Investigating Relationship Among Learning Self-efficacy, MOOC-satisfaction and MOOC- Loyalty of MOOC Learner Using Bagozzi's Self-regulation Model

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Abstract
This research aims to examine the relationship among Learners' self-efficacy, MOOC-satisfaction and MOOC-Loyalty of the credit-bearning MOOCs at Taylor's University using Bagozzi's self-regulation Model. Online questionnaire included 10-item of learning self-efficacy, 6-item of MOOC-satisfaction, and 5-item of MOOC-Loyalty. It also included another two factors which affected the learning self-efficacy and MOOC-satisfaction: 9-item on Ease of learning and 5-item on Quality of MOOC content. Pearson correlation coefficient between pair of variables among all the variables were obtained. The results of zero order correlation analysis showed a strong positive correlation between the predictors and outcome variables. The research findings provided positive impact to lecturers who plan to convert from traditional teaching pedagogy to MOOC mode as Malaysian students have higher degree of MOOC-loyalty and they were in favor of continuing to take up the credit bearing MOOC throughout their study at Taylor's university. Besides, it also alarmed the university administrator to provide the best infrastructure for the MOOC platform and best quality of MOOC content so as to raise the MOOC-satisfaction which enhance the MOOC-loyalty.

Keywords: Massive Open Online Course (MOOC), MOOC-satisfaction, MOOC-loyalty, Learning self-efficacy

Introduction

Massive Open Online Course (MOOC) has become one of the common phenomenon in higher educational Institutions (HEI) globally. MOOCs have drawn attention of educators and educational providers since 2008 with the inception of cMOOC by the young researchers George Siemens and Steven Downes. In 2011, another version known as xMOOCs which emphasized on individual learning was introduced. The educational landscape particularly in the higher education has changed drastically since the inceptions of xMOOCs. According to Class Central's MOOC report (2018), more than 900 Universities in the world had announced or launched 11400 MOOCs, with around 2000 new courses added to the list in 2018. It also reported that there are 20 million new learners signed up for at least one MOOC in 2018, which make the number of learners to a total of 101 million since 2012.

It is undeniable fact that the educational landscape has been changed dramatically due to the mushrooming of xMOOCs in the HEIs globally. According to Balaii,(2013), MOOC is increasingly gaining its popularity in many developing countries which has well developed digital infrastructure, particularly in area of metropolitan and universities. The waves of MOOCs have started to propagate into Malaysia since the inception of cMOOCs in 2008. A study done by Norazah, Mohamed Amin, and Zaidan (2011) found that 11 HEIs in Malaysia offered more than 50% of their courses online, 13.8% of lecturers provided more than 80% online learning materials and that 44.6% of students preferred to read materials uploaded by their lecturers. Their findings have shown that students' preference for online courses was very encouraging. In fact, lecturers also agreed that the integration of e-learning into their courses has benefited students. In general, it clearly shows that MOOCs are accepted by lecturers and students of HEIs as an effective means of communication and teaching and learning.

Malaysia has become the first country in the world to implement credit-bearing MOOCs for university students to enroll to the compulsory courses in its Public Universities since 2014 and develop a national policy on credit recognition for the MOOCs in 2016. Since then, many public and private universities in Malaysia have started the MOOC initiatives in general studies modules on a partial implementation basis. Many public universities have claimed to start the piloted MOOC initiatives for the general studies modules which include Hubungan Etnik (Ethnic Relation) and Tamadun Islam dan Tamadun Asia, TITAS (Islamic Civilization and Asian Civilization). However, the initiative to offer MOOC delivery of the two modules in the public universities were conducted as a blended learning course with 30% of the course conducted in MOOCs while the remaining percentage was carried out according to course instructors (Norazah Nordin, et. al., 2015).

Taylor's University in Malaysia had begun to develop modules in MOOC since 2013. It appeared as the first University in Malaysia to offer MOOCs with 100% online delivery to replace the traditional face to face approach to its two general study modules in 2016. The two compulsory general studies modules are Hubungan Ethnik (Ethnic Relations) and Tamadun Islam dan Tamadun Asia, TITAS (Islamic Civilization and Asia Civilization). These two modules have large enrolment, each module has more than 1200 students for each semester and all Malaysian students need to undertake and pass these two modules before they receive their degree.

Problem Statement

Taylor's University has implemented its new curriculum in 2018, known as Taylor's Curriculum Framework (TCF), which aims to future-proof graduates to be ready for the Fourth Industrial Revolution (IR 4.0). TCF helps to prepare graduates to be ready in different jobs in the future by training them to be able to learn for themselves in a life-long learning manner after they graduate from university. To achieve this goal, the TCF adopts a 'teach less, learn more' philosophy where face-to-face lectures will be gradually reduced from the first to third year to build students' independent self-learning and peer learning abilities. More and more modules are turning into credit-bearing MOOCs. This effort will train graduates to go online and take a MOOC course in preparation to move from one job to another job in future. However, despite the fact that today's kids are born digital—born into a media rich, networked world of infinite possibilities, their formal education and learning environment prior to enrolling into university are still "passive and in teaching paradigm" and conducted in the traditional face to face approach. University students may face problems with such a drastic change from a conventional face to face education environment into the new learning paradigm, such as losing confidence and not satisfied in learning, which may lead to the anxiety or denial to learn MOOCs in future. It is important to note that MOOC-loyalty and MOOC-satisfaction play an important role in the successful future adoption of learning via MOOCs platform. In response to these problems, this research proposes to investigate relationship among learning self-efficacy, MOOC-satisfaction and MOOC-Loyalty of MOOC learners at Taylor's University.

Literature review

A paradigm shift of social networking relying heavily on information communication technology and ubiquitous computing are beginning to set a profound impact on teaching and learning strategy, and most prominently, on the evolution of new educational landscape offer to our Millennial learners. With this new paradigm of open and online education, learning and knowledge acquisition is no longer restricted and confined within walls and classrooms. Learning can now take place anytime, anywhere one's own pace and convenience whenever there is penetration of radio waves and coverage of WiFi with the aid of online learning. With this development, MOOCs have drawn attention of researchers and stakeholders in higher education sector. Mawaddah (2018) suggested a conceptual model to identify the factors that determine users to continue to select modules offer in MOOC for their learning platform. The model demonstrates the relationship between usefulness, enjoyment, interactivity and openness with MOOCs continuance intention. The research model focused on post adoption usage by examining the continuance intention of Malaysia MOOCs system. Continuance intention is somehow related to MOOC-loyalty as Lee & Kwon (2011) stated that continuance intention describes about user's decision to continue to use a specific technology that users have already been using it. By far, the model has yet to be tested with concrete data. Anderson (2003) investigated the impact of satisfaction on loyalty in the context of electronic commerce. The research indicates that e-satisfaction has impacted e-loyalty, and the relationship is moderated by some other business factors such as trust and perceived value. Even though the research is not directed to MOOC adoption, however its research constructs such as e-satisfaction and e-loyalty can be replicated in MOOC-satisfaction and MOOC-loyalty with academic factor such as learning self-efficacy, ease of learning and quality of

MOOC contents. Polites (2012) proposed a research model on the relationship between e-satisfaction and websites stickiness (another term related to e-loyalty) grounded on Bagozzi's 1992 framework of the self-regulation of attitudes, intentions, and behavior. His research focused on consumer perceptions of satisfaction with, and loyalty toward the information technology (IT) artifact (website) itself. The results obtained generally support the proposed model, indicating a statistical weak relationship between the e-satisfaction and e-loyalty (Site stickiness). Cui (2018) explored the relation between multidimensional self-efficacy and MOOCs continuous learning willingness by building his research model based on Expectation Confirmation Model-Information Technology proposed by Bhattacherjeethe (2001) who stated that success of IS not merely depended on initial use, the key was the continuous use (which is similar to e-loyalty). The questionnaires in his study consists of items related to sense of competence, sense of identification, sense of performance and sense of control, together with items related to self-efficacy, satisfaction degree and MOOCs continuous learning willingness in the form of 5-point Likert scale. This empirical research concluded that self-efficacy and satisfaction degree of MOOCs learners have a significant positive impact on their continuous learning willingness. Bear in mind that MOOC-loyalty and MOOC-satisfaction play an important role in the successful future adoption of learning via MOOCs application.

Purpose of study

In view of the literature based on various study on factors affecting loyalty, it seems a research gap exists in the research on the relationship among the three constructs in the education landscape with the adoption of MOOCs, which are learners' learning self-efficacy, MOOC-satisfaction and MOOC-loyalty. Moreover, the problem statement stated in the earlier section has prompted an urgency to study the relationship among these constructs.

This research sought to address the research gaps in the literature and enhance the future adoption of learning via MOOCs platform by exploring the relationship among the Learners' self-efficacy, MOOC-satisfaction and MOOC- Loyalty of the credit-bearning MOOCs at Taylor's University.

Theoretical framework

This research adapts and adopts Bagozzi's (1992) "self-regulatory process" framework which stimulate intentions, cause enactment of behavior and lead to goal attainment. The process acts in monitoring appraisal and coping activities that translate attitudes into intention (appraisal process), intentions into actions (emotional reaction) and leading to goal attainment (coping responses). The emotional self-regulation of the attitude intention relationship Model (include "self-regulatory process" framework) is represented as shown in figure 1. This framework conceptualize attitude as an evaluative appraisal of the consequences of action. The appraisal is either favorable or unfavorable. Following the appraisal, intentions are expected to emerge with the evaluations results. To form an intention to act requires a desire to perform the act, together with the presence of self-efficacy. Positive or negative reaction are expected to occur depending on the appraisal outcomes. The emotional reaction in turn, induce coping activities. These coping activities again

includes motivation to avoid, relieve, change in the negative aspect or maintain the satisfaction, share positive outcomes with others or savor the experience in the positive aspects.
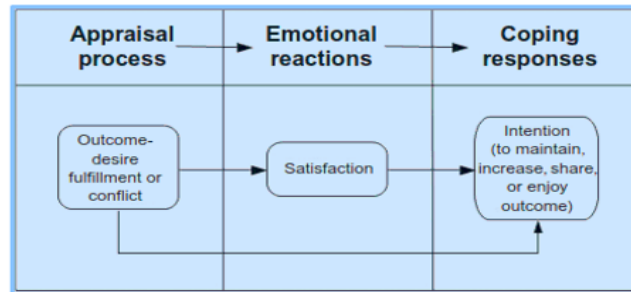

Figure 1: Emotional self-regulation Model (Bagozzi ,1992).

Figure 2 shows the proposed research model of this study adapted and modified from Bagozzi's (1992) emotional self-regulation of the attitude intention relationship Model. The appraisal process in this model involves the learning self-efficacy which addresses the evaluation of resources in MOOC with regards to quality of MOOC content and Ease of learning. Consider a MOOC learner achieves a goal or experiences a pleasant event, with high level of learning self-efficacy, an outcome-desire fulfillment is said to occur. This experience will lead to MOOC-satisfaction. Specific intentions probably will emerge to take step to maintain or increase MOOC-satisfaction by sharing experience with others. Thus, the specific coping responses will depend on the particular emotion, and the degree of learning self-efficacy characteristic of the outcome-desire unit. As a results, MOOC learner will choose to take up another credit-bearing MOOC modules in the university or after graduation while changing a new job. This is translated as MOOC-Loyalty.
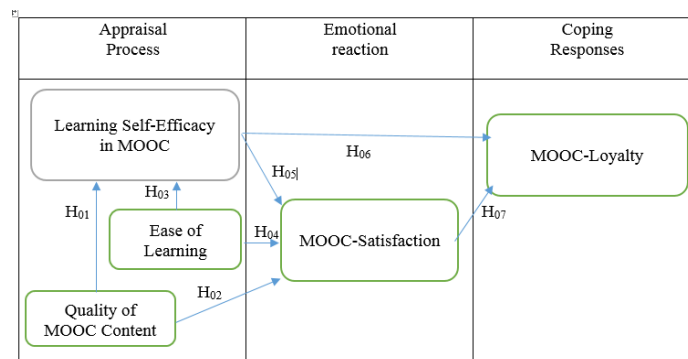

Figure 2: Proposed research model to Exploring relationship among Learners' self-efficacy, MOOC-satisfaction and MOOC-Loyalty

Learning self-efficacy in MOOC

Bandura (1994) defines Self-efficacy as people's beliefs about their capabilities to produce expected outcomes. Learning self-efficacy in MOOC refers to learners' confidence in learning a module in the MOOC environment, with regards to the ease of learning and quality of the content presented in MOOC.

MOOC-satisfaction

Satisfaction is essential to any form of service provider. Oliver (1997) defined satisfaction as "the summary of psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with a consumer's prior feelings about the consumer experience". MOOC-Satisfaction in this study refers to learner's satisfaction with regards to ensuring his effective learning and increases his competence which would guarantee his proper function in an online or MOOC learning environment (Muylle, et.al, 2004).

MOOC-Loyalty

Brand loyalty is defined as "the preferential, attitudinal and behavioral response toward one or more brands in a product category expressed over a period of time by a consumer" (Engel, Kollat, and Blackwell, 1982). In e-business, e-loyalty is defined as the customer's favorable attitude toward an electronic business resulting in repeat buying behavior (Anderson, 2003). MOOC-loyalty is defined as MOOC learner's favorable attitude toward learning a module in a MOOCs environment resulting in MOOC learner to repeatedly enroll to another credit-bearing MOOC in the university or after graduation while changing for a new job.

Method

Study Design

The present study adopted the quantitative approach and correlational design to explore the relationship among students' Learning self-efficacy in MOOC, MOOC-satisfaction and MOOC-Loyalty

Sample

A convenient sample of students was used to investigate the relationship among the variables. 952 Taylor's University students are expected to respond to the online survey, 195 students from the March 2018 semester (pilot study sample) have responded while 757 students from August 2019 Semester have identified and promised to respond by end of December 2019. These students were studying in various faculties. There were 458 students enrolled to the Tamadun Islam and Tamadun Asia or TITAS and 493 students enrolled to Hubungan Etnik or HE. The sample comprised of 502 female students and 450 male students. The age of the students ranges from 19 year old to 22 years old.

Procedure

This study was carried out from March 2018 Semester (pilot sample) to August 2019 Semester for a period of 2 semesters at Taylor's University. Duration of each semester were 14 weeks. The TITAS and HE modules were conducted via MOOC mode with 100% online and only offered to Malaysian students. They have completed 12 years of formal education and one to two years of Pre tertiary education prior to their enrolment into the degree program at Taylor's University.

TITAS and HE via MOOC at Taylor's University

The two modules, TITAS and HE fall under the category of general studies modules and are mandatory for all Malaysian students pursuing Bachelor's degree.

TITAS modules recognizes the benefits of the ancient civilization, the advantages and disadvantages of the past and present to devise future strategy while HE module focuses on the study of the basic concepts of ethics relations.

These two modules were conducted with an initial two hours of face to face briefing session in Week 1 where the lecturer concern provided a thorough explanation of the modules. Students were guided to register and use the Open Learning platform and Taylor's Moodle Platforms during this face-to-face session. Students were required to participate in online learning via MOOC platform in a weekly basis. They were responsible to complete the exercises, watched the videos and conducted self-study. The online learning via MOOC replaced the face-to-face lessons throughout the semester. The weekly activities (checkpoints) were treated as the attendance for this virtual classes. It was mandatory for students to complete 100% of attendance. Two times of YouTube Live sessions were also conducted by the lecturer in 6th and 12th week of the semester to have live discussion with the students regarding their assignments and projects. These live discussion sessions were recorded and uploaded to the MOOC platform for students to review.

Data Collection

The link to online survey questionnaire in Google form was posted on the Taylor's MOOC platform for students to response to the survey questions at the end of the semester. The online questionnaire includes 10-item of learning self-efficacy in MOOC, 6-item of MOOC-satisfaction, and 5-item of MOOC-Loyalty. It also includes another two factors which affect the self-efficacy and MOOC-satisfaction, that is: 9-item on Ease of learning in MOOC and 5-item on Quality of MOOC content. Reliability test was performed for the pilot study sample and the Cronbach's alphas for the three variables, students' Learning self-efficacy in MOOC, MOOC-satisfaction and MOOC-Loyalty for the pilot study sample are 0.979, 0.959, 0.964 respectively while Cronbach alpha for Ease of learning in MOOC and Quality of MOOC content are 0.962 and 0.964 respectively.

Data Analysis

Until the end of Nov 2019, some of the data were not complete as students from August 2019 semester were busy in preparing for their final exam but promised to return the online questionnaire by end of December. After the complete set of data collected from the online questionnaire tabulated in the google sheets, it can be converted into SPSS worksheet IBM SPSS, version 20. All the null hypotheses can then be tested using the statistical analysis.

Findings

This research is expected to use Pearson's Product Moment Correlation Coefficient to test the relationship among all the variables in the study after the complete set of data is obtained. Table 1 displays all the null hypotheses and alternative hypotheses. The results from the computation of Pearson's Product Moment Correlation Coefficient play the important role to determine if the null hypothesis is rejected in favor of alternative hypothesis or fail to reject the null hypothesis:
That is,

- if $R(952) = 0.xxx$, $p < 0.01$, Two-tailed, then reject null hypothesis in favor of alternative hypothesis,
- if $R(952) = 0.xxx$, $p > 0.01$, Two-tailed, then fail to reject null hypothesis.

Table 1: Results Of Testing Hypotheses with Pearson's Correlation Coefficient

Null Hypotheses	Pearson R and p-value	Alternative Hypotheses	Results: Reject/ Fail to reject
H_{01} : There is no statistical significant positive correlation between Quality of MOOC content and learners' Learning Self-efficacy in MOOC.		H_1: There is a statistically significant strong positive correlation between Quality of MOOC content and learners' Learning Self-efficacy in MOOC.	
H_{02} : There is no statistical significant positive correlation between Quality of MOOC content and learners' MOOC-satisfaction.		H_2: There is a statistically significant strong positive correlation between Quality of MOOC content and learners' MOOC-satisfaction.	
H_{03} : There is no statistical significant positive correlation between Ease of learning in MOOC and learners' Learning Self-efficacy in MOOC.		H_3: There is a statistically significant strong positive correlation between Ease of learning in MOOC and learners' Learning Self-efficacy in MOOC.	
H_{04} : There is no statistical significant positive correlation between Ease of learning in MOOC and learners' MOOC-satisfaction.		H_4: There is a statistically significant strong positive correlation between Ease of learning in MOOC and learners' MOOC-satisfaction.	
H_{05} : There is no statistical significant positive correlation between learners' Learning Self-efficacy in MOOC and learners' MOOC-satisfaction.		H_5: There is a statistically significant strong positive correlation between learners' Learning Self-efficacy in MOOC and learners' MOOC-satisfaction.	
H_{06} : There is no statistical significant positive correlation between learners' Learning Self-efficacy in MOOC and learners' MOOC-Loyalty.		H_6: There is a statistically significant strong positive correlation between learners' Learning Self-efficacy in MOOC and learners' MOOC- Loyalty.	
H_{07} : There is no statistical significant positive correlation between learners' MOOC-satisfaction and learners' MOOC-Loyalty.		H_1: There is a statistically significant strong positive correlation between Students' MOOC- satisfaction and students' MOOC-Loyalty.	

Discussion

A pilot study for the March 2018 semester showed a strong positive correlation between the predictor and outcome variables.

However, the researcher suspected that the learning self-efficacy has direct impact on the MOOC-loyalty. Thus, a higher order partial correlation need to perform to determine if the Learning self-efficacy is correlated with the MOOC-Loyalty not because it exerts some direct effect upon the MOOC-Loyalty, but because it causes changes in MOOC-satisfaction, and then the MOOC-satisfaction causes changes in MOOC-Loyalty. It is essential to determine if MOOC-satisfaction is an intervening variable known as mediator which mediate the relationship between Learning self-efficacy and MOOC-Loyalty.

Conclusion

The strength of association among the variables in the pilot study sample of 195 participants, namely, students' Learning self-efficacy in MOOC, MOOC-satisfaction, and MOOC-Loyalty at Taylor's University were determined using Pearson's Correlation coefficient in SPSS. Besides, the relationship between the other two factors affecting the learning self-efficacy and MOOC-satisfaction, i.e Ease of learning in MOOC and Quality of MOOC content were also determined. The results from Pearson's zero order correlation for the pilot study sample suggested that all the null hypotheses were rejected in favour of their respective alternative hypotheses. A comprehensive set of data is currently under study to verify this results.

Recommendations

To improve the rigorous and robustness of this type of study, further research can be conducted to look into several issues such as the relationship among learners' acceptance of MOOC and usability, usefulness, loyalty, satisfaction and ease of use based on Technology Acceptance Model (TAM).

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