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Towards MOOC for Technical Courses: A Blended Learning Empirical Analysis

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***Abstract*— Massive Open Online Learning (MOOC) is one of the rapidly growing and the most trending online learning platform throughout the world. As reported by Class Central up until December 2015, there are more than a total of 4200 courses, which enrolled more than 35 million students and adopted by more than 500 universities all over the world. Thus, the objective of this study is to identify the students' readiness towards MOOC technical courses based on blended learning approach. This study adapted quantitative based approach to analyse the data gathered. Descriptive analysis and factor analysis are used to empirically analyse a total of 39 items on student attitude towards blended learning. This study successfully in developing six dimensions of student attitude towards the implementation of MOOC learning. The attributes namely are attitude towards learning flexibility, online learning, study management, technology, online interaction, and classroom learning. The findings summarized that, when students had a positive attitude towards learning flexibility, online learning, study management, technology, and online interaction, the students were more likely to adapt to blended learning and highly ready towards MOOC learning. On the other hand, when students had a positive attitude towards classroom learning, they were less likely ready towards MOOC learning, as they would prefer to meet their lecturers and friends in a physical lecture class compared to on the web-based. Understanding of student's readiness towards MOOC learning based on blended learning approach is one of the critical success factors for implementing successful MOOC by higher learning institutions.**

***Keywords*—student readiness; student adaptability; MOOC; online learning; blended learning**

I. INTRODUCTION

The influence of technology innovation continues expanding and impacting all industries as it evolves including in the education field. In education, the technology roles have directly and indirectly changed the design and delivery of teaching and learning process. Devices like smartphones and tablets are starting to replace conventional classroom teaching and learning system. This change has brought a paradigm shift especially in the field of higher learnings institution. This scenario affecting the teaching practices and the ways of students acquire knowledge. Thus, in order to be in line with the current technology change, it is a must for higher learning institutions to continuously figure out latest and innovative solutions to improve the current teaching and learning process [1].

A. Massive Open Online Course (MOOC)

One of the solutions is by adapting teaching and learning process with online learning. MOOC is one of the most rapidly growing online educational based learning. Basically, the main purpose of online learning is to offer its learners with access to education materials at their own pace and time, as well as lowering the average educational learning cost [2]. MOOC is a tuition-free course taught over the internet which allows virtually anyone to attend the course [2]. As reported by Class Central up until December 2015, there are more than a total of 4200 courses being offered, which enrolled more than 35 million students and adopted by more than 500 universities all over the world and it is expected that the number to increase more than double in 2016 [3]. The courses offered cover all the fields which can be categorized into technical courses which are technical and business courses; and non-technical courses which are humanities and social science courses.

Research on the MOOC has been done largely either in the pedagogical approaches or in the learning design from the context of educational setting that explored in both technical and non-technical subjects [2], [4]-[9]. However, only a number of researches have been carried out in Malaysia to examine student's attitude towards various learning aspects that can affect student's adaptability and readiness towards MOOC based on the empirical analysis perspective [10], [11]. As reported by Tang and Chaw,

blended learning can be categorized into six broad aspects, namely: attitude towards learning flexibility (FL), attitude towards online learning (OL), attitude towards study management (SM), attitude towards technology (TE), attitude towards online interaction (OI) and attitude towards classroom learning (CL) [1]. The objective of this study is to identify the student's readiness towards the implementation of MOOC technical courses based on blended learning approach.

B. Student Attitude Towards Blended Learning

In this research, the six learning aspect of student attitude is adapted from the study done by Tang and Chaw [1]. The study identified six learning aspects to measure the student's readiness towards blended learning, which are learning flexibility, online learning, study management, technology, online interaction and classroom learning. The first learning aspect is learning flexibility. Blended learning provides location convenience and time saving to the learners. The learning process can be done anytime and anywhere at their convenience period. A student also has unlimited time to access to the learning materials through the web. The second learning aspect is online learning. Online learning aspect allows learners to reflect and express their ideas better and this suited with learners who reluctant to share their ideas in front of public [1]. Several studies also support that online learning discussion able to promote a high level of interactivity with peers, influence active collaborative learning, can increase student engagement and improve student performance [12].

The third learning feature is study management. Tang and Chaw [1] shared that study management aspect can be reflected as a self-regulated learning process in which learners make an intended effort to plan, manage and direct the learning process with the instructor. With proper study management, learners able to create high in self-discipline and can motivate themselves with the learning process. The fourth learning aspect is technology. Information technology is one of the major role plays towards successful blended learning. Technology allows the learners to engage more with the learning process at anytime and anyplace. Besides, through technology assistance, learners can build online community across borders and time zone, as well as more prevalent than traditional face-to-face communities.

The fifth learning feature is online interaction. Two-way interaction and group discussion must exist in order to engage the learners with the learning process. Thus, these elements should be incorporated into a blended learning environment. In addition, blended learning provides a seamless communication medium especially for group-based learning which allows the student to actively communicate with another student in the MOOC course. Moreover, online learning platform also can motivate and encourage learner-learner and learner-instructor interaction boundlessly. The sixth learning feature is classroom learning. The authors [1] also shared that the classroom community offers a sense of real, meaningful interaction between learners and instructors, which cannot be replaced by online learning. The stronger the student's dependence for classroom learning, the less prepared for the student to move towards fully MOOC implementations which require high self-independence. However, with the assistance of interactive e-content and e-activities offers in MOOC these problems can be addressed [13], [14]. Therefore, the early hypothesis that can be drawn is a student who possesses a positive attitude towards learning flexibility, online learning, study management, technology, and online interaction reflect a high level of readiness to adapt towards MOOC learning. In contrast, the more negative of student attitude towards classroom learning, the more prepared the student will be towards MOOC learning.

C. Student Readiness Towards MOOC

Overall, each of the learning aspects highlighted above address the major advantages offered by blended learning through online learning and MOOC. This also reflects that online learning as one of the preferred learning platform options by generation Y (gen Y) learners [3]. Gen Y is a generation who was born between the 1980 and the year 2000 and is a generation that high with visual literacy; comfortable in an image-rich environment; equipped with latest technology and gadgets, and they are online and connected 24/7, 365 days a year [15]. While online learning offers flexibility in accessing the learning materials and conducting learning process as per prefer by the learners' own pace and convenience time. Thus this platform becomes one of the preferable learning platforms among gen Y learners. Through this study, we can identify the readiness level of gen Y learners towards most highly technology online learning platform which is MOOC. As cited by [1] in their research, it is essential for IHLs generally, and higher management of each university specifically, to understand their students' attitude in order to identify the level of readiness for blended learning.

II. Material and Method

A quantitatively based method was chosen as the blueprint in this study which focuses on exploratory research. Questionnaire type is used as the main data collection method for this study. This section explains on the sample chosen, chosen survey instrument, data collection procedures and analysis methods used to analyze the gathered data.

A. Participants

A total of 909 valid respondents (n = 909), from a public technical university in Malaysia that covers seven faculties in who took part in the survey. The respondents consist of undergraduate students from engineering and computer science faculties. Both of these faculties are mirrored as the technical faculties as they involved more courses and subjects that deal with practical-based and laboratory activities. The respondents consist of new intake students into the university who going to be the first batch to experience different learning environment process. This is because there are few courses that they will enroll which the teaching and learning process being done via MOOC platform. Thus, through this study, the university can identify the level of students' readiness towards the implementation of MOOC technical courses. In this study, MOOC platform identified as one of the learning tools that being used for blended learning. Before the survey, the respondents were informed about the purpose of the survey,

how the survey being carried out and the important definitions of few terms used in the study. Among the participants, 536 (59.1%) of them were male while the rest were female. Table 1 shows the scattering number of participants based on their respective faculties.

TABLE I
THE NUMBER OF PARTICIPANTS BY FACULTY

Faculty	Frequency	Percent
FKM	69	7.6
FKEKK	97	10.6
FKP	102	11.2
FPTT	109	12
FKE	127	14
FTMK	148	16.3
FTK	258	28.3
Total	**909**	**100**

B. Survey Instrument

Questionnaire data collection methods have been widely used in collecting information on student readiness for learning research [1], [16]-[18]. The questionnaire consists of three major sections part I, part II and part III. Part I gathered information on respondent's demographic info and their understanding of blended learning and MOOC where the item is measured using a likert scale from 1 to 5 (1-Not all familiar; 2-Slightly familiar; 3-Somewhat familiar; 4-Moderately familiar; 5-Extremely familiar) options. While part II consists of 39 items to measure the student's attitude towards six learning aspects where each of the 39 items is measured using a likert scale from 1 to 5 (1-Completely Disagree; 2-Somewhat Disagree; 3-Somewhat Agree; 4-Strongly Agree; 5-Completely Agree) options. Lastly, part III collected information on technology they used. This study adopted and enhanced a student readiness model from Tang and Chaw (2013). In addition, three items were added to identify the construct readiness towards MOOC learning.

The questionnaire consists of 39 items categorized into seven learning aspect instruments namely as Learning Flexibility (FL), Online Learning (OL), Study Management (SM), Technology(TE), Online Interaction (OI), Classroom Learning (CL), and Readiness Towards MOOC (RTM). From these seven instruments, six instruments categorized as independent variables (FL, OL, SM, TE, OI, CL) and one item as dependent variable (RTM). This model proposed that, when students had a positive attitude towards learning flexibility, online learning, study management, technology, and online interaction, the students were more likely to adapt to blended learning and highly ready towards MOOC learning. On the other hand, when students had a positive attitude towards classroom learning, they were less likely ready towards MOOC learning, as they would prefer to meet their lecturers and friends in a physical lecture class compared to on the web-based. Fig. 1 depicts graphically the research model adopted in this.

C. Data Collection Procedure and Analysis

A total of 1000 questionnaire distributed manually to the participants. Only 950 questionnaires successfully returned back and a total of 909 responses were identified as valid response being analyzed. In order to identify the reliability each of the construct used, Cronbach-Alpha test was implemented.

III. RESULT AND DISCUSSION

This section presents the results of the study. Findings from the Cronbach's Alpha value for all the variables reflected as acceptable (above .70) and preferable (above .80) [19]. This reflects very good internal consistency reliability among the items for each of the construct. This mirrors that the constructs used to measure student's readiness in this study are reliable. Table 2 presents the Cronbach-Alpha value and number of items for each of the construct.

A. Demographic Analysis

In order to capture the respondents' background details on mobile devices and their understanding on blended learning and MOOC, an extra three items added to the questionnaire. When asked about the mobile devices that they used to access information, among 909 feedbacks, 86.8% own an android based phone, 15.3% own an iPhone, 11.4% have a tablet, 5.7% have an iPad, 2.6% own an eBook reader, 1.1% own iPod and remaining 2.2% of the participants that do not own any mobile devices. This reflects that majority of the respondents have technology facilities to access the learning materials anytime and anywhere.

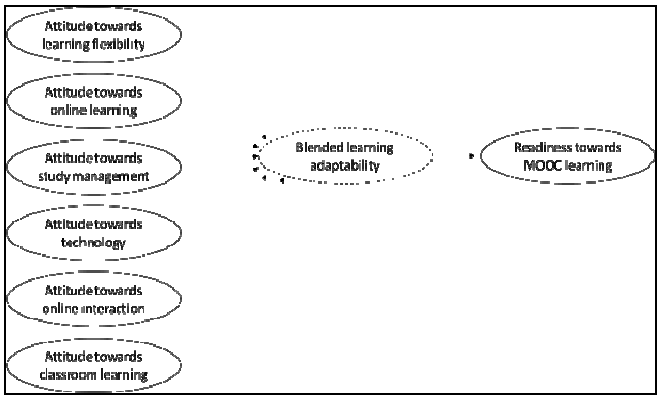

Fig. 1 Research model to measure student readiness towards MOOC learning

TABLE II
CRONBACH-ALPHA VALUE FOR EACH OF THE INSTRUMENTS

Component	Cronbach Alpha	Items
Flexible Learning	.722	4
Online Learning	.736	8
Study Management	.718	6
Technology	.806	6
Online Interaction	.767	7
Classroom Learning	.838	5
Readiness towards MOOC	.878	3

Fig. 2 presents the result on the respondents' understanding of blended learning. The results showed that 54 (6.2 %) of the respondents are not familiar, 74 (9.0 %) respondents were slightly familiar, and 371 (42.7 %) respondents were somewhat familiar. While a total of 309 (35.6 %) respondents were moderately familiar and 56

(6.5 %) respondents are extremely familiar (M = 3.27; SD = .94).

Fig. 3 below illustrates the distribution of respondents' understanding MOOC learning. The results showed that 52 (6.0 %) of the respondents are not familiar, 88 (10.1 %) respondents slightly familiar and the number of 315 (36.3 %) respondents were somewhat familiar. While a total of 325 (37.4 %) respondents were moderately familiar and 88 (10.1 %) respondents are extremely familiar with MOOC (M = 3.36; SD = 1.00).

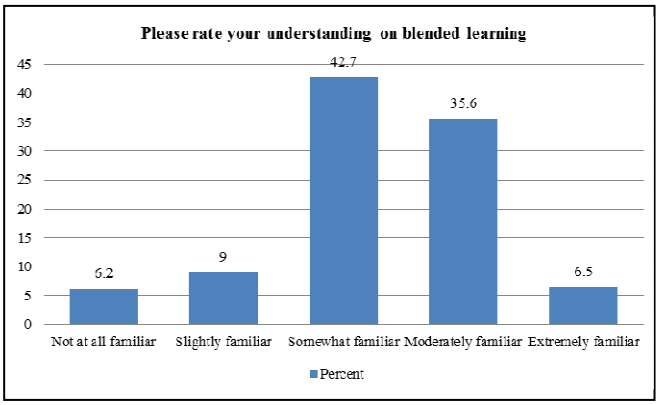

Fig. 2 Result for 'Please rate your understanding on blended learning' item

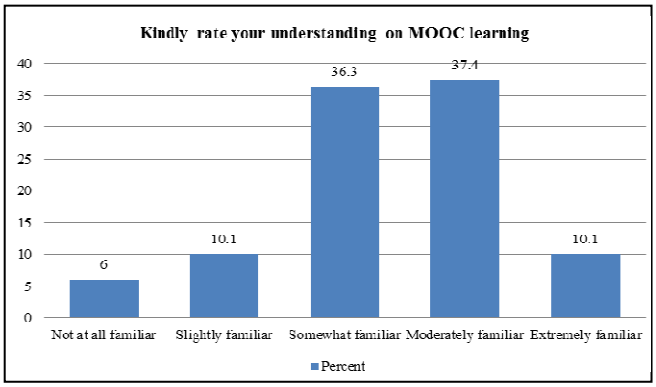

Fig. 3 Result for 'Please rate your understanding on MOOC learning' item

B. Descriptive Analysis

To further understand the data gathered, this section analyzed based on the means and standard deviation values by each construct. In the statistical results of the flexible learning category, the results clearly reflect that the learners are strongly agreed to have flexible options in terms of an access to the lecture materials, learning time management and location to conduct the learning, with total average means of 4.00. Table 3 below summarize mean and standard deviation of the items for flexible learning dimension.

TABLE III
DESCRIPTIVE RESULTS FOR FLEXIBLE LEARNING CATEGORY

	Flexible Learning	**Means**	**SD**
FL1	I would like unlimited access to lecture materials	4.20	0.87
FL2	I would like to decide where I want to study	3.98	0.89
FL3	I like to study at my own pace	3.93	0.93
FL4	I would like to decide when I want to study	3.87	1.00
	Total	4.00	0.92

In terms of online learning category, the results uncover that majority of the learners do agree that online learning allows them to engage more with the lecture because they feel more comfortable with the learning and give them more flexibility in order to express their thoughts better. Table 4 illustrate mean and standard deviation of the items for online learning dimension. Further analysing from study management perspective, the majority of the respondents do once again agree that learning via MOOC can help them to better organize and manage their learning process more effectively. Besides, they do also agree that online learning makes them more responsible for their study. Table 5 show the mean and standard deviation of the items for study management dimension.

TABLE IV
DESCRIPTIVE RESULTS FOR ONLINE LEARNING CATEGORY

	Online Learning	**Means**	**SD**
OL1	I believe face-to-face learning is more effective than online learning	3.98	0.99
OL2	I am comfortable with self-directed learning	3.65	0.94
OL3	I do not resist having my lessons online	3.49	0.92
OL4	I like online learning as it provides richer instructional content	3.51	0.95
OL5	I would like lecture time in the classroom to be reduced	3.33	1.09
OL6	I would like to have my classes online rather than in the classroom	3.05	1.11
OL7	I get bored when studying online	3.05	1.06
OL8	I find it very difficult to study online	3.08	1.05
	Total	3.39	1.01

TABLE V
DESCRIPTIVE RESULTS FOR STUDY MANAGEMENT CATEGORY

	Study Management	**Means**	**SD**
SM1	I am more likely to miss assignment due dates in an online learning environment	3.20	1.00
SM2	I organize my time better when studying online	3.18	0.88
SM3	I can study over and over again online	3.69	0.99
SM4	Online learning motivates me to prepare well for my studies	3.49	0.88
SM5	Online learning encourages me to make plans	3.52	0.88
SM6	Online learning makes me more responsible for my studies	3.43	0.91
	Total	3.42	0.92

In addition, statistical analysis from the technology dimension obtained an overall average of 3.77, with an acceptable standard deviation, as presented in Table 6. This reflects that majority of the students agree that learn through the web is easy to be used and is a very useful platform. Besides, they also agree that the used of iPad, tablet, smartphone, wearable technology and MOOC are another alternative in making the learning more fun and engaging.

TABLE VI
DESCRIPTIVE RESULTS FOR TECHNOLOGY CATEGORY

	Technology	Means	SD
T1	I believe the Web is a useful platform for learning	3.95	0.89
T2	I am familiar with Web technologies	3.53	0.92
T3	I find Web technologies easy to use	3.66	0.87
T4	I think we should implement wearable technologies in learning	3.75	0.85
T5	I think we should implement iPad/ tablets/ smart phones in learning	3.86	0.92
T6	I think we should use MOOC platform as one of the alternatives in learning	3.85	0.84
	Total	3.77	0.88

Likewise, the online interaction category obtained an overall mean of 3.56, with an acceptable standard deviation. The majority of the learners do agree that they feel more comfortable and easy to communicate, discuss and share their opinions via online. This reflects that via online learning it can increase the students' motivation and confidence level to express their ideas boundless. Table 7 show the mean and standard deviation of the items for online interaction dimension. On the other hand, the classroom learning criteria obtained an overall mean of 3.56, with an acceptable standard deviation, as presented in Table 8. Particularly, CL2, CL3, and CL5 obtained high mean scores of 4.12, 4.0, and 4.21 respectively. These indicators highlight that although the students agree with the advantages offer by online learning as per discussed earlier, but they still possess strong dependence for classroom-based learning. This reflects that the students less prepared to move on with fully MOOC learning. However, as we mentioned earlier, with the assistance of interactivity of e-contents and e-activities, online forums and chats rooms between learner-learner and learner-instructor offers by MOOCs platform, the issue of classroom dependency can be reduced.

TABLE VII
DESCRIPTIVE RESULTS FOR ONLINE INTERACTION CATEGORY

	Online Interaction	Means	SD
OI1	I feel isolated in an online learning environment	3.27	0.92
OI2	I am comfortable in using Web technologies to exchange knowledge with others	3.61	0.82
OI3	I would like to interact with my lecturer online	3.45	0.92
OI4	I would like to interact with other students outside of the classroom	3.80	0.84
OI5	I find it easy to communicate with others online	3.60	0.93
OI6	I appreciate easy online access to my lecturer	3.69	0.89
OI7	I can collaborate well with a virtual team in doing assignments	3.53	0.92
	Total	3.56	0.89

TABLE VIII
DESCRIPTIVE RESULTS FOR CLASSROOM LEARNING CATEGORY

	Flexible Learning	Means	SD
CL1	I have a sense of community when I meet other students in the classroom	3.86	0.90
CL2	I like the fast feedback when I meet my lecturer in person	4.12	0.81
CL3	I find learning through collaboration with others face-to-face is more effective	4.00	0.82
CL4	I learn better through lecturer-directed classroom-based activities	3.91	0.83
CL5	I learn better when someone guides me personally	4.21	0.83
	Total	4.02	0.84

C. *Exploratory Factor Analysis*

Statistical analysis based on factor analysis was used to further explore the data gathered. EFA is one of the analysis methods that can be used to identify the number of dimensions for a construct [1]. In EFA the number of factors is not specified before the analysis. The analysis attempts to examine individual items across factors, identifying items that load strongly on a particular factor [1]. Items that load strongly on one factor but not on others are grouped together to form a scale. Any item that cross-loads on more than one factor or loads weakly on any factor is considered for deletion. The most common extraction method is principal components analysis (PCA) [1]. An EFA is necessary to examine the dimensionality of the scale before a confirmatory factor analysis (CFA).

We first performed an item analysis on 36 items (excluding three items from Readiness towards MOOC construct) to eliminate any item that had an inter-item correlation below 0.3 [1] and an item-total correlation below 0.3 [1]. As a result, a total of ten items were deleted. Two items were removed from the attitude towards online learning construct (OL1: "I believe face-to-face learning is more effective than online learning" and OL8: "I find it very difficult to study online") and one item was removed from attitude towards learning flexibility (FL1: "I would like unlimited access to lecture materials"). The remaining of seven items were then deleted from construct attitude towards online interaction because of the presence of multicollinearity, where the total tolerance value for the whole construct is less than .10 (0.049) and the VIF value is more than 10 (20.955).

We then further conducted a Principle Component Analysis (PCA) on the remaining 26 items. Assuming that there were correlations among the items, the Direct Oblimin rotation method was used. The Kaiser-Meyer-Oklin (KMO) value was 0.867, exceeding the recommended value of .60 [19] and Bartlett's test reach statistical significance ($p = 0.000$), supporting the factorability of the correlation matrix and provided evidence that the dataset was appropriate to perform factor analysis. From the communality value, using PCA extraction method, we only interested with the extraction value more than 0.30 [19]. Low extraction values (below .30) indicate that the item does not fit well with the other items in its components [14], resulted in one item (SM1:" I am more likely to miss an assignment due dates in an online learning environment") deleted. The reason to remove the item with low communality values is to increase the total variance explained.

As explain earlier, there are several analysis methods that can be used to determine the number of factors to retain such as Kaiser's criterion, scree test, and parallel analysis. However, in this research, we adopted only Kaiser's criterion and parallel analysis techniques as factor analysis. Next, based on the result drawn from Kaiser's criterion, we only interested with the constructs that have an eigenvalue more than 1. Here, there are only five factors (7.396, 2.982, 1.877, 1.566, 1.343) has been suggested for PCA to be retained. These five components explain a total of 57.13 percent of the variance, indicating that the five learning factor instruments able to reflect as much 57.13 per cent of the students' readiness towards blended learning.

After that, we further conducted a parallel analysis to cross check the number of factors as per suggested by other research [1]. The parallel analysis suggested five factors. Items that loaded below .50 on any of the factors or cross-loaded above .50 must be deleted in order to produce better result analysis [1]. As the result, five item were deleted (SM2: "I organize my time better when studying online", OL2: "I am comfortable with self-directed learning", TE1: "I believe the Web is a useful platform for learning", TE5: "I think we should implement iPad/ tablets/ smartphones in learning", TE6: "I think we should use MOOC platform as one of the alternative in learning").

After completed item analysis and PCA analysis, we had a total of 20 items were remain with five factors explained 61.23 percent of the total variance, indicating that based on these five learning factor instruments able to reflect the students' readiness towards blended learning. Table 9 summarized the exploratory factor item loading for PCA with Obimin rotation of five-factor solution on 20 items.

Factor analysis also can be used to identify the critical factors in the overall research items [19]. Based on factor analysis, it can be found that study management is the most dominant factors that contributed 25.89 per cent from 61.23 per cent of the total variance with eigenvalues of 5.179. This factor consists of four items. The second factor is classroom learning. Eigenvalues are 2.775 with a variance contribution is 13.88 per cent. This factor contains five items. The third factor is flipped learning with three items that contribute 8.33 percent of the total variance with eigenvalue 1.666. The fourth factor is online learning. Eigenvalues are 1.353 with a variance contribution is 6.77 per cent. This factor contains five items. The fifth factor is a technology with four items that contribute 6.23 per cent of the total variance with eigenvalue 1.273.

TABLE IX
EXPLORATORY FACTOR ITEM LOADING BASED ON 20 ITEMS

ITEMS	FACTOR				
	1	*2*	*3*	*4*	*5*
SM4	.906				
SM5	.832				
SM6	.806				
SM3	.571				
CL3		.846			
CL4		.820			
CL2		.758			
CL5		.706			
CL1		.647			
FL4			.823		
FL3			.803		
FL2			.742		
OL5				-.771	
OL6				-.743	
OL7				-.731	
OL3				-.716	
OL4				-.574	
TE2					-.896
TE3					-.861
TE4					-.603
Total Variance Explained	5.179	2.775	1.666	1.353	1.273
Percentage Variance Explained	25.89	13.88	8.33	6.77	6.360

IV. CONCLUSIONS

Understanding of students' attitude towards blended learning based on different learning aspects is one of the critical success factors for implementing successful MOOC by higher learning institutions. The assessment results reveal a positive feedback on students' adaptability and readiness towards successful blended learning and MOOC implementation. In this study, it shows that students who have a positive attitude towards learning flexibility, positive attitude towards online learning, positive feedback on study management, positive feedback towards technology, and positive attitude towards online interaction reflect a high level of readiness to adapt to MOOC learning. On the other hand, the findings also summarize that when students had a positive attitude towards classroom learning, they were less likely ready towards MOOC learning, as they would prefer to meet their lecturers and friends in a physical lecture class compared to on the web-based. The findings indicate that there is no reason to reject the hypothesis. These findings also being supported by some other studies in the same research area [1], [17]-[20]. The implementation of MOOC through blended learning able to prepare the students towards full implementation of MOOC platform for technical courses offered by universities. In MOOC environment, every individual student must possess strong self-determination spirit in order to fully engage with the learning process. This study also supports that self-determination able to motivate a learner towards online course completion [2].

On the other hand, the result revealed the positive relationship between attitudes towards classroom learning and readiness towards MOOC learning. As discussed earlier, the stronger the student's dependence for classroom learning, the less prepare for the student towards MOOC learning which requires high self-independence. However, with the assistance of interactive e-content and e-activities, such as lecture videos, tutorials videos, weekly quizzes, online games, online group discussion, forums and many other interactive activities offers in MOOC, high dependability on face-to-face lecture can be address [2], [4], [9]. Besides, the e-contents and e-activities provided via

MOOC able to foster active learning, able to create a meaningful connection with the learning process, allow lecturers to frequent monitoring of learning process, and can support active interaction among student with student and student with lecturer [2].

Overall, the result of this study offers some implications in the learning environment. Firstly, by identifying the students' readiness for blended learning it provides an information to the university's top management on their students' adaptability and readiness for the future implementation of MOOC courses. As the output, educators can prepare suitable teaching and learning counter plans in order to support the students towards fully online learning. Secondly, this study also proved and shared six learning aspects to measure student's readiness towards MOOC, which is one of the online learning platform used as blended learning aids. This empirical analysis also can be used by other educators to measure their students' adaptability and readiness towards blended learning.

There are still a lot more works to do in this study. The researcher will further conduct a triangulation process in order to confirm findings from this study. In addition, acceptance analysis towards MOOC implementation and the effects of MOOC in enhancing learning experience among students will be other interesting aspects which can be explored further.

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