

Assessing postgraduates' acceptance and usage of a learning management system

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ABSTRACT

The study examines the acceptance and the usage of a new learning management system (LMS) among postgraduates of a public university in Malaysia. A quantitative method was employed in which a questionnaire was used to collect the data. Two hundred and ninety-seven samples of students were randomly selected from nine hundred and twenty-one students. A statistical package for social science version 22 and descriptive statistics were used to determine the acceptance and extent to which students are intended to use the LMS. The descriptive statistics revealed that students are willing to use the new LMS in their educational activities. They were able to download and access the lecture notes through the LMS as well as upload and submit their assignments using LMS. In addition, the findings revealed that students enjoyed using LMS and it fitted their learning styles. However, students believed that if the university's internet connection could be upgraded, students could have had a more enjoyable experience in using the new LMS. The findings might be useful for LMS managers, faculty members, and university management, to understand the level at which students accept and utilize the new LMS. This would also help the university authority to upgrade and improve the compatibility of the system and develop appropriate policies and strategies to encourage long-term usage of the LMS. Having limited and few studies of a newly implemented LMS, this study could identify not only the extent to which students are accepted and use the new LMS but also reveal that students' perception of performance expectancy is critical for acceptance and usage of the new LMS.

Keywords: acceptance, usage, LMS, postgraduates

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INTRODUCTION

The recent development of information and communication technologies (ICT) integration in education has significantly changed the methods of teaching and learning in most higher education institutions across the world (Bello et al., 2023; Dauda & Samaila, 2019). This also led to the adoption of a learning management system (LMS) across the institutions (particularly higher education institutions). The history of acceptance and utilization of LMS was started by American institutions in the early 1990s, and this is to increase the quality of teaching and learning activities (Masood et al., 2022; Samaila et al., 2022). More than 94% of colleges and universities in the UK and 90% of higher education institutions in the USA have been adopting and utilizing LMS (Al-Busaidi & Al-Shihi, 2010; Samaila & Al-Samarraie, 2024).

Alias and Zainuddin (2005) defined LMS as "a software application or web-based technology used to plan, implement, and assess a specific learning process" (p. 28). LMS can be referred to as educational software that assists lecturers in teaching, communicating and monitoring the

progress of each student. It can also be referred to as a platform where students' progress and records are processed, monitored and kept (Samaila et al., 2017). Teachers use the platform to trace the progress of the students as well as to evaluate the academic performance of the students (Samaila et al., 2022). Teaching and learning ought to be simple with the help of the LMS platform—lecture notes, videos, assignments, tests and examinations can easily be uploaded via the platform, and students may easily access the materials. Due to the introduction of LMS in education, the majority of the lecturers and teachers have changed their method of teaching from the traditional method of teaching to blended learning, e-learning or flipped learning.

A public university in Malaysia has been using a particular LMS for a long period; the system has become old and outdated. It needed more features and more compatibility. Therefore, in early 2015, the university adopted the new LMS was introduced. The new LMS possesses extra features such as chat, two-way forum, database, feedback, glossary, lesson, questionnaire, survey and wiki that could improve the quality of teaching and learning (Samaila et al., 2024). It helps the lecturers to upload the course materials and gives room for assessing

students online. It allows the students to register their courses online as well as submit their tests, quizzes, assignments or examinations online. In fact, the system has numerous important applications, yet there is a need to investigate the extent to which students accept and utilize the system.

Moreover, this study investigates performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating condition (FC) of the post-graduate students' use of new LMS. The result of the study may be useful for faculty members, lecturers, LMS managers, and university management, to identify important factors and develop appropriate policies and strategies to encourage long-term usage of the LMS for future studies and lifelong learning. Furthermore, the success of new learning technology cannot be achieved if students do not accept and use the resources appropriately. Asamoah et al. (2024) concluded that if the students do not properly use technology, then it would be a loss of funds, waste of resources and students' setbacks in terms of technology usage.

Recently, many universities across the world have given more consideration to using technological innovations such as LMS, Web-based learning and e-learning tools in order to facilitate the teaching and learning process (Samaila et al., 2018). LMS is an important system that allows both lecturers and students to upload and download learning materials (Ross, 2019; Samaila et al., 2021a). Universiti Putra Malaysia is among the public universities in Malaysia that implement LMS to improve the quantity and quality of teaching and learning. Researchers like Muruthy and Yamin (2017) recommend that students' acceptance and intention to use technology could be measured when the new technology was used for at least six to seven months old. A public university in Malaysia has recently implemented a new LMS, and there are few or no empirical studies conducted to investigate the students' acceptance and usage of the new LMS; this seeks to investigate the acceptance and usage of LMS by postgraduate students. Four variables were adapted from the original unified theory of acceptance and use of technology (UTAUT) model: PE, EE, SI, and FC.

Many researchers have utilized the model to examine students' acceptance and adoption of technology. The results could be useful for LMS managers, faculty members and university management, to understand the level at which students accept and utilize the new LMS. This would also help the university authority to upgrade and improve the compatibility of the system.

LITERATURE REVIEW

There are two general licensed LMSs. The first one is WebCT, established by a university instructor at the University of British Columbia. WebCT uses a "standard web-based shell or learning management system" (Bates & Sangra, 2011; Samaila et al., 2021b). The second LMS is Blackboard, which swallowed WebCT within a short period. The Blackboard was created in 1997 by Pittinsky and Chasen. A study conducted by Esawe et al. (2023) revealed that more than 70 percent of higher learning institutions in the USA used Blackboard as their LMS. It was also reported that only two Malaysian universities use Blackboard as their LMS; the first one is a public university, Universiti Tun Hussein Onn, and the second one is a private university, Sunway University College.

Today, several universities adopt LMS, and several studies have been carried out. Scholars argued that not only technological equipment

or software/hardware, but also influenced human perception and beliefs play a greater role in technology acceptance and usage. This study employs the UTAUT to assess the postgraduate students' acceptance and usage of LMS. UTAUT consists of performance expectation, effort expectation, SI, FC, behavioral intention (BI), and use behavior. These constructs have been used by different scholars, particularly by AL-Nuaimi et al. (2024), on the application of ICT and computer usage. Ahmad et al. (2024) also used UTAUT to investigate the social effect of ICT adoption and non-adoption. Das and Datta (2024) used UTAUT to investigate the adoption readiness of mobile devices. For this study, four variables were adapted from the original UTAUT model. These are PE, EE, SI, and FC.

Performance Expectancy

PE is defined as a degree to which the learners believe that LMS will help them to do better in their programs. PE or perceived usefulness is the degree to which students perceive that using technology will increase the quality of their learning. Past studies have recognized the power of PE in explaining students' acceptance and usage of technology in both intended and compulsory settings (Venkatesh et al., 2016). Amin et al. (2016) study reported that students believed LMS is useful and helps them to have better learning experiences. Accordingly, students believed that LMS could assist them in completing their tasks on time, increase their performance and improve the effectiveness and efficiency of teaching and learning.

Effort Expectancy

EE refers to the degree to which learners believe the system (PutraBlast) is easier or difficult to accept and use. Studies show that EE was among the important elements that convinced the students to accept or reject technology (Venkatesh et al., 2016). Based on the literature review, the EE was found to be the same with perceived ease of use of TAM, and in most cases, it was found to have a significant positive relationship with the users' actual use of ICT (Ifinedo, 2006). A study by Samaila et al. (2022) revealed that students accepted and used LMS because they found it easy and effortless to use.

Social Influence

SI refers to how learners will significantly be influenced by their colleagues, environment, course instructors, and institutions in order to accept and use technology in teaching and learning processes. SI can be referred to as subjective norms, social factors and image. Previous studies indicate that SI had a positive effect in determining the acceptance and usage of technology (Venkatesh et al., 2016). Raman and Don (2013) conducted research on 65 post-graduate students at Universiti Utara Malaysia to investigate the level of acceptance and use of LMS. Results showed that PE, EE, SI, and FC are the most influential factors toward students' acceptance and usage of LMS.

Facilitating Condition

FC means the extent to which students see that the technical infrastructures and institutional materials such as Internet, computers and wireless are available to support the use of the system (PutraBlast). A study conducted by Ahmad et al. (2024) on 'Learning management system acceptance factors for technical and vocational education training (TVET) institutions'. The results showed that FC had a strong effect on LMS usage. This indicated that functional technical infrastructures and institutional materials encouraged learners to accept and use technology in their daily academic activities. However, a study

Table 1. Descriptive statistics of PE

No	Item	Frequency (percentage)					M	SD
		SD	D	SM	A	SA		
1	Using LMS improves my academic achievement.	12 (4.3%)	40 (14.4%)	95 (34.3%)	112 (40.4%)	18 (6.5%)	3.30	.94
2	LMS makes it easier for me to learn at university.	10 (3.6%)	18 (6.5%)	62 (22.4%)	134 (48.4%)	53 (19.1%)	3.72	.96
3	LMS gives me more control over my learning.	11 (4.0%)	38 (13.7%)	69 (24.9%)	130 (46.9%)	29 (10.5%)	3.46	.98
4	LMS helps me to learn more efficiently.	11 (4.0%)	34 (12.3%)	72 (26.0%)	125 (45.1%)	34 (12.3%)	3.64	2.62
5	LMS system makes my learning more effective.	13 (4.7%)	29 (10.5%)	74 (26.7%)	129 (46.6%)	32 (11.6%)	3.49	.98
6	LMS provides some good functions to help me complete my learning tasks.	10 (3.6%)	24 (8.7%)	67 (24.4%)	136 (49.1%)	40 (14.4%)	3.62	.95
7	Using the LMS enables me to accomplish tasks more quickly.	14 (5.1%)	35 (12.6%)	79 (28.5%)	114 (41.2%)	35 (12.6%)	3.43	1.02
Overall							3.52	1.20

Note. SD: Strongly disagree; D: Disagree; SM: Somehow agree; A: Agree; & SA: Strongly agree

by Hsu (2012) evaluated students' acceptance and use of Moodle and reported that FC were found to be insignificant for students to decide whether to accept and use LMS.

Research Questions

1. **RQ1.** What is the extent of PE of the postgraduate students to use the new LMS?
2. **RQ2.** What is the extent of EE of the postgraduate students to use the new LMS?
3. **RQ3.** What is the extent of SI of the postgraduate students to use the new LMS?
4. **RQ4.** What is the extent of facilitating the condition of the postgraduate students to use the new LMS?

METHODOLOGY

A descriptive research design was used to investigate the acceptance and usage of a new LMS among postgraduate students at the public university in Malaysia. Descriptive research assists to accurately and systematically describe a population, situation or phenomenon. It can use a wide variety of research methods to investigate one or more variables. Unlike in experimental research, the researcher does not control or manipulate any of the variables, but only observes and measures them. A quantitative method was employed in which a set of questionnaires was used to collect the data. The questionnaire was adopted from the work of Venkatesh (2003). Reliability of the instrument comprises of BI (.932), PE (.954), EE (.930), SI (.876), and FC (.884). A random sampling technique was used to select two hundred and ninety-seven samples of students from a total population of nine hundred and twenty-one students. Using simple random sampling allows researchers to generalize about a specific population and leave out any bias. The participants are exposed to the new LMS that was recently implemented. Four variables (PE, EE, SI, and FC) from the UTAUT model were adopted. A statistical package for social science version 22 and descriptive statistics were used to assess the level of acceptance and usage of LMS.

FINDINGS

Performance Expectancy

RQ1. What is the extent of PE of the postgraduate students to use the new LMS?

Results from **Table 1** show that more than one-third of the students believed that using LMS increases their academic performance (40.4%, mean [M] = 3.30, standard deviation [SD] = .94). Almost half of the

students agreed that learning becomes simple and easy as a result of LMS (48.4%, M = 3.72, SD = .96), the third item "LMS gives me more control over my learning" indicated that only a few students were not able to control their learning activities using LMS (13.7%, M = 3.46, SD = .98), more than one-third of the students believed that LMS help them to learn more effectively and efficiently (45.1%, M = 3.64, SD = 2.62). Almost half of the students recommended that LMS has many functions that help them to complete their tasks (49.1%, M = 3.62, SD = .95) and more than one-third of the students understood that using LMS enables them to accomplish their tasks quickly (41.2%, M = 3.43, SD = 1.02). However, the overall mean PE is 3.52 (SD = 1.20). This indicates that LMS (PutraBlast) is useful and assists students to complete their tasks.

Effort Expectancy

RQ2. What is the extent of EE of the postgraduate students to use the new LMS?

Table 2 shows that more than one-third of the students believed that the process of using LMS is clear (46.6%, M = 3.47, SD = 1.01). Half of the students indicated that the process of using LMS is understandable (49.5%, M = 3.44, SD = .95). The third item "I would find it easy to get the LMS to do what I want it to do" (38.3%, M = 3.35, SD = .94). Only a few students believed that using LMS require deep thinking (15.5%, M = 3.54, SD = .94). Few students disagreed that LMS helps them to become skillful (10.8%, M = 3.36, SD = .98) but more than half of the students indicated that learning to use LMS is easy (52.3%, M = 3.61, SD = .92). Less than one-third of the students indicated that LMS is not easy to handle whenever they got problems (13.4%, M = 3.36, SD = .98), while more than one-third of the students agreed that it is easy to download the materials from LMS (46.9%, M = 3.80, SD = .93). This is similar to the item number 9, where students indicated it is easy to upload the materials in LMS (44.8%, M = 3.52, SD = .89). Moreover, the overall mean of EE is 3.52 (SD = .94). In summary, the descriptive statistics suggested that majority of the students reported that LMS (PutraBlast) is easy and effortless to use. However, few students found it difficult whenever they encountered problems while using LMS.

Social Influence

RQ3. What is the extent of SI of the postgraduate students to use the new LMS?

Students were asked to indicate to what extent their colleagues or lecturers influenced them to use LMS. Results from **Table 3** show that more than one-third of the students think to use LMS (39.4%, M = 3.49, SD = .099). Almost half of the students were persuaded by their supervisors to use LMS (46.4%, M = 3.71, SD = .93), while one-third of

Table 2. Descriptive statistics of EE

No	Item	Frequency (percentage)					M	SD
		SD	D	SM	A	SA		
1	The process of using LMS is clear.	14 (5.1%)	33 (11.9%)	69 (24.9%)	129 (46.6%)	32 (11.6%)	3.47	1.01
2	The process of using LMS is understandable.	11 (4.0%)	26 (9.4%)	72 (26.0%)	137 (49.5%)	31 (11.2%)	3.54	.94
3	I would find it easy to get the LMS to do what I want to do.	12 (4.3%)	30 (10.8%)	83 (30.0%)	126 (45.5%)	26 (9.4%)	3.44	.95
4	My interaction with LMS does not require me to think a lot.	8 (2.8%)	43 (15.5%)	95 (34.3%)	106 (38.3%)	24 (9.0%)	3.35	.94
5	It is easy for me to become skillful at using LMS.	12 (4.3%)	30 (10.8%)	103 (37.2%)	102 (36.8%)	30 (10.8%)	3.38	.96
6	LMS is easy to handle whenever I encounter a problem.	13 (4.7%)	37 (13.4%)	88 (31.8%)	113 (40.8%)	26 (9.4%)	3.36	.98
7	Learning to use LMS is easy for me.	10 (3.6%)	22 (7.9%)	67 (24.2%)	145 (52.3%)	33 (11.9%)	3.61	.92
8	It is easy to download the materials from LMS.	5 (1.8%)	16 (5.8%)	68 (24.5%)	130 (46.9%)	57 (20.6%)	3.80	.93
9	It is easy to upload the materialism LMS.	8 (2.9%)	23 (8.3%)	92 (124%)	124 (44.8%)	30 (10.8%)	3.80	.93
Overall							3.52	.94

Note. SD: Strongly disagree; D: Disagree; SM: Somehow agree; A: Agree; & SA: Strongly agree

Table 3. Descriptive statistics of SI

No	Item	Frequency (percentage)					M	SD
		SD	D	SM	A	SA		
1	My lecturers think that I should use LMS.	8 (2.9%)	12 (4.3%)	69 (24.9%)	113 (40.8%)	75 (27.1%)	3.86	1.01
2	My friends who have influenced on my behavior think that I should use LMS.	20 (7.2%)	43 (15.5%)	96 (34.7%)	98 (35.7%)	20 (7.2%)	3.19	1.02
3	People respect me if I use LMS.	46 (16.6%)	58 (20.9%)	102 (36.8%)	62 (22.4%)	9 (3.2%)	2.74	1.08
4	My lecturers are very supportive of the use of the LMS for my academic issues.	7 (2.5%)	20 (7.2%)	69 (24.9%)	129 (46.4%)	52 (18.8%)	3.71	.93
5	My supervisor is very supportive of the use of the system for my research.	12 (4.3%)	36 (13.0%)	94 (33.9%)	100 (36.1%)	35 (12.6%)	3.39	1.00
6	My supervisor thinks that I should use LMS.	11 (4.0%)	29 (10.5%)	89 (32.1%)	109 (39.4%)	39 (14.1%)	3.49	.99
7	The university supports using LMS in my study.	11 (4.0%)	19 (6.9%)	84 (30.3%)	117 (42.2%)	46 (16.6%)	3.60	.97
Overall							3.22	1.00

Note. SD: Strongly disagree; D: Disagree; SM: Somehow agree; A: Agree; & SA: Strongly agree

the students indicated that their friends influenced them to use LMS (35.7%, $M = 3.19$, $SD = 1.02$). Some categories of the students believed that the university supports them to use LMS (42.2%, $M = 3.60$, $SD = .97$). Only a few students believed that people respect them when they use LMS (22.4%, $M = 2.74$, $SD = 1.08$). Almost half of the students indicated that their lecturers support them in using LMS (46.4%, $M = 3.71$, $SD = .93$). The overall mean of SI is 3.42 ($SD = 1.00$). This indicated that friends, supervisors, and lecturers were good elements in influencing students to use LMS (PutraBlast).

Facilitating Condition

RQ4. What is the extent of facilitating the condition of the postgraduate students to use the new LMS?

Table 4 revealed that not up to one-third of the students agreed there were enough computers to use in the university (31.4%, $M = 3.19$, $SD = 1.02$). Similarly, few students agreed to the availability of the computers to practice on the LMS at the university (30.7%, $M = 3.15$, $SD = 1.00$). More than one-third of the students used the university network to access the LMS (37.2%, $M = 3.19$, $SD = 1.12$). However, a significant number of students indicated that the university's Internet speed is not satisfactory for using LMS (29.2%, $M = 2.99$, $SD = 1.21$). More than two-thirds of the students indicated that they could not enable access to computers for using LMS (32.1%, $M = 3.22$, $SD = 1.11$). Almost half of the students revealed that they have enough knowledge to access LMS (43.7%, $M = 3.50$, $SD = .98$), but less than half of the students showed that there was special instruction concerning the use of LMS (37.5%, $M = 3.28$, $SD = 1.03$). More than one-third of the students indicated that LMS fits their learning style (41.5%, $M = 3.40$, $SD = 1.03$). The overall mean of the FC is 3.24 ($SD = 1.06$), and this demonstrated that the postgraduates perceived this factor as important. Although the analysis suggested that students enjoyed using LMS and that it fits their learning styles, the university needs to provide more

computers and good Internet and wireless networks to enable students to use LMS (PutraBlast) conveniently.

DISCUSSION

This study reported that the overall mean of PE was found to be high ($M = 3.52$), and this shows students have a positive perception toward the application of LMS in the teaching and learning process. Nearly half (44.4%) of the students believed that using LMS increases their academic performance. The outcome of this study is in line with that of AL-Nuaimi et al. (2024) and Samaila et al. (2017) who reported that LMS helps students to complete their learning task in time and improve their learning outcomes. However, there are few students (14.4%) who agreed that using LMS could not improve their academic performance. The overall mean of EE ($M = 3.52$) shows an indication of the simplicity of the new LMS. This is also an indication that postgraduates perceived LMS as easy and effortless to use. This is similar to the findings of Samaila et al. (2022) who described that most of the students believed LMS was friendly and easy to use. Although the results of this study are contrary to the study of Bhalalusesa et al. (2013) conducted in Africa at Open University Tanzania, 54% of the students believed that LMS could have been more friendly and easier to use. Furthermore, the result showed that only one third (40.8%) of the students were able to handle LMS when got problems. The majority of the students needed help to handle the LMS when they had problems (Ahmad et al., 2024). Therefore, university management and faculty members should provide ICT experts who could help the students when needed.

SI is a situation in which the students believe that colleagues or lecturers influence them to use the new LMS. The overall mean ($M = 3.42$) of SI indicated that supervisors and lecturers could influence their

Table 4. Descriptive statistics of FC

No	Item	Frequency (percentage)					M	SD
		SD	D	SM	A	SA		
1	The process of using LMS is clear.	17 (6.1%)	47 (17.0%)	102 (36.8%)	87 (31.4%)	24 (8.7%)	3.19	1.02
2	The process of using LMS is understandable.	18 (6.5%)	47 (17.0%)	106 (38.3%)	85 (30.7%)	21 (7.6%)	3.15	1.00
3	I would find it easy to get the LMS to do what I want to do.	26 (9.4%)	73 (26.4%)	49 (17.7%)	103 (37.2%)	26 (9.4%)	3.19	1.12
4	My interaction with LMS does not require me to think a lot.	42 (15.2%)	75 (27.1%)	52 (18.8%)	81 (29.2%)	27 (9.7%)	2.99	1.21
5	It is easy for me to become skillful at using LMS.	23 (8.3%)	46 (16.6%)	86 (33.0%)	89 (32.1%)	33 (11.9%)	3.22	1.11
6	LMS is easy to handle whenever I encounter a problem.	13 (4.7%)	25 (9.0%)	83 (30.0%)	121 (43.7%)	35 (12.6%)	3.50	.98
7	Learning to use LMS is easy for me.	15 (5.4%)	44 (15.9%)	90 (32.5%)	104 (37.5%)	24 (8.7%)	3.28	1.03
8	It is easy to download the materials from LMS.	14 (5.1%)	40 (14.4%)	76 (27.4%)	115 (41.5%)	32 (11.6%)	3.40	1.03
Overall							3.24	1.06

Note. SD: Strongly disagree; D: Disagree; SM: Somehow agree; A: Agree; & SA: Strongly agree

students to accept and use LMS. Raman and Don (2013) agreed with the finding that lecturers and supervisors played a significant role in persuading their students to adopt and use LMS in the learning process. The result indicated that not all students (35.7%) believed that their colleagues influenced them to accept or use LMS. The FC is the extent to which the students believe that technology and other infrastructure exist to maintain the use of the LMS. The overall mean of FC was ($M = 3.24$). This indicates that the postgraduate students somehow believed that the technology and other infrastructure exist to maintain the use of LMS. This is in line with the assertion of Das and Datta (2024), who reported that students cited technological infrastructures as one of the bases for accepting and using LMS. The result showed that the majority of the students believed there were no adequate computers to support the use of LMS in the faculty (Asamoah et al., 2024). Moreover, a significant number of the students agreed that there were no adequate Internet/wireless/networks to use LMS, particularly in the faculty. The university management and other relevant stakeholders need to provide adequate the Internet/wireless/network for students to access the LMS easily.

Recommendation for Future Research

Based on the findings of this study, there is a need to conduct future research in order to overcome the limitations of this research. The research was purely quantitative, and data was collected through self-reported questionnaires. Therefore, the future research should improve the questionnaire design by using a different type of scale or adding more items. Qualitative studies comprising observation, interview, and recording could be employed in future studies to obtain the data in dissimilar ways and to provide in-depth and sympathetic findings.

CONCLUSION

This study explains the importance of using the UTAUT model to describe students' acceptance and usage of LMS. It is noticed that the majority of the students understand the application of LMS and how it affects their academic performance. It is also understood from the findings that students could not accept or use LMS if it is difficult to operate or not user-friendly. Lecturers and supervisors were cited as important figures to convince students to use LMS. The availability of technological infrastructures and ICT facilities could influence students to accept and use LMS. In the end, the researchers call upon the government, university management and any other relevant stakeholders to improve Internet connections for students to access the LMS easily. Additional computer laboratories and ICT centers need to be built to support better accessibility of LMS.

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Data availability: Data generated or analyzed during this study are available from the authors on request.

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