Digital Learning Platform and Students Satisfaction: Regression Analysis

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Abstract — Technology has no boundary, people made technology as their primary routine in daily task. Technology also mainly being used worldwide and provide many outcomes towards the education system. The transformation of industrial revolution 4.0 brings the education system one step forward to meet the worldwide demand. Students nowadays are Z-generation that live in modern and digital lifestyle. Thus, the digital platform such as E-Learning has been applied in recent of teaching and learning in most of the university. However, the application and usage of e-learning in university did not well used and applied by students. Hence, there is a need for e-learning platform to transform and improve the system so that student can be more interest to use E-learning and ultimately result in better academic performance. A theory of Technology Acceptance Model (TAM) applied as the fundamental of this study. Hence this study aims to investigate the perception of 152 students in selected of the local university towards the application of e-learning platform. Data collection further analysed using regression analysis and found perceive usefulness, perceived ease of use, behavioural intention and system usage predict significantly towards student satisfaction. The finding implies that the application of e-learning among students was satisfied. The improvement of the interaction system and attraction of the system can promote and encourage students active to use e-learning.

I. Introduction

In a new era of industrial revolution 4.0 (IR 4.0), technology has become a priority not only to governance, industry and society but technology also is important to higher learning education in Malaysia. Malaysia recently outlined 10 shifts need to change Higher Learning Education (HLE) to meet the demand and challenge of Education 4.0. Nowadays, Education 4.0 crucial to change employment trend into a digital revolution. Thus, HLE needs consistently to anticipate and prepare changing skill and new knowledge and new demand which unpredict unforeseen problem and issue in future. Therefore, Malaysia highlight Globalize online learning and transformation Learning and Teaching in Higher Education delivery to provide student diversification of roles as an expert in knowledge, content, procedure, and connection markers. This included self-determined learning, peer-oriented learning, virtual based learning and experiential learning with advocate learning without lectures and learning outside class. An advanced technology incorporates with Internet change the platform to e-learning delivery of knowledge at anywhere and anytime beyond a physical space. For an instant, adopting new e-learning technologies such as instant messaging, video conferencing, chat rooms, email, and file sharing for student group assignment enables work to be completed remotely. Furthermore, students can communicate with instructors and schoolmates via video conferencing (Al-Ammari & Hamad, 2008). Ideally, the development of

e-learning is seen as a potential method to changed learning method from traditional learning systems. However, recent research on the acceptance and use has shown negative results related to the high percentage of students from starting courses who are upheld by these instruments and did not end their course project, although the advantages gave by this technology (Ramirez, Sabate, & Viejo, 2015).   On a further note, the student did not complete their study with excellent results although after the development of e-learning. The reason for this issue could be due to no exploration on the joint commitments of e-students' socio-statistic, hours spent on the web disconnected. More than that, the requirement for a far-reaching approach, considering every one of the encounters e-students (Kumar, Gankotiya, Dutta, 2001). Thus, this study attempts to predict the basis of technology acceptance and student satisfaction of e-learning practices in university.

II. Fundamental of Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) (Davis, 1989) is the most frequently cited and influential model for measures and predicts the acceptance and usage level of technology. TAM has received extensive empirical support in the IS implementation particularly in area e-learning (Liu, Chen, Sun, Wible, & Kuo, 2010; Rodriguez & Lozano, 2011; Sánchez & Hueros, 2010). In the TAM, there are two direct determinants of behavioural intention which are perceived ease of use (PEOU) is defined as "*the degree to which a person believes that using a particular system would be free of effort"* (Davis, Bagozzi, & Warshaw, 1989 p. 320), while perceived usefulness (PU) is defined as *"the degree to which a person believes that using a particular system would enhance his/her job performance"* (Davis, 1989, p. 453). Numerous studied commonly used TAM and the finding supported and confirmed the causal relationship between PU and PEOU on BI particularly in the context of e-learning studies (Liu, Chen, Sun, Wible, & Kuo, 2010). However, there have been some criticisms of the existing parameters of the TAM neglected the investigation of other essential predictors and factors that may affect the adoption and acceptance of technology to fully explain technology adoption and usage (Bagozzi, 2007). Therefore, this study extends the TAM to include two other determinants, namely, behavioural intention and system usage, to investigate the extent to which these variables affect students' willingness to adopt and use e-learning systems in universities. This article adds to the few studies that have taken into account the critical role that social and individual factors play in e-learning technology acceptance (Tarhini, Hone, & Liu, 2013c).

III. Students' Satisfaction towards E-Learning

Small, Dowell and Simmons (2012) found that many of the tools that facilitate the student-to-student interaction were the least important, least satisfying and rated lowest in terms of meeting student expectations. This is consistent with previous research findings that show student-to-student interaction may be unimportant (May 1993) and lead to dissatisfaction (Bray, Aoki, and Dlugosh, 2008), but it is inconsistent with another, as suggested that peer interaction does lead to satisfaction (Eom., Wen, and Ashill., 2006; La Pointe and Gunawardena, 2004) and positive learning outcomes (Arbaugh and Rau, 2007). The tool that the students did find satisfying and important in terms of peer interaction was the forum – an open meeting space where messages could be posted and discussed. Small et al., (2012) suggest that the majority of students are satisfied with the virtual learning environment as a whole and more importantly students are satisfied with the tools that they identified as being important. This implies that while there is room for innovation the virtual learning environments can meet student expectations and satisfy their educational needs.

Zhang and Goel (2011) argued a positive attitude towards technology is an important variable leading to student satisfaction with a learning environment. In contemporary contexts, where interaction using online spaces is common, satisfaction is affected by more than just teaching styles. Eom., et al., (2006) argue that factors such as self-motivation, peer interaction, course structure, instructor feedback and facilitation all affect student satisfaction, but may not necessarily lead to learning outcomes. Contrary, McGill and Hobbs (2008) suggest that fitting the task to the technology contributes to overall student satisfaction. In the following study, McGill and Klobas (2009) argue that teachers also need to consider their attitude towards the online tools, the construction and value of social norms in the online environment, as well as how they use technology to facilitate the learning process. These considerations should improve teachers' use of online environments and can increase the satisfaction level that students experience. Small et al., (2012) summarized that satisfaction in education is driven by a combination of the students' capacity and goals, the teaching (quality and style) and a positive attitude towards technology that is being used to facilitate the education process.

Therefore, the hypothesis of this studied as follows:

H1: Perceived use will have a positive influence on students' behavioural intention to use the E-learning system.
H2: Perceived ease of use will have a positive influence on students' behavioural intention to use the E-learning system.
H3: System usage will have a positive influence on students' behavioural intention to use the E-learning system.
H4: Behavioural Intention will have a positive influence on students' satisfaction to use the E-learning system.

IV. Methodology

The data used to test perceive usefulness, perceive ease of use, behavioural intention and system usage towards students' satisfaction were collected from students who use E-Learning in their education at the university. This research applied the nonprobability sampling technique by convenience sampling to collect the data. The empirical data were collected from respondents by means of a self-administrated questionnaire containing 19 questions. The respondents were asked to circle their response on each question that best escribed their level of agreement with the statements. Out of the 200 distributed surveys, a 75 per cent response rate was achieved (150 participants). Of the 150 participants, the gender split was 29 (19.1%) male and 123 (80.9 %) female. Their age range varied from 18 to 22 years old was 96 (63.2%), and 56 (36.8%) was 23 to 27 years old. Majority of the participants were undergraduate students. In terms of their network usage experience, the majority of the participants (150 participants) were experienced in having internet line connection that facilitates them to use I-Learn as e-learning platform.

TABLE 1: ITEMS MEASUREMENT

Variables	Items
Perceived Usefulness (PU)	I learn faster with ILearnV3
	I improve my learning performance with ILearnV3
	I learn much easier with the use of ILearnV3
	It is useful for general learning, the use of ILearnV3
	It is not necessary to learn how to use ILearnV3
Perceived Ease of Use (PEOU)	It is difficult for me to operate ILearnV3
	My interaction with ILearnV3 is clear and understandable
	ILearnV3 is flexible to interact with
	It would be easy to have skills in the use of ILearnV3
Behavioural Intention (BI)	I will continue using ILearnV3 for the continuous semester
	I will use ILearnV3 in all my courses
	It is not important to use ILearnV3
System Usage (SU)	I tend to use ILearnV3 frequently
	I rarely explore ILearnV3
	I get involved a lot with ILearnV3
Student Satisfaction	I am not pleased to use ILearnV3 as a learning tool
	ILearnV3 is effective for gathering knowledge
	ILearnV3 is efficient to obtain learning material
	I am satisfied using ILearnV3

V. Findings and Discussion

Multicollinearity Analysis

In this study, the first assessment is multicollinearity analysis to confirm the independent variables are not highly correlated or the variables is not a combination of other independent variables. To assess multicollinearity, the bivariate analysis showed the correlation between independent and dependent variables were not more than 0.7 and above. In this study, Table 2 depicted the correlation with student satisfaction substantially is 0.485 − 0.583 respectively. Therefore, this study does not have an issue on multicollinearity. Additionally, the collinearity diagnostics further to confirm the issue on multicollinearity by asses the Tolerance

and variance inflation factors (VIF) values. According to Pallant (2016), Tolerance is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model and the formula to calculate is 1–R squared for each variable. The threshold of tolerance values must be less than 0.1. Whilst VIF is assessed by 1 divided by tolerance and the values must be greater than 10. Therefore, this study does not have an issue on multicollinearity. Table 3 showed the tolerance and VIF values are greater than 0.10 and less than 10 concluded the result does not have an issue on high collinearity.

TABLE 2: BIVARIATE CORRELATE

Variables	SL	PU	PEOU	BI	SU
Perceive Use (PU)	0.583				
Perceive Ease of Use (PEOU)	0.575	0.696			
Behavioural Intention (BI)	0.485	0.615	0.530		
System Use (SU)	0.538	0.560	0.483	0.648	1.00

TABLE 3. MULTI-COLLINEARITY ANALYSIS

Variables	Tolerance	VIF
Perceive Use (PU)	0.417	2.400
Perceive Ease of Use (PEOU)	0.495	2.020
Behavioural Intention (BI)	0.480	2.081
System Use (SU)	0.535	1.870

Assessing on Outliers, normality, homoscedasticity

Outliers are referring to very high or very low scores of the data. In regression, there is a need to delete the outliers so that the result will be in linear regression. An outlier can be deleted from the data set or score that is high from scatterplot or Mahalanobis distance that are produced by multiple regression analysis. Prior, there need to identify the critical chi-square value using the numbers of independent variables as the degrees of freedom. In this study. Table 4 showed there were four independent variable equal to 18.467 (sig=0.001). The actual Mahalanobis for this study is 33.22, however after delete 2 cases consider as outliers (114 and 4) the Mahalanobis value decrease to 18.450. Furthermore, is to check the normal distribution of residual about the data. In regression, normality can be assessed by produce Normal Probability Plot (P-P) of the Regression Standardised Residual as depicted in Figure 1. The figure explained all scores were a straight diagonal line from bottom left to top right and confirm there was no major deviation from normality.

TABLE 4: OUTLIERS ASSESSMENT

No of independent	Critical Chi-Square Value	Mahalanobis Values	Cases Deleted	After Deleted Cases
4	18.467	33.22	2 (114, 4)	18.450

Normal P-P Plot of Regression Standardized Residual

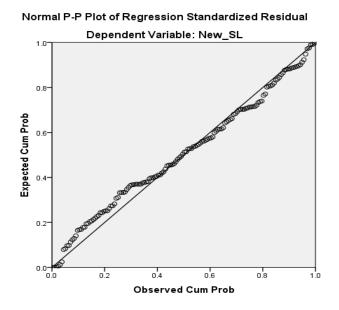**Dependent Variable: New_SL**

FIGURE 1: NORMAL P-P PLOT OF REGRESSION STANDARDIZED RESIDUAL

Regression Analysis

The R square (R^2) explains how much of the variance is the dependent variables is explained by the independent variables. In this study 0.445 or 44.5 per cent of the variance in the student, satisfaction is explained by perceive use, perceive ease of use, behavioural intention and system use. The beta value of the standardized coefficient of perceived ease of use (0.111) is the largest than perceive use (0.108), system use (0.102) and behavioural intention (0.087). This means that perceive ease of use makes the strongest unique contribution to explain student satisfaction. However, perceive use (sig <0.05 = 0.019), perceive ease of use (sig <0.05 = 0.02) and system use (sig <0.05 = 0.03) were statistically significant contribution to student satisfaction. While behavioural intention (sig >0.05 = 0.0.712) was not making a significant contribution to the prediction of this study. Therefore, hypotheses 1, 2 and 4 of this studied were supported. Consistent with previous research findings (Park, Nam & Cha, 2012; Tarhini, Hone, & Liu, 2013a), these results indicate that perceived ease of use, perceived usefulness, were all significant determinants of behavioural intention to use e-learning, with PU having the strongest relationship with behavioural intention. It is therefore believed that students who found the system useful in their learning process and also found the system easy to use were more likely to adopt the system

TABLE 5: REGRESSION ANALYSIS

Variables	R^2	Beta	Sig <0.05	Result
Perceive Use (PU)		0.108	0.019	H1: Supported
Perceive Ease of Use (PEOU)	0.445	0.111	0.020	H2: Supported
Behavioural Intention (BI)		0.087	0.712	H3: Not Supported
System Use (SU)		0.102	0.003	H4: Supported

VI. Conclusion

As a conclusion, this study aimed to predict the basis of technology acceptance and student satisfaction of e-learning practices in university using regression analysis. The technology acceptance measured by perceive use, perceive ease of use, behavioural intention and system use which adapted from the fundamental of Technology Acceptance Model (TAM). The result revealed that only behavioural intention was not supported in this studied. Whilst, perceive use, perceive ease of use and behavioural intention statistically significant towards student satisfaction. The implications of this study imply to the teaching and learning of lecturer as using technology platform. As a lecturer, the material and assessment have to be more attractive, creative and innovative that able to reflect student's understanding, complete assignment and follow all the interaction and

discussion in the platform. This would attract student interest and attention of the student to learn via a digital learning platform. More than that, the finding also reflects student's perspective whereby student able to gain knowledge and experience from a new method of learning. This allows them to be more self-independence, enhance critical thinking and have open to discussing with the lecturer and peer. The student has to take this an opportunity to learn an effective and efficient method in order to enhance their academic performance. The student has to expose themselves to the world and up to date with new technology. Therefore, the new era has brought new transformation and changes that benefit not only to an individual as a student but to a higher learning institution as well to prepare more knowledgeable students in future.

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