The Effects of Students' Characteristics on Engagement in a Learning Management System Environment

Muhammad Fadhli Abdul Rahman*
Universiti Teknologi MARA, Malaysia

Irfan Naufal Umar
Universiti Sains Malaysia

Zaridah Abdullah
Universiti Teknologi MARA, Malaysia

*Corresponding email: fadhli@salam.uitm.edu.my

Abstract

The objective of this study is to investigate the level of students' characteristics which are Internet Self-efficacy (ISE) and Self-Regulated Learning (SRL) on student's engagement towards the Learning Management System (LMS) environment. The findings of this study will help universities to have more understanding towards LMS as well as student's characteristics and student's engagement to ensure that the implementation of LMS in the universities is a success. In this study, a survey design method was applied using a set of questionnaires as a tool to examine the effects of students' characteristics (ISE and SRL) on engagement in LMS environment. Descriptive and inferential statistical approaches were used to analyze the data. This study involved 101 first-year students from the School of Educational Studies (SOE) Universiti Sains Malaysia. The result revealed that the students have a high level of ISE and SRL with means score of 3.74 and 4.05 respectively. Apart from that, students' ISE and SRL were found to be significant predictors towards student's engagement in the LMS environment.

Keywords: LMS (Learning Management System), Internet Self Efficacy (ISE), Self-Regulated Learning (SRL), Engagement, e-Learning

Kajian Mengenai Kesan Ciri-Ciri Pelajar Terhadap Penglibatan Dalam Persekitaran Sistem Pengurusan Pembelajaran

Abstrak

Objektif kajian ini adalah untuk mengkaji kesan ciri-ciri pelajar melalui Efikasi Kendiri Internet (ISE) dan Pembelajaran Terarah Kendiri (SRL) terhadap penglibatan pelajar dalam persekitaran Sistem Pengurusan Pembelajaran (LMS). Hasil kajian ini akan membantu pihak universiti untuk lebih memahami LMS dan kesan ciri-ciri pelajar (ISE dan SRL) terhadap penglibatan pelajar. Hal ini demikian kerana ianya penting untuk memastikan bahawa pelaksanaan LMS di universiti boleh berlangsung dengan jayanya. Di samping itu, pembangun sistem LMS juga boleh memanfaatkan dapatan kajian ini untuk memastikan bahawa mereka membangunkan sistem LMS yang sesuai dengan pengguna LMS atau pelajar itu sendiri. Dalam kajian ini, kaedah tinjauan telah digunakan dengan pengedaran instrumen soal selidik bagi mengkaji kesan ciri-ciri pelajar terhadap penglibatan, kepuasan dan penerimaan dalam persekitaran LMS. Pendekatan analisis statistik deskriptif dan inferensi telah digunakan untuk menganalisis data. Kajian ini telah melibatkan seramai 101 orang pelajar tahun pertama dari Pusat Pengajian Ilmu Pendidikan (PPIP) di Universiti Sains Malaysia, Pulau Pinang. Keputusan kajian mendapati bahawa pelajar mempunyai tahap ISE dan SRL yang tinggi dengan masing-masing mendapat skor min sebanyak 3.74 dan 4.05. Selain itu, ciri-ciri pelajar (daripada analisis ISE dan SRL) didapati adalah peramal yang signifikan terhadap penglibatan pelajar dalam konteks penggunaan LMS.

Kata Kunci: *LMS (Sistem Pengurusan Pembelajaran), Efikasi Kendiri Internet (ISE), Pembelajaran Terarah Kendiri (SRL), Penglibatan, e-Pembelajaran.*

Introduction

The development of Information and Communication Technology (ICT) in the late 1990s has transformed the education sectors globally. From the adoption of computers to the Internet based learning, it leads to the new approach to teaching and learning which was called as the e-learning. Partheeban and SankarRam (2014) have referred e-learning as the learning activities in which students and instructor are separated by time and place with the used of online technology such as blogs, wikis, collaborative software, computer-aided assessment, virtual classroom and Learning Management System (LMS). The implementation of LMS in Universiti Pendidikan Sultan Idris (UPSI) for example has brought many benefits to the university such as, easier to track student progress, save time and flexible learning is permitted (Rais, Karim & Hashim, 2004). Moreover, the successful implementation of LMS depends on learner engagement and interaction which resulted from the increase in learning outcome (Asmuni *et al.,* 2014).

However, none of these studies measure students' characteristics factor and their relationship with engagement in LMS environments such as Internet Self-efficacy (ISE) and Self-Regulated Learning (SRL). ISE is the belief in one capability to organize and execute courses using the Internet to create given attainments and capability of a person to use the Internet as a tool to achieve certain goals for learning (Hsu & Chiu, 2004). While, SRL is to realize of students learning motivation, belief, and knowledge on cognitive processing elements that can create work on knowledge. Hence, students will receive feedback from their peers and lecturers that can eventually enhance their knowledge and learning capabilities. The term student engagement refers to the degree of attention, curiosity, interest, optimism, and passion when the students participate in LMS environment. Student satisfaction is a fulfillment of wishes and expectation, need or pleasure derived from doing or using LMS.

Research Questions

The research questions in this study are:

1. What is the level of student's Internet Self-Efficacy (ISE) in LMS environment?
2. What is the level of student's Self-Regulated Learning (SRL) in LMS environment?
3. Do student's ISE and SRL are good predictors of their engagement in LMS environment?

Research objectives

The main objectives of this study are:

1. To identify student's level of Internet Self-Efficacy (ISE) in LMS environment.
2. To identify student's level of Self-Regulated Learning (SRL) in LMS environment.
3. To identify whether student's ISE and SRL are good predictors of student's engagement in LMS environment.

Research Methodology

The quantitative research approach is applied by using a questionnaire set as a tool to examine the effect of student's characteristics (ISE and SRL) on engagement in an LMS environment via descriptive and inferential statistical approaches. First, descriptive statistics were used to measure the level of students' characteristics (ISE and SRL) in the LMS environment. Second, an inferential analysis was performed to measure the factors affecting student's engagement in the LMS environment.

Population and Sampling

The populations of this study were including all first-year students at the School of Educational Studies (SOE), Universiti Sains Malaysia. The SOE comprises of four different majors, Bachelor of Art with Education;

Bachelor of Science with Education; Bachelor of Education (TESOL) and Bachelor of Education (Special Education). Green (1991) stated that sample size can be estimated using the rule of thumb formula n > 50 + 8m where m represents the number of predictors. In this study, there are two predictors for student characteristics (ISE and SRL). Based on the formula n > 50 + 8(2) = 66, the researcher has calculated the required number of respondents needed for this study is at least 66 respondents.

Research Variable

This study will apply two types of variables, the independent variable (IV) and the dependent variable (DV).

Independent Variable (IV)

Independent variable (IV) in this study refers to the variable that can be manipulated and predicted to influence the dependent variable (DV) or expected outcome. Independent variable in this study is the student characteristics which involving two factors (*Internet self-efficacy* and *self-regulated learning*).

Table 1: Summaries of independent variable

Independent variable	
Student characteristics actors	**Meaning of each factor**
Internet self-efficacy	The capability of a person to use the Internet tools to achieve a goal
Self-regulated learning	*Students realize their own learning motivation*

Dependent Variable (DV)

DThe dependent variable in this study is the outcome of the research. This study has only one dependent variable, namely student engagement. This study will measure student's ISE and SRL on students' engagement in the LMS environment.

Table 2: Summary of dependent variable

Dependent variable	
Variable	**Meaning of each factor**
Engagement	Degree of attention, curiosity, interest and passion in the LMS environment

Findings and Discussion

The participants were asked to rate their characteristics level in the questionnaire using five points Likert scale of: 5 = SA (Strongly Agree), 4 = A (Agree), 3 = N (Not Sure), 2 = DA (Disagree), 1 = SD (Strongly disagree). Descriptive statistics were utilized to analyze the result and the means and standard deviations were calculated to find the response level.

The level of student's characteristics (ISE and SRL) was concluded using the following measure which was adapted from Landell (1997).

Table 3: Level of student's characteristics measurement

Interval width = maximum point - minimum point/ number of levels.
Interval width=(5-1)/3=1.33
- Low level of characteristics = between 1 to 2.33
- Moderate level of characteristics = between 2.34 to 3.67
- High level of characteristics = between 3.68 to 5

Based on this measurement in Table 3, mean score between 1 to 2.33 will indicate the low level, while 2.34-3.67 will indicate moderate level and 3.68-5 will indicate the high level of ISE and SRL.

Level of Internet self-efficacy (ISE) factor

The findings for the ISE factor are shown in table 4.

Table 4: Level of Internet self-efficacy (ISE) factor

	Internet Self-efficacy	Mean	Level
1.	I feel confident browsing the Word Wide Web (WWW)	4.18	High
2.	I feel confident finding information on the World Wide Web (WWW)	4.04	High
3.	I feel confident downloading materials from the World Wide Web (WWW)	3.73	High
4.	I feel confident sharing my materials to the World Wide Web (WWW)	2.64	Moderate

Based on the table, it was found the participants' level of confidence in browsing the web is the highest (M: 4.18), followed by their level of confidence in findings information in the web (M: 4.04). However, the least level was formed to be in their confidence of sharing their material on the web (M: 2.64).

Total level of Internet self-efficacy (ISE) in an LMS environment

Table 5: Level of Internet self-efficacy (ISE) in an LMS environment

Students characteristics	Mean	Standard Deviation	Level
ISE in LMS environment	3.74	0.864	High

Since all the items that measure ISE show high means value (refer to table 5), therefore, the overall mean of ISE in an LMS environment is also high. The standard deviation is 0.864.

Self-regulated learning factor

The findings for the SRL factor are shown in table 6.

Table 6: Self-regulated learning factor

	Self-regulated learning	Mean	Level
1.	I have strategies to achieve my goals	4.22	High
2.	I feel motivated to learn	3.87	High
3.	I feel feedback from the lecturers are important to improve my work	4.27	High
4.	I work well with other students	3.86	High

Based on table 6, participants have the high level of all items mentioned above. The highest score is when the participants' felt that the feedback from the lecturers is important to improve their work (M: 4.27). It was followed by their claim that they have strategies to achieve their goal (M: 4.22). Although the students admitted that they feel motivated to learn (M: 3.87) and work well with other student's (M: 3.86), these two claims are the least important SRL factors.

Total level of SRL in an LMS environment engagement

Table 7: Self-regulated learning (SRL) in an LMS environment engagement

Students characteristics	Mean	Standard Deviation	Level
ISE in LMS environment	4.05	0.433	High

The mean for student's characteristics in an LMS environment is high (refer to table 7) because all the items' mean values are high. The standard deviation is 0.433.

Multiple regressions between student's characteristics (ISE and SRL) on LMS engagement

The results are shown in table 8, table 9 and table 10. The analysis was based on research question three: *Do students' ISE and SRL are good predictors of their engagement in LMS environment?*

Table 8: Model summary adjusted R Square between student characteristics factors and engagement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.324[a]	.105	.096	.47060
2	.383[b]	.146	.129	.46187

a. Predictors: (Constant), self-regulated learning

b. Predictors: (Constant), self-regulated learning, Internet self-efficacy

Table 8 shows the R value, R Square value, adjusted R Square value, and Std. Error of the Estimates for each of the three models. The R2= 0.146 shows that 14.6% changes in criterion variable or dependent variable *(engagement)* can be explained by the predictor variables which are the ISE and SRL. Based on this result, thus ISE and SRL are the significant factors that contribute to student's engagement in the LMS environment. However, 14.6% indicated a weak predictor of engagement.

Table 9: ANOVA[a] results between student characteristics factor and engagement.

	Model	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
	Regression	2.569	1	2.569	11.602	.001[b]
1	Residual	21.925	99	.221		
	Total	24.494	100			
	Regression	3.588	2	1.794	8.410	.000[c]
2	Residual	20.906	98	.213		
	Total	24.494	100			

a. Dependent Variable: Student Engagement

b. Predictors: (Constant), self-regulated learning

c. Predictors: (Constant), self-regulated learning, Internet self-efficacy

Table 10: Output of multiple linear regression procedure between
the student's characteristics and engagement

Coefficients[a]

Model		Unstandardized Coefficient		Standardize Coefficient	t	Sig.
		B	**Std. Error**	**Beta**		
1	(Constant)	2.118	.443		4.780	.000
	SRL	.370	.109	.324	3.406	.001
2	(Constant)	1.763	.464		3.799	.000
	SRL	.349	.107	.306	3.262	.002
	ISE	.117	.054	.205	2.185	.031

a. Dependent Variable: Student Engagement

Level of Student's Internet Self-Efficacy (ISE)

The findings indicate a high level of ISE towards the LMS environment among the participants. This is due to the fact that students nowadays are becoming more advanced in the utilization of Internet and computer technologies. These findings showed that student's ISE is the important factor that positively affects the student's in an LMS environment. Overall in this study, the level of ISE is ranked second (M: 3.74, SD: 0.864).

In addition, from the findings it was found that student's level of confidence in browsing the web is the highest (M: 4.18). This finding shows that the students do not have any issue in browsing the Internet and this is due to the fact that most of them are in the younger age and that is why they are more Internet savvy. As expected, the similar finding was revealed by Torkzadeh and Dyke (2001).

The second highest item was their level of confidence in finding information on the web (M: 4.04). This finding indicates that students are able to use the Internet and searching for any information that they want. This claim is supported by Torkzadeh and Dyke, (2001) as the second most important factor that determines the student's ISE.

In a learning environment that supports the use of technology, ISE can affect students' preference toward learning (Liang & Tsai, 2008). In addition, most of the respondents are from the Z generation also known as the Net generation. According to Oblinger and Oblinger (2005), the Net generation has a high ability to catch-up with the development of new technology in their daily life.

Level of Student's Self-regulated Learning (SRL)

In this study, the students show a high level of self-regulated learning (M: 4.04) and it was ranked first as the most important factor in an LMS environment. The finding shows that the students can learn independently with less supervision from their instructor and this is due to the fact that they are now in a higher learning institution and their learning style are more towards students centered approach. Barnard *et al.,* (2009) examined the use of LMS and computer-based instruction and found that blended learning program can enhance students' self-regulated learning skills. This basically supports the findings indicated that these students have the high level of SRL.

The students claimed that the feedbacks from the lecturers are important to improve their work (M: 4.27). This is maybe due to the fact that they are still new in using the LMS and they need comments and feedback from their lecturers to make sure that they are doing correctly, for example, post in a forum or reply to a question. This finding is consistent with Zumbrunn, Tadlock, and Roberts (2011) research where self-regulated learners will seek out for advice and information and pursue positive learning condition than those who display less SRL in a learning environment.

The second highest statement was the students' claim that they have strategies to achieve their goal (M: 4.22). They might have their own strategies to involve in the e-learning environment, for example, involve in forum and post material. All these activities need personal involvement and required own strategies.

Student's ISE and SRL that affect Engagement in LMS environment

The research objective in this section is to identify the students' characteristics factors namely ISE and SRL that affect students' engagement in an LMS environment.

In order to analyze the data, stepwise multiple regression analysis was applied. The findings indicate that there is a significant relationship between predictor ISE and SRL toward engagement. However, the R Square value is 14.6% which is not considered as a strong predictor. From the findings, it shows that the students were less concerned with their ISE as most of them are from the Net generation or generation Z and obviously these students were more Internet savvy. Therefore, the student's does not have any problem handling the Internet based task and application. In other words, ISE is considered as the less important factor of student's engagement in an LMS environment. These findings also paralleled with other studies, which have found that students Internet self-efficacy was not the main predictor in an LMS environment, where students nowadays are more advanced in using the online application, therefore, they have the ability to engage with online learning (Kuo, Walker, Schroder, & Belland, 2014).

Furthermore, self-regulated learning also found to be a weak predictor of student's engagement although both variables are correlated between one to another. These findings might indicate that most of the students are still not ready to utilize LMS in their learning environment. This is due to the majority of the students came from the government school where most of these schools are still implementing traditional learning and face-to-face approach. Perhaps the transition from face-to-face to blended learning has confused them and their confidence level in utilizing LMS. However, the finding is inconsistent with Puzziferro (2008) study that found there is a significant relationship and strong predictor between these two variables, where self-regulated learning and students engagement are the important factors in the online learning environment, with implementing learning technology instructor have less active role in teaching and learning activities and students will engage more with online learning.

Implication of the Major Findings

Based on the findings for research objectives 1 and 2, the level of student's characteristics namely ISE and SRL towards the LMS environment was at high level. Therefore, the relevant institutions such as the university, or even the Ministry of Higher Education should not be worried about using and implementing LMS for teaching and learning purposes. This is due to the students' Internet self-efficacy and self-regulated learning had shown a high capability level Internet usage and high learning motivation. Therefore, the researcher believed that they can utilize technology and manage their learning efficiently.

Furthermore, the findings from the third objective indicated that there is a significant relationship between Internet self-efficacy and self-regulated learning towards student engagement although it was a week predictor, we can assume that there are other student characteristics factors that maybe have a direct effect in student engagement which is not investigated in this study. Moreover, population and sample are also one of the important factors to determine student ISE, SRL, and engagement which need more study and exploration. This requires further investigation in the future.

Future Study

This study is targeted the undergraduate students from the School of Educational Studies, Universiti Sains Malaysia. Thus, the findings cannot be generalized to another group of students. Future work should apply to samples from different higher learning institutions. It will also be interesting to investigate whether postgraduate students' characteristics may affect their engagement in an LMS environment. The objective of this study is to examine the students' characteristics factors namely ISE and SRL on their engagement toward the LMS environment. Therefore, there are probably several other factors and aspects that are still not covered in this study to measure engagement. Besides student's characteristics, factors such as the instructor characteristics, LMS characteristics, subject characteristics, and also peers characteristics might influence the students' engagement should be investigated.

Conclusion

In the era of 21st century teaching and learning, technology and learning application evolve at high pace, due to this revolution, cutting-edge technology somehow facilitating the approach of teaching and learning in today world. In order for the human to create a better learning tools, we need to study and understand the interaction between human and technology. In this study researcher only focuses on student's characteristics ISE and SRL and their engagement in an LMS environment. However, this is only one of many scopes that we need to look for in order for us to have more understanding about the use of technology and human interaction. Based on this study we believed that we have solved one of many pieces of issue surrounded by human and technology interactions. Thus, more study is needed in order for us to develop more engaging and practical application for teaching and learning.

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