Factors Related to Faculty Members' Attitude and Adoption of a Learning Management System

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ABSTRACT
Learning Management Systems (LMS) play a crucial role in organizing the course contents. However, some instructors use LMS in their classes while some do not. This study aimed to discover the factors in relation to the instructors' attitude toward LMS and adoption of LMS in their course. A survey was administered to 62 instructors to follow up the use of LMS after they attended the training. The respondents were assessed for their attitude towards LMS, perceived ease of LMS use, perceived usefulness and their actual use of LMS in their course. The results reveal that the respondents of the study had a high overall attitude towards LMS. Perceived ease of LMS use and perceived usefulness were found to have a significant positive correlation with their attitude. In addition, the more the instructors perceived ease of LMS use, the more intensively their beliefs about the usefulness of it increased. However, it was found that attitude toward LMS, perceived ease of use and perceived usefulness were not correlated to actual use of LMS. Furthermore, there was not any significant difference in the respondents' attitude toward LMS in terms of gender and subject domain. The responses to open-ended questions were revealed in terms of difficulties they had when using LMS.
Keywords: instructor's attitude, LMS use, educational technology, perceived usefulness, ease of use

INTRODUCTION

Nowadays, online learning has been more in a form of formal and group learning. Instructors can put their materials on their web and communicate with students using emails. Among newly developed Web 2.0 applications, a learning management system is a promising tool for transforming face-to-face courses to online instruction. According to Laster (2005), the term Learning Management System (LMS) is a self-contained webpage with embedded instructional tools that permit faculty to organize academic content and engage students in learning. It enables course sites to be created (Sclater, 2008). Most educational institutions especially at university level have been using an LMS to provide students with a space for online learning. A perceived benefit of using an LMS is the ability to instruct online using a variety of modalities to meet learners' diverse needs (Mullinix & McCurry, 2003). LMS can provide a challenge for instructors with differentiated instruction. An LMS permits faculty to incorporate multimedia elements including audio recordings, music, video, text, interactivity, and sequencing (Klemm, 1998). Furthermore, as stated by Mullinix and McCurry, the potential uses of an LMS to improve the teaching and learning process include increased access to course content and improved communication among professors and students. As noted by O'Quinn and Corry (2002) who support Mullinix and McCurry's findings, a web-based course expands the learning time because content is readily accessible. Previous studies found that educational technology like LMS can support the instructional process; it assists faculty in managing courses and organizing content to engage students and decrease planning time (Ayers & Doherty, 2003; Jafari, McGee, & Carmean, 2006; Oliva & Pawlas, 2005).

Basically, LMS can be categorized into three main types: study skills tools, communication tools, and productivity tools. Tools for study skills include the authoring modules to create activities or materials for learners. In general this category of tools covers quizzes, online materials presentations, assignments, and tasks. The quiz module has such many functions as a question database, feedback, scoring and tracking of students' progress. The second tool category in an LMS is communication tools. This category includes the means of communication available for instructors and learners. Such communication tools enable the learners to interact with their classmates or with their instructors. The most commonly available communication tool is announcement. This tool is used to give all learners any new information about the course, including the latest news and upcoming events. Usually, this tool is presented on the first page after the students log in to the LMS. Another common communication tool is discussion board. This is a forum of communication where both instructors and learners can post their messages and read the comments from others. In conclusion, the instructor has the authorization to upload content to the site, organize the materials that reflect the course, open discussion groups, and manage the information which includes the option to delete inappropriate content from it.

Nowadays, two kinds of LMS are employed by faculty members in higher educational institutions. Some use departmental web sites (Britain & Liber, 1999) while the others use commercial Learning Management Systems (LMSs). The commercial LMSs might not work well with learners since they are usually designed for the use in distance education in general. The context of Second Language Acquisition (SLA) is rather different from that in other subject domains. It needs an LMS that accommodates "not only input and output of the character set of the target language, but also some other learning tools such as discussion boards, vocabulary activities, grammar clinics, online dictionaries, and writing draft books, feedback and assessment tools; all organized around the learning activities and communicative practice in all four language skills (Sawatpanit, Suthers, & Fleming, 2004). When an LMS is applied in any language courses, it can be more than course management. It is like a space or a platform of language improvement.

According to Saricoban (2013), one of the most important aspects of language instructors in the educational setting is to become familiar with ICT, which equips them with the techniques and strategies for using computers in their classrooms. Despite the benefits of integrating an LMS in the teaching course, many faculty members lack knowledge of effective ways of using an LMS to enhance teaching. There has been reluctance in adopting it as a teaching tool. As Gautreau (2011) states, many faculty members are not motivated to use LMS for a variety of reasons. The reasons will vary depending on demographics and certain factors that are important to faculty. For instance, many studies indicate that attitude towards technology are key factors in the adoption and use of technology, specifically an LMS, by faculty (Lawler & King, 2003; Nasser, Cherif & Romanowski, 2011; Rogers, 1995). In addition, Teo (2009) points out that instructors' attitude and willingness to embrace technology has a great effect on students' success in learning with technology in the classroom. Instructors act as drivers in the effective integration of technology, both for teaching and learning in educational settings.

Theoretical Framework

The research model in this study was based on the Technology Acceptance Model (TAM) developed by Davis (1985) which is a theoretical framework for predicting the early adoption of new computer technologies that can be used in various situations and in different contexts (Teo, 2009). Davis devised three factors impacting user acceptance of a new computer technology which this research focused on. The first factor was Perceived Usefulness (PU); the second was Perceived Ease of Use (PEOU); and lastly the Attitudes toward Usage (ATU) of a new system (Davis, 1989). PEOU is defined as how easy the user perceives the new technology is to use (Park, 2009). Perceived Usefulness (PU); however, is defined as the user's belief that the technology will improve their performance (Lee & Lee, 2008). The attitude toward technology (ATU) resulting in behavioral intention on whether to use or not use the technology is another determining factor to be explored (Nov & Ye, 2008). The model proposes that perceived ease of use and usefulness of new technology affects attitudes toward the technology, which is an antecedent to behavioral intentions to use it. In many studies, relationships were found among these factors. For example, perceived ease of use had a significant influence on attitude towards usage (Chang et al., 2012; Park, 2009) and perceived usefulness (Shroff et al., 2011). Perceived ease of use was found to indirectly impact intention to use through increased perceived usefulness (Lee et al., 2011; Sek et al., 2010). Perceived usefulness was a direct determinant of intention to use (Liu et al. 2005). Similarly, Ng, Shroff, & Lim (2013) found that attitude towards usage evidenced a direct relationship to behavioral intention to use.

Another factor which was taken into account in this study is gender. It was found that males and females experienced the online learning environment quite differently. Some scholars reported that females demonstrated negative attitudes and less confidence in using technology (Anderson & Haddad, 2005; Dhindsa & Shahrizal-Emran, 2011; Li & Kirkup, 2007). While a study found that females have been demonstrating better use of computer-mediated platforms like Blackboard and have been outperforming males academically (DeNeui & Dodge, 2006), another one found no significant difference in engagement in a discussion forum between males and females **(**Machado, 2011). Since this study collected data from instructors who had attended the training course of LMS from different faculties, the issue of teaching field or subject domain they possessed should be taken into consideration.

With the widespread use of LMS to support teaching and learning in today's classroom, the present study was designed to explore the factors that were assumed to have an impact on the attitude toward usage and actual use of LMS of instructors in a private university. Since the main issue to be emphasized in the current study was willingness to adopt new technology, the following model was developed to explain considerable factors as seen below:

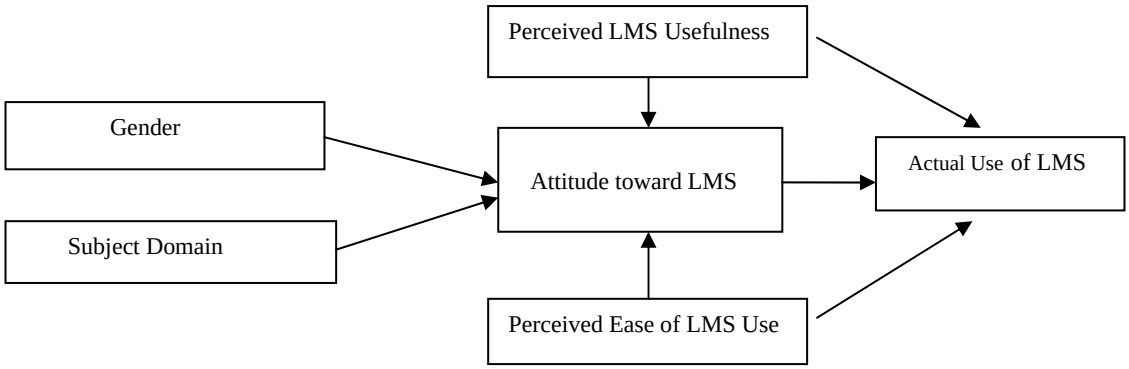

Figure1. The Research Model

Research Questions

The study aims to answer the six research questions as follows:

1. What are the instructors' attitude toward LMS, perceived ease of use, and perceived usefulness?
2. Are there any differences in the instructors' attitude toward LMS between two groups: males and females?
3. Are there any differences in the instructors' attitude toward LMS between two groups: those teaching language courses and those teaching in other subject domains?
4. Are there any relationships between the instructors' attitude toward LMS, perceived ease of use, perceived usefulness, and their actual use of LMS in their course?
5. What are the difficulties faced by the instructors in using LMS?
6. What are the main reasons why the instructors did not use LMS in their course and which technology they chose instead of LMS?

Research Hypotheses

H1: Gender has an effect on attitude toward LMS.
H2: Subject domain has an effect on attitude toward LMS.
H3: Perceived usefulness is related to attitude toward LMS.
H4: Perceived ease of LMS use is related to attitude toward LMS.
H5: Perceived ease of use is related to perceived usefulness.
H6: Attitude toward LMS is related to actual use.
H7: Perceived usefulness is related to actual use.
H8: Perceived ease of use is related to actual use.

METHODOLOGY

Respondents

The respondents in this study consisted of 62 instructors from a private university in Thailand. When an LMS (Moodle) was first introduced to our university in 2013, the Computer Center of the university organized the training for all faculty members. Since it is the policy of our university that instructors make use of technology in their teaching, this study was, therefore, conducted to follow up the use of LMS by instructors in the first semester of 2014 academic year or after one year of training. All respondents signed consent forms, and they were assured that all data would be confidential.

Instrumentation

The instrument of this study was a questionnaire comprising three main sections. It was designed by the researcher after an extensive review of the related literature. The first section contained personal data concerning age, gender, teaching field, educational level, and years of teaching experience. Section Two consisted of 21 items that measured "perceived ease of use" (8 items), "perceived usefulness" (5 items), and attitude toward LMS (8 items). The questionnaire item responses were constructed on a five-point Likert scale from strongly agree (=5) to strongly disagree (=1) for three subsections comprising "perceived usefulness", "attitude" and "perceived ease of use." However, the subsection of "actual LMS use" provided two response of "yes" and "no." The third section of the questionnaire asked the respondents to respond to two open-ended questions. The first question asked those using LMS about the difficulties they faced. The second one asked those who did not use LMS about the reasons why they did not use it and which technology they used instead of LMS.

Validity and Reliability of the Instrument

The initial draft of the study instrument was written in English. It was then translated into Thai as the respondents were native speakers of Thai. In order to ensure the validity of the questionnaire, only the Thai version was handed out to a group of five referees specializing in the fields of instructional technology and education. Taking their comments into consideration, those changes deemed essential were made. Some items were added and others removed. Finally, there were 21 Likert scales items in section 2 which were processed with 40 non-subject instructors to estimate the reliability of the questionnaire. Internal consistency measures were computed using the Cronbach's alpha method for the questionnaire. Consequently, the reliability of this questionnaire was 0.79, indicating a high level of internal consistency. Therefore, the study could be continued with the real group of instructors.

Data Analysis

Data were statistically recorded and analyzed by SPSS/Windows program. Personal information of the participants was calculated for frequency and percentage. To answer the first question, means and standard deviations were analyzed to find out the instructors' attitude toward LMS, perceived ease of use and perceived usefulness while independent samples t-tests were utilized to answer the second and third research questions. Pearson Correlation Coefficients were used to answer the fourth research question. This was done to find relationships between the instructors' attitude toward LMS, perceived ease of use, perceived usefulness and their actual use of LMS in their courses. An open-ended question included in the questionnaire were read, coded, re-read, and categorized into bins by question (Miles & Huberman, 1994).

FINDINGS

PART I: THE RESPONDENTS' INFORMATION

Of all respondents, 30 instructors teach English languages while 32 are instructors in other subject domains. They were asked to reply to the questionnaire. It was found that out of 62 instructors surveyed, 13 of them used to work with the old version of LMS. There are 26 males and 36 females. With regard to their qualifications, most of them (n = 45) are on the master's degree level, whereas some of them (n = 10) have a bachelor's degree and the rest (n = 7) have a doctoral degree. Moreover, 12 instructors have long teaching experience (more than 10 years) while 28 have moderate experience (6–10 years), and 22 have short teaching experience (less than 6 years). The survey shows that 41 instructors have used an LMS while 21 instructors have not engaged in using an LMS in their current courses.

PART II: RESPONSES FROM THE QUESTIONNAIRE

Research Question 1: What are the instructors' attitude toward LMS, perceived ease of use, and perceived usefulness?

Table 1 shows the overall mean score of attitude toward LMS which was at high level (Mean = 4.16). The first highest mean score fell on item no. 2 (LMS enables the materials to be organized in a structure planned by the instructor), followed by item no. 3 (LMS makes communication more convenient), and item no. 4 (LMS provides a space where learning can take place independently). The lowest mean scores were on items no. 7 (LMS increases motivation for learning English language).

Table 1: Mean and Standard Deviation of Attitude toward LMS

Attitude toward LMS	Mean	SD	Level	Order
1. The use of LMS provides the instructor with many different tools to assess learning.	4.08	1.24	high	5
2. The use of LMS enables the material to be organized in a structure planned by the instructor.	4.74	.70	very high	1
3. The use of LMS makes communication more convenient.	4.44	.50	high	2
4. The use of LMS provides a space where learning can take place independently.	4.40	.49	high	3
5. The use of LMS makes learning easier.	4.35	.48	high	4
6. The use of LMS increases interaction among students and instructor.	4.06	.74	high	6
7. The use of LMS increases motivation for learning English language.	3.42	1.18	moderate	8
8. The use of LMS produces new models of teaching and learning.	3.82	1.05	high	7
Total	**4.16**	**.25**	**high**	

Table 2 demonstrated the overall mean score of instructors' perceived ease of LMS use which was at a high level (Mean = 4.04). When considering each item, it was found that the three activities they perceived easy the most were posting messages on forum, uploading or removing files, and looking at students' attendance repot. These three items were at a high level. The lowest mean score was on contacting students through emails in LMS.

Table 2: Mean and Standard Deviation of Instructors' Perceived Ease of LMS Use

Perceived Ease of LMS Use	Mean	SD	Level	Order
1. uploading or removing files	4.34	.48	high	2
2. posting and replying messages on forum	4.48	.50	high	1
3. chatting with students	3.66	.92	high	7
4. creating exercises or quizzes	4.13	.71	high	5
5. editing the course content	4.19	.60	high	4
6. looking at students' attendance report	4.27	.45	high	3
7. putting a link to website sources	4.00	.77	high	6
8. contacting students through emails	3.15	1.04	moderate	8
Total	**4.04**	**.34**	**high**	

Table 3 demonstrated the overall mean score of instructors' perceived usefulness of LMS which was at a high level (Mean = 4.00). When considering each item, it was found that the three items instructors perceived useful the most were providing the course content, communicating with the learners, and sending homework. These three items were at a high level. However, using LMS to test the learners was perceived at a moderate level; this item had the lowest mean score (Mean = 3.48).

Table 3: Mean and Standard Deviation of Perceived Usefulness of LMS

Perceived Usefulness of LMS	Mean	SD	Level	Order
1. communicating with the learners	4.27	.63	high	2
2. providing the course content	4.31	.56	high	1
3. testing the learners	3.48	1.08	moderate	5
4. checking the learners' participation	3.76	.67	high	4
5. sending homework	4.19	.57	high	3
Total	**4.00**	**.32**	**high**	

Research Question 2: Are there any differences in the instructors' attitude toward LMS between two groups: males and females?

An independent t-test analysis was employed to examine a significant difference between two groups of instructors in their attitude. The results revealed that there was no statistically significant difference in attitude between the two groups at the level of .05. This means that male and female instructors were not different in their attitude as demonstrated in Table 4. So, the hypothesis 1 stating that gender had an effect on attitude toward LMS was denied.

Table 4: A Comparison of Mean Scores of Attitude toward LMS Classified by Gender

Gender	n	Mean	S.D.	df	t	p
Male	26	4.23	.21	60	1.613	.112
Female	36	4.12	.28			

Research Question 3: Are there any differences in the instructors' attitude toward LMS between two groups: those teaching language courses and those teaching in other subject domains?

An independent t-test analysis was employed to examine a significant difference between two groups of subject domains comprising the instructors in the language teaching field and those in other fields. The results revealed that there was no statistically significant difference in attitude between the two groups at the level of .05. This means that instructors did not differ in their attitude as demonstrated in Table 5. So, the hypothesis 2 stating that subject domains had an effect on attitude toward LMS was denied.

Table 5: A Comparison of Mean Scores of Attitude toward LMS Classified by Subject Domains

Subject Domain	n	Mean	S.D.	df	t	p
Language Teaching	30	4.19	.21	60	.786	.435
Other Subject Domains	32	4.14	.29			

Research Question 4: Are there any relationships between the instructors' attitude toward LMS, perceived ease of use, perceived usefulness, and their actual use of LMS in current courses?

The primary purpose of this study was to examine the relationship among certain factors regarding LMS actual use. Several analyses were, therefore, conducted, and the findings revealed that the two factors namely perceived ease of use and perceived usefulness were related to attitude toward LMS. Attitude toward LMS was positively correlated with how much they perceived LMS easy to use ($r = .530$, $p < .01$) and how much they perceived LMS useful ($r = .300$, $p < .05$). That is, the more they perceived LMS easy to use and the more they perceived LMS useful, the more they had positive attitude toward LMS. Therefore, the hypothesis 3 and 4 were accepted.

The results also indicated that perceived ease of use was positively correlated with how much the instructors perceived LMS useful, $r = .457$, $p < .01$. This means the more they perceived LMS easy, the more they felt its usefulness. As such, the hypothesis 5 was accepted.

Out of 62 instructors surveyed, 41 have used an LMS while 21 have not engaged in using an LMS in their current course. An investigation was further undergone to see whether certain factors were related to the actual use of LMS. The results reveal that correlations were not found between the use of LMS in current courses and the three factors namely attitude toward LMS ($r = .131$, $p > .05$), perceived ease of use ($r = .099$, $p > .05$), and perceived usefulness ($r = .240$, $p > .05$). As a result, the hypothesis 6, 7, and 8 stating that attitude toward LMS, perceived usefulness and perceived ease of use were related to actual use were rejected.

Table 6: Intercorrelations among Variables

	Ease of Use	Usefulness	Actual Use
Attitude	.530**	.300*	.131
Ease of Use		.457**	.099
Usefulness			.240

*Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

PART III: RESPONSES FROM OPEN-ENDED QUESTIONS
Research Question 5: What are the difficulties faced by the instructors using LMS?

The first question asked the instructors to indicate any difficulties they were encountering when they used the system. Out of 41 instructors using LMS, the majority of them (n = 34) had no difficulty working with it. After the training, they were quite able to use the system. This may conclude that LMS was perceived by the majority of them as easy-to-use. However, seven of them identified some problems they were facing which comprised complicated functions of LMS, students' learning behavior and restriction of LMS use. First of all, four of them stated that the system is too difficult to operate. Low computer literacy might be the cause. They suggested that not only the instructors, but students also needed special training too. In addition, two instructors perceived that some students did not pay much attention to the downloaded materials in LMS; it was like a big burden for them. They were not responsible for the self-study that was assigned. The last issue which was raised by one instructor always using it in his class was limitation of LMS use. For instance, the discussion board was not convenient in case a lot of explanation was needed. However, despite all of these difficulties, they still used it.

Research Question 6: What are the main reasons why the instructors did not use LMS in their course and which technology they chose instead of LMS?

Based on the finding, 21 instructors replied that they did not use LMS. The second open-ended question asked these instructors the reasons why they did not use it in their course. The majority of them (n = 16) found LMS rather inconvenient when compared to other kinds of technological tools. For example, they preferred to use LINE, Facebook, blog and Twitter when they wanted to send homework, put up announcements, and communicate with students. Only four of them perceived complexity of the system, so they did not want to implement it in their course. Only one instructor did not see any benefits of using LMS in her course. This was not because the complexity of the system, but she preferred to have more face-to-face meeting than online communication in LMS.

DISCUSSION
The first discussion is about attitude toward LMS which was at a high level. One of the causes may have been from the potential of Moodle which can be effectively used for uploading materials and communication among

instructors and students. The replies from the open-ended question also supported that not many instructors encountered difficulties. Apart from that, there are many other elements which might affect their attitude such as subject contents, communication, and learning tasks. Although they did not have positive toward LMS, they needed a learning tool to help in the teaching process. For instructors who had no choice with other technologies, the use of LMS was an answer which enabled them to manage classes, making instruction easier.

The second discussion was on gender and teaching domain. Male and female instructors did not differ in their attitude toward LMS. Moreover, they had the same attitude no matter what subject they were teaching. A possible explanation for this result comes from the policy of the university that urged all faculty members to use technology in their courses. The use of computer technology as a tool for learning was fully supported by most of educational institutions, not only our university. The training may be helpful to make them know more about how to use the new system like LMS. The finding was in contrast to many studies (Anderson & Haddad, 2005; Dhindsa & Shahrizal-Emran, 2011; Li & Kirkup, 2007) which found that females demonstrated negative attitudes in using technology.

The next issue which should be discussed is about perceived ease of use which is found to have an influence on perceived usefulness. The finding was consistent with previous studies in that perceived ease of use had the strongest significant influence on perceived usefulness (Adwan et al., 2013; Shroff et al., 2011). We may conclude that comfort with LMS usage enables instructors to approach it. Then they perceive the benefits of it. The more they are comfortable with LINE, the more they perceive its usefulness. LMS is not a difficult tool after they are trained to use it. It is rather user-friendly. It allows users to put learning materials, chat or send messages whenever and wherever they are, so it can be applied to create interesting classroom activities. This result is supported by Jafari, McGee, and Carmean (2006) who state that LMS assists faculty in managing courses and organizing content to engage students and decrease planning time.

Another interesting finding revealed that perceived ease of LMS use and usefulness had a significant positive correlation with their attitude.This is probably because LMS are user-friendly technology. Only basic knowledge of technology is required. So, after instructors get training, they can make use of LMS in their course easily. Instructors find it convenient and accessible to learn materials anywhere and anytime. In the same vein, instructors recognize that LMS can facilitate language teaching and learning since they can upload the information about the course. LMS is one of the effective tools for communicating with students. Students' posting messages on discussion forum will be exposed to classmates. When they perceive it useful and easy to use, they feel positive about it. The current findings were found to be in accordance with those of the previous studies in that perceived ease of use had the strongest significant influence on attitude towards use (Chang et al., 2012; Park, 2009).

The last issue for discussion is on attitude toward LMS which was not correlated to actual use of LMS. The present finding was similar to that of Al-Senaidi, Lin, & Poirot, (2009). It is possible that users might use technology even if they did not have positive attitude toward it. This might be due to the fact that most of the courses were promoted to use technology tools to facilitate learning. Instructors have adapted themselves to the course redesign for quite some time. There are various tools they are using in their classes such as Facebook, Twitter, and LINE. So, even though they have positive attitude toward LMS, it doesn't mean they will adopt it in their classroom. The result was in accordance with the open-ended responses showing that instructors preferred to use other kinds of technology like LINE, Facebook, and Twitter in teaching and learning process. However, the current finding was found to be in contrast with many studies stating that attitude towards technology are key factors in the adoption and use of technology, specifically an LMS, by faculty (Lawler & King, 2003; Nasser, Cherif & Romanowski, 2011; Rogers, 1995).

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