helped me to understand easily on my learning in the course I was learning. | 3.83 | 0.883 |
| 5 | I like to use MOOC because I can choose any course that I like to learn. | 3.82 | 0.937 |
| 6 | I like to use MOOC because save the learning cost (can download learning materials and notes) | 3.81 | 0.970 |
| 7 | I love to use because there are many options MOOC courses in it. | 3.80 | 0.966 |
| 8 | I like to use MOOC in the process of teaching and learning | 3.63 | 1.009 |
|  | Total score mean | 3.81 | 0.938 |

*N = 274, SD = Standard Division

Table 6.the findings reported in section 4 on the level of acceptance of MOOC among the students. Table 7.summarizes the findings obtained from section 5 on the impact of MOOC on teaching and learning among the students.

**Table 7:** Item level of impact use MOOC

| No | Statement | Mean | SD |
|----|-----------|------|-----|
|  | After following the teaching and learning in MOOC, I found that MOOC successful makes me a: | | |
| 1 | can communicate with friends from various races and various countries | 3.90 | 0.871 |
| 2 | skilled in the use of online learning applications. | 3.88 | 0.826 |
| 3 | can deliver opinions in a discussion | 3.85 | 0.864 |
| 4 | can give the ideas in a discussion | 3.84 | 0.849 |
| 5 | easy to understand for any course of study in the MOOC because I can control my own learning. (Examples can replay the video many times) | 3.78 | 0.852 |
| 6 | can cooperate with the new people in a group | 3.76 | 0.890 |
| 7 | an active student in the classroom. (For example, inquiring; cooperate in a group) | 3.76 | 0.880 |
| 8 | ability using imagination to get creative ideas | 3.74 | 0.902 |
| 9 | can negotiate with anyone who enrolls in the MOOC courses. | 3.72 | 0.912 |
| 10 | dare ask the instructor/lecturer on matters that are poorly understood | 3.70 | 0.913 |
|  | Total score mean | 3.79 | 0.876 |

*N = 274, SD = Standard Division

**FINDINGS AND DISCUSSION**

The descriptive analysis concluded that overall, the students' level of knowledge about the importance of MOOC in teaching and learning is at a high tendency level. This indicates that they have much knowledge on the importance of using MOOC, therefore the MOOC is considered positive for use in education. MOOC is an alternative that can be used

as a pedagogical tool for teaching in the twenty-first century. The use of computers and the internet in addition to other electronic equipment for teaching and learning in this era. The students acquired much knowledge about MOOC because in the blueprint (Higher Education) 2015–2025, the government actively promotes online programmes to establish national platforms, shared service for academic staff, and MOOC development coordination, as well as build partnerships. Hence, each university has been actively developing its own MOOC. Furthermore, MOOC has received much media attention recently, and it has been portrayed by some as a "revolution" (Friedman, (2012, May 16).)and "noble"(Caplan, (2013, June 6).). Therefore, students of this century should have knowledge of MOOC so that they can use MOOC in teaching and learning.

This is in line with the views of (Jamilah, Hasrina, Hamidah & Juliana (2011)) who explained that the importance of knowledge as knowledge is the capacity to acquire, retain, and use information–a mixture of understanding and experience, knowledge, and skills. The finding also shows the students' tendency to use applications in the MOOC was at a high level. MOOC provides several applications, the most frequently used being the applications that include online quizzes. The students also used the comments field to act as a forum for discussion, which allowed them to engage with each other and exchange knowledge and ideas or create a sense of community (Hollands, & Tirthali, (2014).). MOOC usage in teaching and learning was encouraged in order to enhance the twenty-first-century learning. In addition, in the Blueprint (higher education) 2015–2025, the use of the integrated learning model (blended learning) is promoted as the main pedagogical approach in all institutions of higher learning.

The finding also indicates that students' level of acceptance towards MOOC was high, a finding that corresponded to (Bove, de Leval, Migliavacca, Balossino, & Dubini, (2007).), who found that to students who use the computer in an enjoyable manner and who do not fear the computer, considered computer as important and useful in their everyday life, and they believed that the computer has a positive impact on individuals and society. The students believed that by using MOOC, they can learn anywhere as long as there is an internet connection. This means that the learning was not limited in terms of time and place. The students can also take a course from a distance and from wherever they are (Duratul (2013)). In addition, one of the aspects of MOOC preferred by the students was the fact that the course is free. (O'Connor, (2014, January 23)) named the year 2012 as the "Year of the MOOC" because teaching and learning materials were available for free and the year opened the "door" to a group of elite universities to accept more potential students. Indeed, many MOOC platforms offer a variety of courses from leading universities of the world for free (Pappano, (2012)). A report presented by edX (2012) as cited by (Parker, dan Cho, (2007)) showed that a large number of participant in free online courses are more likely to review their teaching materials and learning that are loaded in the portal only rather than to complete the course until they obtain the certification of completion for the course.

The finding indicates that the impact of the use of MOOC in teaching and learning was also high. After using the MOOC, the students found improvement in themselves. They were able to communicate with friends from various races and countries. The concept of MOOC is openness at a large scale and thus it allows users to have contacts not only from Malaysia but also from all over the world. This indicates that the students have good communication and interpersonal skills after using the MOOC. The use of ICT in teaching and learning were also found to have a positive impact on the students. The online learning allowed the students to observe silently and passively, and the classroom turned active in a virtual environment. The students were also found actively contributing their ideas such a behavior has been observed by previous researchers including (Ahmad, Abbas, Wan-Yahaya, dan Abdul-Salam, (2012);Atan, dan Badusah, 2013;Harris, 2012; Nikiforova, & Ignatiev, 2016; Iravani & ShekarchiZade, 2014) and (Loving, dan Ochoa, 2011; Muyambiri, and Chabaefe, 2018;Azman (2014);Yu-Ling Lin, Hong-Weng Lin, Tzu-Ting Hung (2015)). Open Learning is expected to develop more responsible, independent, and self-sufficient students who can compete in the international arena 25. In addition, 26 stated that students who learn through MOOC can improve their problem-solving skills.

## CONCLUSION

The finding noted a high level of the students' knowledge about the importance of MOOC in teaching and learning, the students' use of the application of the MOOC in teaching and learning, as well as their acceptance on the use of MOOC. This indicates that the use of teaching and learning in blended learning through the MOOC platform can be received by the students. The twenty-first-century education requires the use of technology in teaching and learning pedagogy. MOOC is one of the platforms that are appropriate in the era of rapidly changing technology. It carries the concept of learning across the border with no age limit set, and cost burden can be reduced. MOOC has the potential to transform the conventional or traditional learning style to a style of modern and high-tech learning. From the aspect of fulfilling the needs of the learning process of all time, MOOC is able to provide content that is freely available in a variety of

platforms. MOOC also gives the chance to students to explore the world outside through internet technology. Internet is rich in knowledge that needs to be mined and refined by the students.

Next, based on the results, the researchers made several proposals and recommendations for consideration by the parties concerned. The universities management may establish an organization or a responsible body for managing the MOOC in order to ensure its consistent running. Such an organization is vital for managing MOOC particularly in constructing the content in MOOC. In addition, university lecturers may propose the use of teaching and learning methods that are appropriate for students. In the twenty-first century, students are more exposed to the methods for self-learners, particularly with the use of technology. Therefore, lecturers should switch from conventional methods to new methods such as MOOC. The use of MOOC can help students in their academic achievement. As for students in the twenty-first century, they must be sensitive to changes in technology in teaching and learning in order to keep abreast with the development of technology.

In this century, the use of the internet and online learning is so prevalent. In fact, students in this century are said to have a computer or even a smartphone that allows them to use these tools as a means to assist in teaching and learning.

## ACKNOWLEDGMENTS

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