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Undergraduates' experience and satisfaction of massive open online course in Malaysia

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ABSTRACT

While massive open online course (MOOC) is gaining popularity, studies have shown how negative user experience of the learning platform can lead to issues related to poor learning performance. OpenLearning, as the official national coordinated MOOCs program for higher education institutions in Malaysia, is still considerably gaining momentum in this country, thus much can still be observed in the usability aspect of this platform from the student's perspective. This study aimed to evaluate the aspects of user experience and learning satisfaction of MOOC OpenLearning involving undergraduate students in a public university in Malaysia. Data were gathered through the online survey method which adapted questions from the user experience questionnaire (UEQ) and the usefulness, satisfaction, and ease of use (USE) questionnaire. Descriptive analyses revealed moderate positive levels of user experience and learning satisfaction towards MOOC OpenLearning among the respondents. Furthermore, there was a significant positive correlation between both factors, suggesting the importance of considering user experience as the key factor in enhancing students' satisfaction with MOOC. Recommendations arising from the students' perceptions and concerns on the usability aspect contribute towards developing strategic guidelines for enhancing students' learning experiences, especially during circumstances that necessitate effective online learning strategies.

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1. INTRODUCTION

In the online learning environment, user experience refers to more than just the visual interface of the educational materials. The main focus is always on the presentation of the content and, at the same time on creating an engaging learning experience for the learners in their learning activities [1]. Likewise, students' satisfaction with their learning experience is a multifaceted aspect that relates to the quality of both teaching and learning outcomes. In today's setting, regardless of the medium, almost all forms of teaching and learning will include a certain level of digitalized elements [2]. This implies the need to understand both learning satisfaction and user experience aspects of online learning content.

The coronavirus disease pandemic which has occurred since late 2019 (COVID-19) led to physical and socio-economic challenges in various sectors. The higher education sector globally has taken immediate measure by moving from face-to-face education to online technologies for teaching and learning. Online

learning thus appears to remain dominant in 2020 and beyond, and it is equally critical to prepare towards the use of advanced digital applications and approaches for sustaining relevant teaching and learning practices in higher education. Accordingly, massive open online courses (MOOCs) are increasingly used as teaching-learning approaches in higher education institutions globally. MOOCs have now gained a new level of attention as one of critical learning resources for students who seek to upgrade their skills and improving career and academic levels. In Malaysia, OpenLearning.com is the official MOOC platform used for public higher education institutions as part of the government's effort to further implement online initiatives for higher education sector [3].

With such high level of MOOC adoption in higher education sector, there has been a growing body of research that looked into various aspects of MOOCs implementation. User experience and satisfaction are some of the aspects which are critically important for MOOCs [4]. Current research explored the aspects of user experience and satisfaction of the platform by utilizing survey or online review methods to elicit empirical evidence for statistical analysis and natural language processing inputs [5]. For example, many studies have reported the link between students' successful experience in learning through MOOCs and their better engagement in the learning tasks [6]–[9]

Despite the great changes and focuses on MOOC development and implementation, the issue remain that students' online learning experiences and satisfaction are still critically important to be addressed, especially because they are key stakeholders in effective educational delivery. Reportedly, studies have shown that one of the challenges in using online technologies for learning is related to the students' learning experiences through such approach [10]. For MOOCs, studies have shown how students are challenged due to Internet connection issues, lack of interaction and learning feedback, as well as other technical constraints [11]–[14]

User experience, or sometimes termed as UX, refers to an individuals' perceptions and responses resulting from their use or anticipated use of a particular product, system or service [15]. It can be measured during or after users have experienced in using the system [16]. User experience also relates to usability, which is a more specific measure in the broader context of user experience, comprising five components, i.e. learnability, efficiency, memorability, errors, and satisfaction [17].

In online learning, user experience is just as important as the content design. The usability of the MOOC interface can be perceived differently by users with diverse levels of completion and background [18]. User experience is always seen in both objective parts of the system, such as usefulness and efficiency, and subjective parts, such as attractiveness and satisfaction [19]. Various studies discussed the varying aspects related to user experience in MOOCs, such as in terms of in the aspects of usefulness, usability, desirability, findability, accessibility, and credibility [7], usability testing [18], user-centered design strategies [20], and system design [21].

Students' learning satisfaction is a complex, multi-faceted aspect which reflects their learning experience [22]. Learning satisfaction was described as learners' pleasure due to specific learning activities suggested by the curricular designs that lead to fulfilling their initial learning needs. From online learning perspective, it refers to the "aggregate feelings or affective responses to distinguishable factors while interacting with the e-learning system" [23]. Students' online learning satisfaction may encompasses aspects of learner relevance and autonomy, technology competence, as well as active and authentic learning [24]. In MOOC perspective, students' learning satisfaction may relate to certain learner-level and course-level factors which can also predict the relative impacts [25]. Numerous studies in the literature have reported the significance of students' satisfaction towards their online learning experience in promoting successful educational delivery. For instance, multiple studies have shown the link between higher level of student satisfaction and their higher academic performance [26], teamwork, team performance, collaborative learning [27], and participants' level of involvement in the massive courses and perceived learning benefits [28].

Factors influencing students' learning satisfaction towards online learning include educational experience and quality of both facilities and services [29]. Students' learning satisfaction may also be impacted by their varying learning need and activities [30]. In terms of MOOC learning, students' satisfaction was found to have significant link to various factors such as course instructor, content, assessment, schedule [25] and task-technology fit [31].

In addition, while the aspect of user experience is widely used in activities of evaluating and optimizing research of more commercial products, such work are still not very much focusing on online education [5]. In Malaysia, there is a lack literature that looked into aspects related to undergraduate students' use and application of MOOC, such as in terms of readiness [32]. Despite its significance, the Malaysian undergraduate students' perspective as they are continually required to learn through the platform has received little attention in the current literature [8], [33], [34]. Thus, it seems timely and beneficial to address the aforementioned research gap by studying the aspects of undergraduates' experience in learning through MOOC, and also how this factor is linked to their learning satisfaction. This study was conducted to address

the research question of do the undergraduates' perceived experience in learning through MOOC OpenLearning influence their learning satisfaction.

2. RESEARCH METHOD

This exploratory study was mainly quantitative whereby primary data were gathered through the online survey method. This study involved 15,344 students who were enrolled in various undergraduate courses at a public university in Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM). In detail, survey invitations were sent to all student email lists across the university's faculties. Students were given the option to answer and submit the survey at their convenience if they chose to participate in the study. The sampling method employed was convenience sampling. In this non-probability sampling approach, study subjects or participants were selected based on their availability in the identified location, such as a hospital, and depended on their willingness to participate in the research [35]. The sample size for this study was determined to be N=377 by referring to the Krijcie and Morgan table [36]. According to the table, when the population size is above 15,000 with a 95% confidence level, the required sample size is 377 [36].

Primary data were collected by using a quantitative survey containing three sections with closed-ended questions, which are demographic information (such as age, gender, ethnicity and others), user experience, and learning satisfaction. In measuring user experience, this study utilized eight questions adopted from the short version of user experience questionnaire (UEQ), i.e. UEQ-S. UEQ was originally developed by Laugwitz *et al.* [18] to assess users' subjective impression about their user experience of a particular product. The first four items in the UEQ-S represent the scale of pragmatic quality such as ease of use and efficiency, while the last four items are for the scale of hedonic quality such as attractiveness and inventiveness [37]. As for the learning satisfaction variable, the aspect was assessed through seven questions which were adopted from the usefulness, satisfaction, and ease of use (USE) questionnaire [38]. Satisfaction is one of the four dimensions included in the USE questionnaire which measures usability of a system, tool, or application from the user perceptions. All questions in this section were measured using five-point Likert scale, ranging from scale '1' (strongly disagree) to scale '5' (strongly agree).

University ethics approval was initially obtained before the study was implemented. Prior to the main data collection, a pilot study was firstly conducted to confirm the reliability and validity of the survey items. Statistical reliability test was conducted to measure the internal consistency of all the study variables. The Cronbach's alpha values for both variables ranged between 0.9 to 1.0 (i.e. .947 for user experience variable and .978 for learning satisfaction variable), which exceeded the conventional minimum of 0.70 for reliability [39]. Thus, both study variables were deemed to be reliable.

Following the pilot study, the online survey form was further developed and finalized through the Google Form application. The generated survey link was then disseminated to the list of students' emails. For ethical consideration, the survey form began with clear statements indicating general background of the study as well as relevant information about the students' participation. In a research, ethical consideration should provide explanation to the study participants about the benefits, rights, and procedures done by the researchers in order to protect the participants' identity [40]. Finally, a total of 435 survey responses were received and recorded for further data analysis process.

IBM SPSS software was used to organize and analyze the survey data, involving the statistical analyses for reliability, descriptive, and Pearson correlation analysis. Cronbach's alpha values were firstly calculated to measure the internal consistency of all variables. Following this, common descriptive statistics, i.e. frequencies and means, were performed from the survey data in order to reveal the respondents' demographic profiles, the level of user experience and learning satisfaction in the use of MOOC OpenLearning. The Pearson correlation coefficients were calculated to observe the significant relationship between user experience and learning satisfaction variables. The degree of students' user experience and learning satisfaction has implications for further design and development of teaching-learning applications through the MOOC platform.

3. RESULTS AND DISCUSSION

3.1. Demographic profiles

A total of 435 Universiti Tun Hussein Onn Malaysia undergraduate students provided responses through the online survey. In general, the respondents were considerably equally distributed by gender where 55.9% were female (n=243) and 44.1% were male (n=192). In terms of ethnicity, the largest group was comprised by Malay (n=331; 76.1%), Chinese (n=61; 14%) and Indian (n=32; 7.4%). The other 1.8% (n=8) were of other ethnic groups. As for age, almost all of them (n=353; 81.1%) were 20 to 24 years old. A total

of 16.8% (n=73) were younger, i.e. below 20 years old. Meanwhile, few others were between 25 to 29 years old and 35 years old and above (1.8% and 0.2% respectively).

In terms of study profiles, majority (n=217; 49.9%) were studying in their first year when the study took place. This was followed by those in second year (n=187; 43.0%), third year (n=23; 5.3%), and fourth year (n=8; 1.8%). With regards to the field of study, almost 50% were undertaking engineering courses (n=217), while 45.3% were taking technology-related courses. The remaining (n=21; 4.8%) were studying technical and vocational education course.

3.2. The link between students' user experience and learning satisfaction

Pearson correlation analysis was done to study whether there is a significant relationship between both variables in this study, namely students' user experience and learning satisfaction. The results in Table 1 confirmed that there was a significant positive relationship (coefficient was .543 at 0.01 confidence level) between both variables pertaining to the use of MOOC at the university. Therefore, it can be concluded that the user experience factor seemed to have a significant influence on students' satisfaction in learning through the use of MOOC OpenLearning.

Table 1. The link between students' user experience and learning satisfaction

		User experience	Satisfaction
User experience	Pearson correlation	1	.543**
	Sig. (2-tailed)		.000
	N	435	435
Satisfaction	Pearson correlation	.543**	1
	Sig. (2-tailed)	.000	
	N	435	435

**Correlation is significant at the 0.01 level (2-tailed)

3.3. Discussion

The correlation analysis in this study revealed a significant positive relationship between user experience and learning satisfaction variables. Therefore, it can be suggested that the students' experience in learning through MOOC OpenLearning can play a significant role in determining their learning satisfaction. These findings comply with studies that showed the influence of aspects related to students' user experience on their learning satisfaction through MOOC [10], [11], [41], [42]. For example, a study observed that students with a lot of experience in learning through MOOCs showed the highest positive perception scores [42]. On the contrary, another study observed that students with less experience might not fully satisfied and find that learning through MOOC is less useful, especially due to the lack of instructor-student interaction [43]. Several aspects of perceived usability, i.e. easiness, attractiveness, and accessibility, were found to have a significant positive relationship on students' satisfaction in using MOOC [10]. Another related study also observed that students' higher level of engagement through online learning have resulted in their higher levels of satisfaction [41].

Thus, this study supported that the way students view how certain teaching and learning tools are useful and beneficial for them can influence their satisfaction towards its educational use. Users' positive experience with usefulness will induce greater user satisfaction towards their MOOC learning experience [44]. As claimed in study that looked into students' use of MOOC, students who have positive perception about the beneficial use of a technology in performing individual learning tasks and activities are more likely to be feel satisfied with it [11]. Students' interest has a significant influence on their satisfaction in MOOC which is easily established when they find experience as fun or enjoyable through the online courses [45].

On another aspect, a positive student experience in online learning, which includes user-friendly technology, well-structured course content, meaningful interaction with instructors and peers, timely feedback, instructor presence, flexibility, robust support services, collaborative opportunities, accessibility, clear communication, personalization, and motivation, is critical for satisfaction [46]. When these elements are effectively integrated into the online learning environment, it increases student engagement, fosters a sense of community, and ultimately leads to higher satisfaction levels, better learning outcomes, and higher retention rates, highlighting the importance of continuous assessment and adaptation to meet the evolving needs of online learners [47], [48].

4. CONCLUSION

Overall, the findings showed students' satisfaction towards MOOC OpenLearning was significantly correlated to their user experience, suggesting user experience as an essential element in determining

successful MOOC implementation in higher education. The emerging issues on attractiveness, fun features, and other usability attributes have also provided direction for improvements of teaching-learning practices. Despite the finding, this study is limited since it only involved undergraduate students from one public university in Malaysia, its findings cannot be generalized to represent the whole population of higher education students in the country.

Thus, future studies could be replicated to other higher education institutions to obtain more comprehensive findings on the usability of MOOCs. This study is also limited in a way that most of the students were mainly undertaking technical-related study programs, due to the nature of the university itself. While this background might offer an interesting research perspective, it would also be more relevant to conduct the research across various fields of study, such as arts and sciences, in order to investigate how different student cohorts might have responded to the survey, especially when such inputs are contextualized by study disciplines.

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