

INSTRUCTOR'S PERSPECTIVES
ON THE CRITICAL SUCCESS FACTORS OF
LEARNING MANAGEMENT SYSTEM (LMS)
IMPLEMENTATION IN HIGHER LEARNING INSTITUTIONS

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ABSTRACT

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Tiew Shuet Ling

Learning Management Systems (LMS) collectively refers to systems that manage all activities that take place when learning is concerned. Many higher learning institutions around the globe are using LMS and the effect on student's learning process has been researched. This project is tasked to investigate from the instructors' perspectives, what are the critical success factors (CSF) on the implementation of LMS in Higher Learning Institutions. Data from 53 instructors who are currently teaching and using LMS in various higher learning institutions have been collected via questionnaires. The critical success factors of self-efficacy, attitude towards LMS, experience with the use of technology, teaching style and LMS features are studied alongside with its sub-factors. The study is analysed using statistical tools SPSS to review if these factors are related with and influencing in the implementation of LMS in higher learning institutions. Research results have showed that the factors are correlated to the implementation of LMS and also concluded that Self-Efficacy and LMS features are the predictor variables to the dependent variables. The result drawn from this project aimed to assist or guide management of the higher learning institution to look into the CSF when implementing LMS in the institution effectively.

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Date: 4/4/2014

PERMISSION SHEET

It is hereby certified that **Tiew Shuet Ling** (ID No: **10UEM02750**) has completed this final year project / ~~dissertation~~ / ~~thesis~~* entitled “INSTRUCTOR’S PERSPECTIVES ON THE CRITICAL SUCCESS FACTORS OF LEARNING MANAGEMENT SYSTEM (LMS) IMPLEMENTATION IN HIGHER LEARNING INSTITUTIONS” under the supervision of Ms. Hoo Meei Hao (Supervisor) from the Department of Internet Engineering and Computer Science, Faculty of Engineering and Science, and _____ - _____ (~~Co-Supervisor~~)* from the Department of _____ - _____, Faculty of Engineering and Science.

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Yours truly,

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This final year project entitled **“INSTRUCTOR’S PERSPECTIVES ON THE CRITICAL SUCCESS FACTORS OF LEARNING MANAGEMENT SYSTEM (LMS) IMPLEMENTATION IN HIGHER LEARNING INSTITUTIONS”** was prepared by TIEW SHUET LING and submitted as partial fulfilment of the requirements for the degree of Master of Information Systems at Universiti Tunku Abdul Rahman.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This research focuses on instructor's perspectives on the critical success factors of learning management system (LMS) implementation in higher learning institutions. Traditionally, one acquired knowledge from school where teachers were the assets that transform their knowledge to a student. Though this is still the fact for now but the direction has somewhat changes from one way to two way or even bidirectional as learning does not occurred only in a fixed location such as school or higher learning institution but it is almost everywhere. The mode of learning too has changed from chalk and board to e-learning or even mix-method of delivery. Students are demanding for more interesting manner of learning and teachers/lecturers or (instructor addressed in this study) need to change their role to be an active facilitator and also mediator between technology and students (Guzley, 2006). Learning Management Systems is a term widely adopted by educational institutions. As its term explains it is a system and manages learning and this system should be able to provide support to an instructor in the process of delivering knowledge to the students.

As much as the effect of educational institutions are finding ways to excite their students in learning, little effort is spend to ensure that instructors are equally important to be excite onto the new learning experience by ensuring different teaching pedagogy are used in line with the usage of systems.

In the following sections, related literatures and critical success factors influencing the implementation of the LMS in their learning environments are discussed. A quick review also made on the models to analysed LMS is successful and if it is being accepted by stakeholders in the implementation in an organisation. A research methodology and its design are based on the critical success factors from models prior to it is studied and examined. The research design has been completed in two

stages with pilot study followed by questionnaires. Data were collected from instructors who are teaching at various higher learning institutions. The data are then analysed using SPSS version 22. There are five (5) main hypotheses that have been hypothesized and testing will be done on this set of data that is collected. As a result of the pilot study, this research will also like to testify six (6) sub-hypotheses to testify the result from pilot study.

The answers to these hypotheses may be used by management of higher learning institution as a reference and guide as when management try to involve instructors in the LMS implementation; it will give a better overview of the instructors' need and will increase the overall teaching and learning experience.

1.1 Objective

The objective of this study is to investigate from the instructors' perspectives, what are the critical success factors on the implementation of LMS in the higher learning institutions. The outcome of this study can be used as a guideline for the management of any higher learning institutions to implement LMS effectively.

1.2 Scope of Work

This research project scope will cover private higher learning institutions in Malaysia and overseas. The participants of this research will be instructors who use Learning Management System (LMS) in their institutions. By snowball sampling, by the help of instructors who agreed to participate as respondents and that instructor to recruit additional instructors who are using LMS and are willing to participate in the questionnaires.

Collectively, LMS is a system that manages all activities that takes place when learning is concerned. Examples of LMS are Schoology, Moodle, Blackboard and etc. The term LMS used here is not used interchangeably with others terms commonly used in the teaching and learning such as Course Management Systems (CMS) and Content Learning Management System (CLMS) or even E-Learning.

In this research, the following assumptions have been made.

1. All independent variables (predictor variables) are not related and will be testing independently to testify if there are related to the dependent variables.
2. As resulted from the pilot study, LMS features were added into the proposed model. Thus, LMS features will only be tested as one of the hypothesis in the main-hypotheses testing and no sub-hypothesis testing will be considered.

1.4 Research Question

The research would like to answer this research question.

What are the critical success factors from instructors' perspectives that will contribute to the success of a LMS implementation in Higher Learning Institutions?

Often enough in the development and implementation of a system in organization, users are left out in the process which in turn create high failure rate in the system. Belassi 1996 said that a system that is successful for one may be a failure to another. As mentioned by Neal in his paper "*How Instructors Can Better Create a Sense of Community in Online Environments*", the instructor is the key to this planning and implementation. Prior studies has studied onto the critical success factors from the students' perspectives, the research now is focusing onto one of the stakeholders of the LMS which are instructors. Atan, et al. (2008) mentioned the roles of an instructor in LMS are mainly to

1. plan and create the course by uploading relevant teaching materials onto the course;
2. monitor and encourage students' participation via communication tools suggested;
3. assess and evaluate students' performance online via assessment tools provided.

1.5 Report Organisation

In the following sessions, Chapter Two reporting the literature reviews on Higher Learning Institutions and the usage of Learning Management Systems among instructors and related critical success factors. In this chapter, models related to LMS with the proposed research model are briefly discussed. In Chapter Three, the way how this research was conducted is detailed. Upon completion of the research data collection, the result is analysed and it is presented in Chapter Four. Then discussion of the result is made in Chapter Five. In Chapter Six, conclusion and further work of this research is presented.

CHAPTER TWO

LITERATURE REVIEW

2.0 Higher Learning Institutions

Higher Learning Institutions (HLI) is defined as an educational institution that legally authorized within a country to provide a program of education beyond secondary education to students. For example in Malaysia, the HLI is operating under the jurisdiction of the Ministry of Higher Education (MOHE). In one of the five core thrusts that the MOHE entrust on is to reinforce its management system. Strategies have been planned and designed to broaden the strength of the thrusts by improving the quality of teaching and learning and also enculturation of lifelong learning (Hussain, 2011).

Higher Learning Institutions (HLI) need to adapt to changes that are occurring and accept the fact that most learners are using technological devices in everyday life. On the other hand, the role of an instructor or lecturer has changed to be a facilitator. The learning environment is changing from static classroom to dynamic environment. Thus, HLI need to move on with the pace to adopt and adapt to a system that is able to provide the stated changes and culture. In a study conducted by the MOHE onto 26 Higher Education Institutions in Malaysia who have been using Learning Management System (LMS) reviewed that more than half is using Open Source Platforms LMS as opposed commercial LMS or customise developed. Most commonly used Open Source LMS is Moodle Embi [n.d.]. The concept of LMS has become ubiquitous as it is made possible through the use of Internet. LMS is also making use of mobile devices as a medium to support education and learning process (Cavus, 2011).

2.1 Learning Management System

Different terminologies have been used to describe systems being used in the HLI. Some papers referred Learning Management System (LMS) to other terms such as Course Management System (CMS) or Learning Content Management System (LCMS). Through this research, it was found that the functionality of the system determine its name and the nature of usage. In general, Course Management System is tools that instructors used to manage the courses alongside with the conduct of the classes (Watson, 2007). In a blended learning environment, the CMS will normally be used as instructors normally upload the materials onto the platform and will follow up with a discussion in class with students.

Kerschenbaum, [n.d] has mentioned in this White paper “*LMS Selection - Best Practices*” that Learning Content Management System (LCMS) software that enables authors to register, store, assemble, manage, and publish learning content for delivery via web, print, or CD. He outlines that the LCMS and LMS has different strengths and weaknesses but generally as far as learning is concerned, LCMS is used by the content creator or business owner who interact with the content for delivery while LMS is used students or instructors who interact with its front-end services available.

LMS is widely adopted by most higher learning institutions if not all of them. LMS can be used to deliver and administer content and resources to all students and employees in an organisation. Many LMS assists in course planning, distribution and evaluation of a specific learning process. There are two categories of LMS namely Open Source LMS or Proprietary LMS (commercial). Examples of LMS are Moodle, Sakai, Ilias and Jusun. Studies have shown that LMS provides advantages to any educational institution in general and instructors in specific (Al-Busaidi and Al-Shihi, 2010). Many universities or higher learning institutions are using different LMS to facilitate the learning process as students will be able to complete their studies in the convenient of the location (Almrashdeh et al., 2011). By using the traditional LMS, the process of customisation of assessment for different skills level of student is a challenging task thus in order to do this customisation, Akram et al. (2011) proposed an agents based architecture LMS. The proposed intelligent LMS comprised of

various agents (software modules) who one of it is the personalisation agent will be addressing learning materials that are suitable for different learners with different learning styles.

LMS also improve teaching and learning process as faculties and students are able to communicate more efficiently and course content is able to be assessed easily. Some of the basic functions of a LMS were defined (Henninger and Kutter, 2010) as follows:

- administration of learners, teachers/lecturers, courses and more
- communication tools
- presentation of learning content
- tools for building exercises
- assessment tools
- reporting tools

Although many colleges have started using LMS but many instructors will merely upload the required course materials to the course website. Instructors often do this process without much effort in exploring other features of the LMS. Research onto this area can be further explored in order to fully utilise interactive features (such as forum discussion and online grading or marking) for the benefit of the students.

In the following part of the paper, the critical success factors that promote a successful adoption and implementation of an LMS will be discussed. The paper will also look into the models that are related to LMS in its implementation.

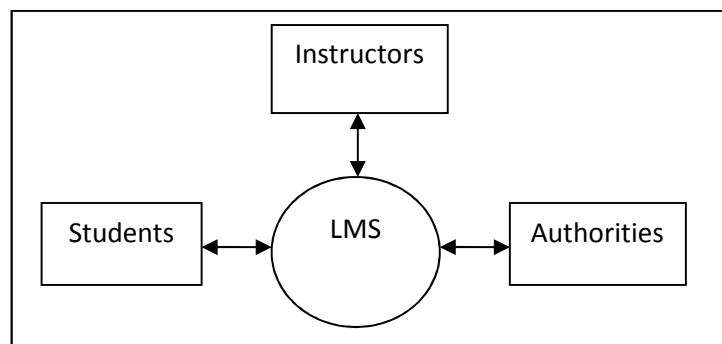


Figure 2.1: Stakeholders of a Learning Management System (LMS) in a Higher Learning Institution (HLI)

In the process of planning to the implementation of LMS in the HLI, various stakeholders are involved namely authorities (i.e. management, administrators), instructors and students (Ahmad et al., 2012).

In a traditional learning systems' development, students or even the instructors are not part of the team of development; the authority was the one that propose most of the features of the LMS (Ismail et al., 2011). In order to achieve success in this process, acceptance and involvement from all of these stakeholders is utmost important. This should be achieved through early involvement of all level of stakeholders from the initial stage of planning through the implementation stage. In one of the paper (Al-Busaidi and Al-Shihi, 2010), it stated that instructor's acceptance is essential for the deployment of LMS. When the instructors start accepting the LMS initiatives, it will initiates and promotes students' utilisation of LMS.

One may pose question on "How do you judge a person (instructor) is successful in delivering the content via LMS?". As mentioned by Wagner et al. (2008), the success of e-learning is dependent on the collaboration and cooperation of all stakeholders. For example, in a traditional classroom context, instructor will be delivering lectures and sharing content via conventional teaching methodology; in the e-learning or blended learning environment on other hand, instructor is now the manager of the content and students are responsible in their learning in their own pace. So, the usage of LMS is served as asynchronous tool for students. Having said that, in order to assess if learning of the content really taking place amongst students, instructor is responsible to give feedback and also give formative tests to evaluate the students' performance. Al-Busaidi (2011) has adopted and modified the perceived ease of use and perceived usefulness constructs from the LMS Acceptance Model to further evaluate if a person has successful in delivering content via LMS. Govindasamy (2002) commented that one of the most crucial prerequisites for successful implementation of e-Learning is the need for careful consideration of the underlying pedagogy, or how learning takes place online.

2.3 Critical Success Factor

Critical Success Factor (CSF) is described as crucial factor that is needed and focus onto in order to ensure the success of the system or project. CSF was coined by D. Ronald Daniel back in the 1960s. Organisations normally relate CSF to the mission and vision of the organisations as the successful identification of CSF will leads to a higher chances of project or system implementation. Very often, the term CSF is almost used interchangeably with the term key success factor. In a working paper of Grunert and Ellegaard (1992), critical success factors are the few key areas which must be right and it must go well in order for business to flourish and for the manager's goals to be attained. So it is important for organisation to consider the CSF in order to have a successful implementation of an IT/IS system.

In the context of e-learning, Chen et al. (2009) generalized from their research that instructor is not the only critical success factor but also a good and friendly website will be need to be effective in order to support of the e-learning environment. Selim (2007) mentioned that CSFs should be few in numbers, measurable and controllable. Although there is a large number of research articles on e-learning, few of them address the most important issue of e-learning critical success factors. All these literature reviews were based on the students' perspective but not on instructor perspective. Thus, this explains the purpose of this research that the instructor perspective too is important. This is supported by a study conducted with 295 respondents, Sun (2008) testified that instructor's attitude toward e-Learning positively influences perceived e-Learner satisfaction. Sun (2008) also mentioned that e-Learning course flexibility, e-Learning course quality, perceived usefulness, perceived ease of use, and diversity in assessment are the critical factors affecting learners' perceived satisfaction.

On another note, there are 13 critical success factors (CSF) related to the implementation from the perspective of instructors, technology and organisation mentioned by Al-Busaidi and Al-Shihi (2010) . In their paper it mentioned that self-efficacy, instructors' attitude, experience with the use of technology; instructor's

teaching style as well as personal innovativeness are some of the factors related to instructors' acceptance to the LMS implementation. Few studies have proved that instructors' attitude and characteristics towards the use of emerging educational LMS technology will directly affect the rate of technology use in classroom (Asiri et al. 2012). Lecturer factor is among the six CSF for an e-learning system that Fresen (2005) highlighted in their research. In a qualitative research done by Lubin et al. [n.d.], instructors revealed that individual's prior experiences pertaining to LMS determine their initial responses to the implementation.

A recent finding by Mardhiyah (2011), shown that people issue is the critical success factors to the IT/IS implementation. The review of 54 publications across different industries revealed there were 26 people-related CSF that relates to the implementation of an IT/IS in the organisation. In another study from Cabral et al. (2012) said that ICT-based training must be given to the instructors in order to prepare them to the adoption of a LMS for the teaching purpose in the HLI. The study concluded that instructors, faculties and researchers who have not attended any workshop or ICT-based training as a preparation to LMS implementation will not have any contribution or no output seen in the LMS system.

Table 2.1 listed the CSF contributing to the LMS implementation from different literature reviews. From the observation of this table, it is noted that users' experience or knowledge on the use of LMS is a "must have" CSF. Management support and technological support will help the instructors or users to quickly adapt and motivated them to use the LMS in the organisation (Gautreau, 2011).

2.4 Models Related to LMS

Based on previous literature reviews, there are few models related to the LMS. The usage of these models is use to assess if LMS is successful and if it is being accepted by stakeholders in the implementation in an organisation.

Teo et al. (2009) mentioned that the Technology Acceptance Model by Davis (1993) was designed to represents interaction among personal beliefs, attitudes, and intentions to use computer technologies. Literatures have shown that there are variations and extension made or append to this model in order to adopt it effectively into the organisation Legris et al. (2003).

Al-Busaidi and Al Shihi (2010) has adopted the Technology Acceptance Model and has added critical factors are related to the instructor, organization, and technology to this model. They proposed a theoretical framework based on Technology Acceptance Model (TAM) Figure 2.2 in the research paper for evaluating instructor's acceptance of LMS. This framework provides a comprehensive look of the critical factors encompassed instructors, organisation and technology factors, these factors influence the instructor's perceived ease of use and perceived usefulness of LMS and consequently the actual use. However, their research is based on the theoretical framework and they have recommended for future work to use empirical studies to verify the effects of these factors.

In this study, this model is adopted and empirical work will be done to check if the variables are related to the instructor acceptance of the LMS system that was implemented in the institution.

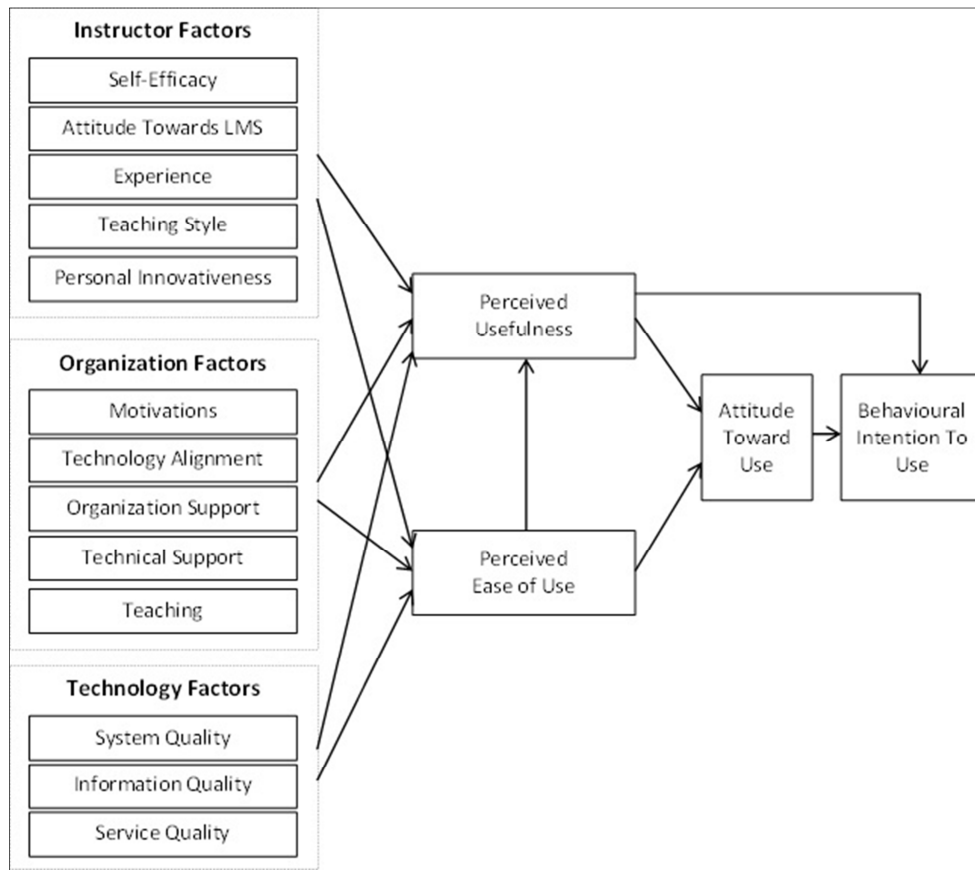


Figure 2.2: Proposed Instructor's LMS Acceptance Model
Source: Al-Busaidi and Al-Shihi (2010)

The study of Almrashdeh et al. (2011) aims to use the Educational Technology Model (ETM) to identify the factors that influence the success of LMS. The result of this study validate that ETM is a reliable tool to measure the success of LMS.

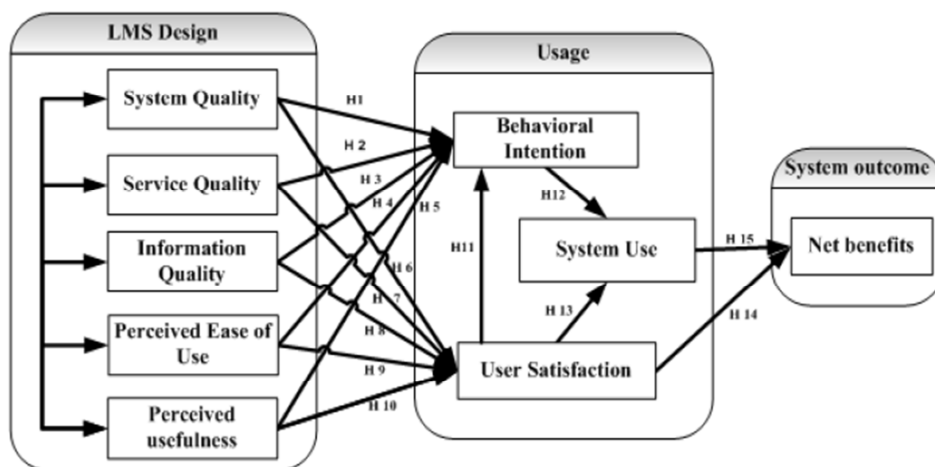


Figure 2.3: Educational Technology Model
Source: Almrashdeh I.A. et al. (2011)

In relation to the success model, DeLone and McLean’s IS success model is one of the most accepted frameworks (Song, 2011). In his research paper, Song has commented that institution should not simply applying the IS success model onto the LMS acceptance in the educational context. It has to take into consideration of the major group of user of the system i.e. instructors and students in order to realise the benefits.

The following figure 2.4 is the adapted LMS model based on the IS success model.

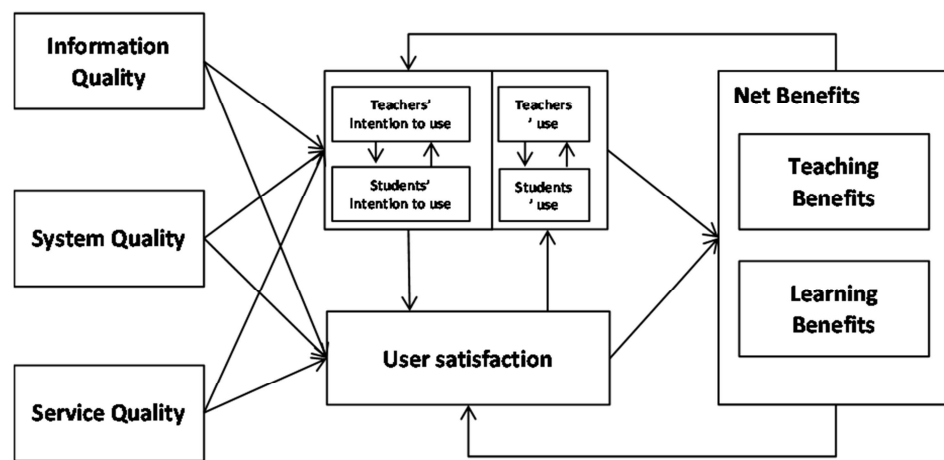


Figure 2.4: Adapted LMS Success Model
Source: Song X. (2011)

Table 2.1: List of Critical Success Factors Contributing to the LMS implementation

Sources	<i>Aziz, Nur Mardhiyah and Salleh, Hafez (2011)</i>	Al-busaidi, K.A. and Al-shihi, H. (2010)	Almrashdeh, I.A. et al. (2011)	Ismail, M.N., Yahya, Y. and Mukhtar, M. (2011)	Lubin, I.A., Xun Ge * [n.d.] , 2(4), pp.433–447.	Asiri, M.J. et al. (2012).
Title of Journal	<i>People CSF of IT/IS Implementation: Malaysian Perspectives</i>	<i>Instructors' Acceptance of Learning Management Systems : A Theoretical Framework.</i>	<i>Instructor's success measures of Learning Management System. Proceedings of the 2011 International Conference on Electrical Engineering and Informatics, (July), pp.1–7.</i>	<i>LMS Value Elements Identification: Using the Laddering Technique</i>	<i>An Investigation of Faculty ' s Perceptions and Experiences when Transitioning to a New Learning Management System</i>	<i>Factors Influencing the Use of Learning Management System in Saudi Arabian Higher Education: A Theoretical Framework.</i>
CSF	Motivation	Organisation Factor: Motivation				
	Training/ Skills	Organisation Factor: Training			Technological Experience <ul style="list-style-type: none"> • Prior experience • Interface experience • Visual organisation • Options vs. control 	External Variables: Training

Sources	<i>Aziz, Nur Mardhiyah and Salleh, Hafez (2011)</i>	Al-busaidi, K.A. and Al-shihi, H. (2010)	Almrashdeh, I.A. et al. (2011)	Ismail, M.N., Yahya, Y. and Mukhtar, M. (2011)	Lubin, I.A., Xun Ge * [n.d.], 2(4), pp.433–447.	Asiri, M.J. et al. (2012).
	Top management support	Organisation Factor: Organisation Support			Technological Support	
	Communication					
	Knowledge & Experience	Instructor Factor: Experience	LMS Design: <ul style="list-style-type: none"> • Perceived Ease of Use • Perceived Usefulness 	Easily adopted	Prior Experience	Internal Variables: Competence level in using technology
	Leadership/ IT Leader	Organisation Factor: Technology Alignment				
	Willingness to change					
	IT staff roles and responsibility	Organisation Factor: Technical Support				
	Organisational culture					External Variables: External Barriers - Organisational barriers

Sources	<i>Aziz, Nur Mardhiyah and Salleh, Hafez (2011)</i>	Al-busaidi, K.A. and Al-shihi, H. (2010)	Almrashdeh, I.A. et al. (2011)	Ismail, M.N., Yahya, Y. and Mukhtar, M. (2011)	Lubin, I.A., Xun Ge * [n.d.], 2(4), pp.433–447.	Asiri, M.J. et al. (2012).
	Commitment	Instructor Factor: Self-Efficacy				
	Management style	Instructor Factor: Teaching style			Pedagogical Support	Internal Variables: Pedagogical beliefs toward e-learning
	User involvement					External Variables: Gender
	Attitude	Instructor Factor: Attitude towards LMS				Internal Variables: Attitude towards use of technology
	Team work/ Collaboration					
	Interest in IT	Instructor Factor: Personal Innovativeness				External Variables: External Barriers - Technological barriers
	Employee behaviour towards collaborative environments					External Variables: External Barriers - Social barriers

Sources	<i>Aziz, Nur Mardhiyah and Salleh, Hafez (2011)</i>	Al-busaidi, K.A. and Al-shihi, H. (2010)	Almrashdeh, I.A. et al. (2011)	Ismail, M.N., Yahya, Y. and Mukhtar, M. (2011)	Lubin, I.A., Xun Ge * [n.d.], 2(4), pp.433–447.	Asiri, M.J. et al. (2012).
	Awareness					
	Focus & vision					
	Trust					
	Interpersonal relationship					
	Satisfaction	Technology Factor: Information Quality	LMS Design: Information Quality			
		Technology Factor: System Quality	LMS Design: System Quality			
		Technology Factor: Service Quality	LMS Design: Service Quality			
				Low management cost		
Methodology	Semi structured interviews	Theoretical framework based on Technology Acceptance Model	Questionnaires (Online) & E-survey	Interview - Means Ends Chain Theory & Laddering Technique	Interviews	Theoretical framework based on Technology Acceptance Model & Theory of Reasoned Action

2.5 Proposed Research Model

There are many critical success factors onto a system implementation were highlighted in the literature reviews. This study will focused on the main five factors namely *Self-Efficacy*, *Attitude towards LMS*, *Experience with the use of technology*, *Teaching Style*, *LMS Features* and the related sub-factors that will influence onto the implementation of an LMS in the higher learning institution. The main factors are adopted from (Al-Busaidi and Al-Shihi, 2010) and the sub-factors are deduced from various other literatures as listed in Table 2.2.

The following Figure 2.5 shows the proposed model depicts the main factors and sub-factors from the instructor perspectives that will affect the LMS implementation in Higher Learning Institution.

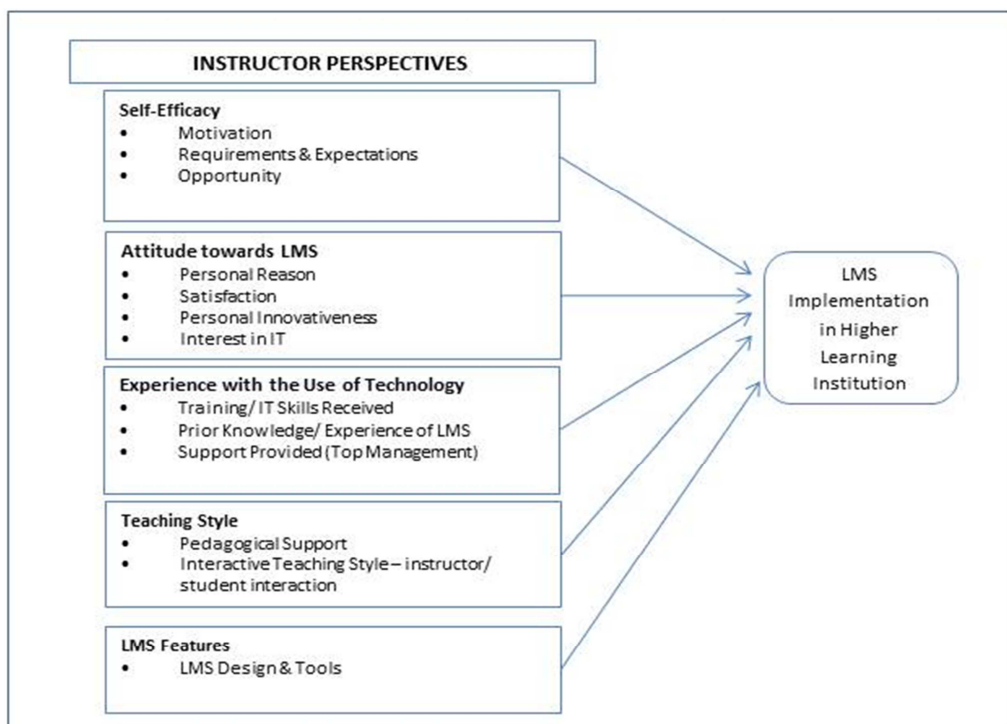


Figure 2.5 Proposed Research Model

Table 2.2: Identification of Critical Success Factors & Sub-Factors from the instructors' perspectives that will leads onto the success implementation of LMS in the higher learning institutions.

(The literatures related to these factors are tag alongside (at the right column) of its factors. The table also shows the Questions Number in relation to the Questionnaires.)

Main Factors	Literatures related to the Main Factors	Sub-Factors	Literatures related to the Sub-Factors	Questionnaires (See Appendix B – Questionnaires)
Self-Efficacy ¹	Al-Busaidi and Al-Shihi 2010. <i>Instructors' Acceptance of Learning Management Systems: A Theoretical Framework</i>	Motivation	Mardhiyah N. (2011)	1, 14
		Requirement & Expectations	Mardhiyah N. (2011)	5, 9
		Opportunity	Gautreau (2011)	3, 13
Attitude towards LMS		Personal Reason – Monetary, Promotion, Personal Advancement	Betts K. (1998)	4, 7
		Satisfaction	Betts K. (1998)	8, 11
		Personal Innovativeness	Al-Busaidi and Al-Shihi (2010)	19
		Interest in IT	Mardhiyah N. (2011)	20
Experience with the Use of Technology		Training/ IT Skills Received	Mardhiyah N. (2011)	2, 12
		Prior Knowledge/ Experience of LMS	Lubin, I.A., Xun Ge *. [n.d.] 2(4), pp.433–447.	22

¹ Oxford Dictionaries, 2013, the term efficacy means the ability to produce a desired or intended result.

Main Factors	Literatures related to the Main Factors	Sub-Factors	Literatures related to the Sub-Factors	Questionnaires (See Appendix B – Questionnaires)
		Support Provided (Top Management)	Al-Busaidi and Al-Shihi (2010)	6, 10
Teaching Style		Pedagogical Support	Asiri, M.J. et al. (2012)	15, 18
		Interactive Teaching Style – instructor/ student interaction	Lonn, S. and Teasley, S. (2009)	16, 17, 24
LMS Features		LMS Features & Tools	Almrashdeh, I.A. et al. (2011)	23, 26, 27
Dependent Variables				21, 25
LMS Implementation				

2.5.1 Self Efficacy

According to online definition found on Oxford Dictionaries (2013), the term efficacy means the ability to produce a desired or intended result. In this research the term “self” in the self-efficacy does mean the instructor’s ability to produce a desired or intended result that they desired in the context of education. Schulze (1986) in the article commenting that “Believing is Achieving: The Implications of Self-Efficacy...”, the article has highlighted that the judgments a person may make about his or her abilities can lead a person to decide which activities to try or not to try, how much effort to give, or how persistent he or she will be when challenged. Thus, if an instructor has set his/her aim to deliver the content asynchronously using LMS while lecturing in class; with high self-efficacy in him/her, the objective can be reached because he/she will strive hard to reach the goal despite of difficulties.

In a pilot study conducted with four instructors from a higher learning institution reviewed that usage of LMS allows students to learn at their own time and their own pace. The usefulness of LMS for students has motivated instructors to incorporate the technology in class. Instructors have further commented that whether or not it is a requirement by the department or if it is going to be an expectation by university to use the technology, all instructors will still incline of using it. The sub-factor **Motivation** is a factor that strongly determine if the LMS implementation in the institution going to be successful or not.

Respondent 1 (R1) has mentioned that: “... *self-motivation is very important...*”

The sub-factor **Opportunity** in using LMS for scholarly pursue and career exploration are neutrally affecting Respondent 2 (R2) as this factor relates to different portfolio of jobs (i.e. current portfolio of School Manager who managing the school general administrative tasks will not see the usage of LMS for scholarly pursue or exploration of career).

Henceforth, the main hypotheses will be tested in this study:

(Main)H1: Instructor's self-efficacy is related with the LMS implementation in higher learning institution.

Based on the pilot study result, this study also likes to test the following two sub-hypotheses:

(Sub)H1: Motivation is a stronger sub-factor than requirement & expectations from instructor perspectives in the LMS implementation in higher learning institution.

(Sub)H2: Opportunity is a sub-factor that neutrally affects the LMS implementation in the higher learning institution.

2.5.2 Attitude towards LMS

Instructors' personal attitude towards LMS is influenced positively by most of the listed sub-factors but most prominently instructors felt that the **overall job satisfactions** directly influence their usage of LMS in class. Betts (1998) in her studies reviewed that there are extrinsic factors such as monetary support, increase in salary, credit towards tenure and promotion and also release time are some of the motivating factors that some deans of the faculty perceive will move the faculty members into participation in distance education. However, from the findings these factors are not significant in affecting the faculty involvement in the distance education.

In the pilot study conducted, Respondent 2 (R2) commented that: *".... I wouldn't do it just for salary increase; I wouldn't do it because my department requires it. I would want to do it because it is relevant to the subject, important to the students, for self-satisfaction or professional development."*

Similar responses were expressed by Respondent 3 (R3) and Respondent 4 (R4) too. Thus, it is convinced to say that the factor of overall job satisfactions superseded instructors' **personal reason** of intentions such as monetary or salary increase or even teaching load reduction.

Personal innovativeness and **interest in IT** are two sub-factors that respondents have consensus between states of neutral to strongly agree. However, respondents expressed that issues such as not enough time to explore features of LMS as well as uploading materials onto the LMS are their challenges in using LMS. It is also mentioned by R2 that the pre-loaded materials by the partner universities (such as course materials that have been pre-loaded by Murdoch University in their LMS system) has put a limit on the instructors' innovativeness in using the LMS.

The following main hypotheses and one of the sub-hypotheses will be tested in this study:

(Main)H2: Instructor's attitude towards LMS is related with the LMS implementation in higher learning institution.

(Sub)H3: Personal reason is not a strong sub-factor that affects the LMS implementation in higher learning institution.

2.5.3 Experience with the Use of Technology

Mardhiyah (2011) revealed that organizations emphasized on training in order to familiarize their workers to the usage of a system before the system implementation. Although commonly in this technology era, some instructor's experience on LMS is gained through process of trial and error and self-learning. Lubin et al. [n.d.] mentioned that training sessions or any form of workshops as well as institutional support helped faculty to overcome their initial overwhelming feelings as faculty members will know that readily helps are available if they need it.

The pilot result supported the literatures:

Respondent 1 (R1) said: “...for me personally, I prefer self-learning method... generally, some section of the teaching staffs might prefer – at least as an initiations into the LMS...” .

Respondent 3 (R3) reviewed that LMS is “... pretty user friendly, easy to understand and use, there is support group... that is why we are still able to use it without formal training...”

Respondent 4 (R4) commented that: “... half of our life is digital, -- notifications, Facebook, Social Networking, Twitter... I believe that we are able to catch up with any LMSes... required very little training....”

Although it is important to have LMS training for some, but the lack of this sub-factor does not affect instructors’ decision on their usage of LMS as instructors will still experience the use of LMS through other methods. It is also evident that respondents agree on their prior knowledge or experiences of LMS as well as the support provided by the top management are factors that will influence the success implementation of LMS in their classes.

Thus the main hypotheses H3 will be tested,

(Main) H3: Instructor’s experience with the use of technology is related with the LMS implementation in higher learning institution.

It is reviewed in the literatures presented in the preliminary research Cabral et al. (2012) said that ICT-based training must be given to the instructors in order to prepare them to the adoption of a LMS for the teaching purpose in the HLI. From the pre interview checklists, some respondents strongly agreed that related training is a factor influencing the instructors’ usage of LMS. However, from the interview sessions, all respondents reviewed that instructors will still be using the LMS whether or not there is training provided.

Result from the pilot study was not consistent, thus it has suggested for the following sub-hypotheses to be testify in this study:

(Sub) H4: Training received by instructors does not have relationship with the instructors' decision in the usage of LMS in higher learning institution.

(Sub) H5: Prior knowledge or experiences of LMS will influence the success implementation of LMS in higher learning institution.

(Sub) H6: Support provided by the top management is related with the success implementation of LMS in higher learning institution

2.5.4 Teaching Style

According to studies of Govindasamy (2002), it was mentioned that any implementation of e-learning system and LMS should integrate the pedagogical principles in it. The failure of consider the pedagogical principles will draw instructors away from the usage of the system. From the interview, respondents have said that LMS encouraged different teaching styles compared to the traditional mode.

Respondent 3 (R3) mentioned that “...*LMS give them some variation instead of just lectures... from the links that I put on the LMS, they can go and explore and look at it two, three times before lectures...*”. This proof that LMS does leads students to be more self-directed in their studies and to be more responsible.

Respondent 4 (R4) commented that “ ... *one quiz is entirely true or false and multiple choice, the system automatically give the marks ... I got over 90% doing it of a group of 47, it was good!*”

This conversation shows that LMS that are **pedagogical support** does increase the likelihood of instructors using it. In line with this, the hypotheses will be tested.

(Main) H4: Instructor's teaching style is related with the LMS implementation in higher learning institution.

Three out of four respondents have strongly agreed that the use of LMS to share teaching and learning of resources with students has encouraged them to use LMS better. All respondents agreed that LMS encouraging communications with students' outside classroom via the communications tools such as comments, posts, chats and discussions. This sort of communications does influence the **instructors and students interaction** in the process of learning. However,

Respondent 1 (R1) felt that: "... *there are a lot of irrelevant stuff being discussed or communicated... students gets diverted to something else...*".

Respondent 2 (R2) commented with a neutral state saying that: "... *there are still some lecturers who are not comfortable with the communication tools yet...*".

2.5.5 LMS Features

Result from the pilot study recommended that LMS features to be included as a critical success factor in the LMS implementation in the higher learning institution. LMS basic functions that are available are administration tools, communication tools, presentation of learning content, tools for building exercises, assessment tools and also reporting tools. Henninger and Kutter (2010). Coates et al. (2005) suggested that the incorporation of LMS into university teaching programmes leads to new kinds of organisation in the development of learning resources and the management of learning. If LMS has offered features that are suitable for the course and instructors are using it to deliver the content to the students, then a positive learning experience will be encountered by the students. In the pilot study conducted, Respondent 4 suggested that factor of LMS features (quizzes, ability to submit online, marking online assignment or others) are factors influencing instructor's acceptance of LMS in classes. Thus, in this study the main hypotheses H5 will be tested.

(Main) H5: LMS features are related with the LMS implementation in higher learning institution.

As a summary, there are five (5) main hypotheses and six (6) sub-hypotheses will be testifying in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Research Methodology

From previous literatures, there were three major research methodologies that researchers used to evaluate the usage of LMS, namely interview, evaluate research model and also questionnaires. Mardhiyah (2011) has applied semi-structured interview method in the study to review the reality of current situation and also commented that qualitative methodology such as interview is able to capture data in terms of perception and experience that cannot be captured through quantitative methodology. However, the findings obtained were not statistically tested and were confirmed by the author. Lubin et al. [n.d.] findings too were generated from qualitative research but with limitation of small number of interview participants will probably generate an answer of findings that are heavily dependent on an individual and will also easily be influenced by the researcher's personal bias Anderson (2010).

Both studies from Asiri (2012) and Al-Busaidi (2010) presented the theoretical framework underlying for evaluating factors that influence the utilization of LMS and instructors' acceptance of LMS based on the Technology Acceptance Model. By the framework approach, researchers were ensuring that organizations are deploying LMS but researchers suggested that empirical studies are needed to verify the effect of the factors. Asiri (2012) and Al-Busaidi (2010) suggested quantitative research are to be used to validate the model.

On the other hand, majority of the researchers used quantitative approach such as questionnaires and survey to obtain result on this area of study. Chen (2009) investigated 46 students' opinion on critical success factors of e-learning using questionnaires. Selim (2005) surveyed 538 students with an aim to specify e-learning critical success factors (CSFs) as perceived by university students. Sun (2008) conducted a series of in-depth interviews with various experienced e-Learning

learners to examine the validity of the research model. After which, questionnaire items based on the previous literature and comments gathered from the interviews and subsequently SPSS is used to analyse data for that research.

Quantitative methodology was chosen in this research because:-

- The studies of LMS implementation in higher learning institutions have been done in other higher learning institutions and it is a known phenomenon that there are many factors that commonly affect the implementation. By using a quantitative approach in this study will be able to test and validate the already constructed theories.
- It is important to draw conclusions from the findings for the benefit of the educational organizations. Through a quantitative approach, it can generalize research findings when the data are based on random samples of sufficient size by using data analysis tools.
- As an instructor personally, the usage of interviews as an instrument will create biases. Thus, the usage of questionnaires and its research results are relatively independent of the researcher.
- Data that is produced through a quantitative approach is precise, quantitative, numerical data.
- It is regret to mention that time is limited in this research and the research has to span across other higher learning institutions, the quantitative approach will be more feasible as compared to a qualitative approach as data collection using some quantitative methods is relatively quicker.

3.1 Research Design

For this study, there are primarily two stages to it. In the initial stage, it was decided that an interview approach will be used to gather the insights perspectives from instructor on the critical success factor of LMS implementation. Thus, A Pre-Interview Checklist is prepared stating the title of the assignment, objective of this study and the intention of interview. There are four (4) respondents are identified for the purpose of this assignment (*See Appendix A - Profile of Potential Respondents (Interviewee) in Pilot Study*). After seeking respondents' approval and agreement to do the interview session via email, (it is informed in the email that the interview session will be recorded for transcription purposes) a convenient interview session were scheduled and hand out/ email the Pre Interview Checklist to respondent for their quick review before the interview. Prior to the interview session, the checklist is collected and analysed by the interviewer. The process is concluded with data transcription and review as well as report writing. However, the opinions received from four respondents were limited in size and also it was not statistically proven to be valid and the findings cannot be generalized. Moreover, the respondents' opinion gathered were result from the same institution namely KDU University College.

3.1.1 Measurement Design & Participants

Thus, this leads onto stage 2 of the research which is quantitative approach – questionnaires is used. Questionnaires items were revised as from the pilot study, it was noted some of the items are not well structured. A 5-point Likert scales ranging from 1 as strongly disagree to 5 as strongly agree is used for the measurement. P value of 5% is use in the data analysis and the reporting, which 5% is the threshold if one should reject the neutral hypothesis and accepts the test hypothesis as valid.

A total of 53 responses of instructors who uses LMS from 11 different private higher learning institutions from Malaysia and overseas were collected for this study (Table 4.3(e)). The respondents were recruited by a form of snowball sampling with the help of instructors who agreed to participate as respondents and that instructor to recruit additional instructors who are using LMS and are willing to participate.

3.2 Research Framework

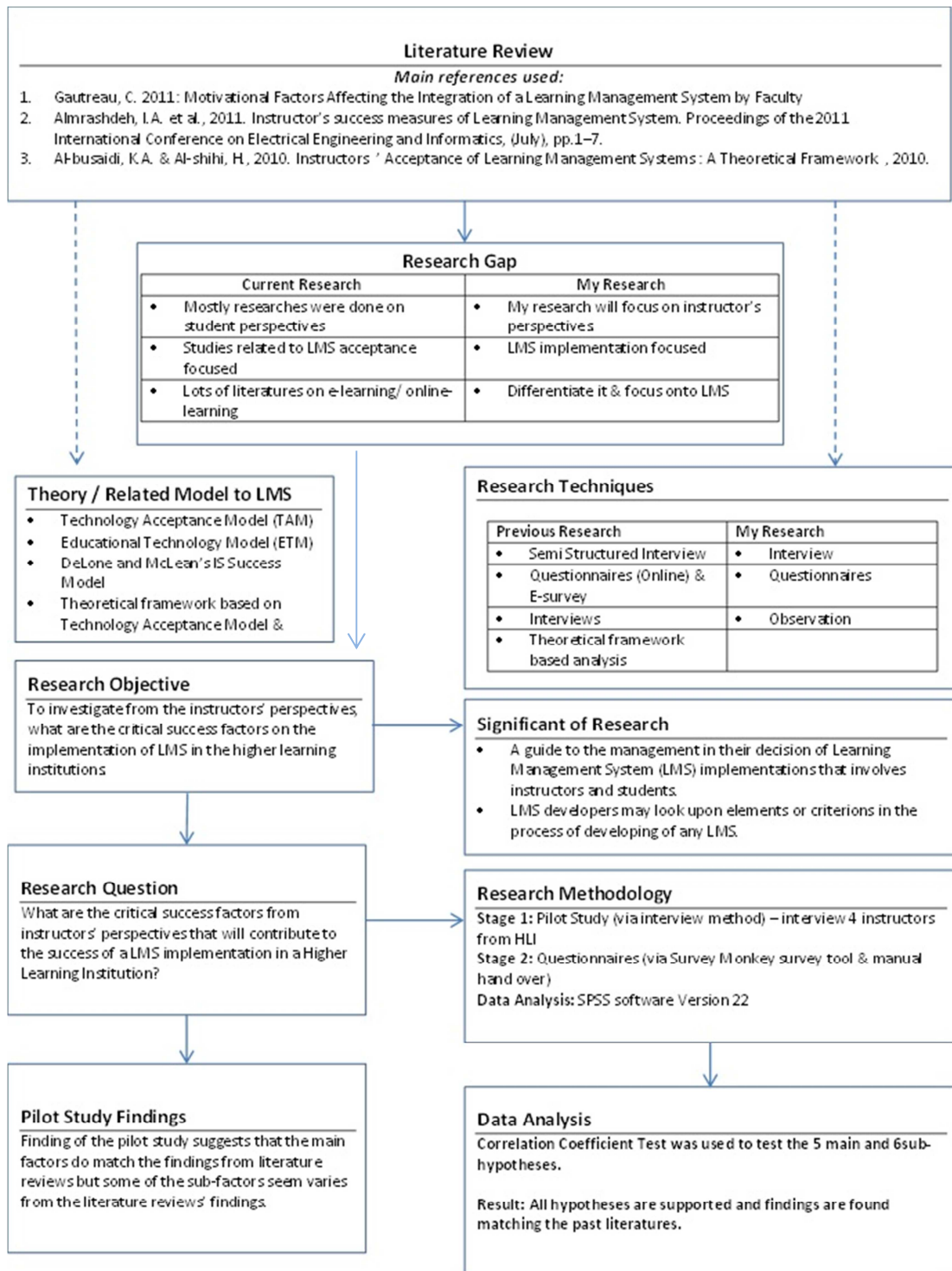


Figure 3.1: Research Framework

CHAPTER FOUR

RESULT ANALYSIS

4.0 Result Analysis

53 respondents have answered the questionnaires and this section will present the findings as the following sequence: demographic information and testing of the main hypotheses followed by the sub-hypotheses data analysis.

4.1 Demographic Information

Table 4.1 below show that there were 53 cases or respondents have contributed to the collection of data. The process of data cleaning has been done before analysis begin. There were 25 female respondents while 28 male respondents. Majority (66%) of the respondents are in the age group 30-39 years old. Respondents teaching experience with 0-5 years accounted for 54.7%, 6-10 years accounted for 34% while 11 years and above is 7.5% of the respondents' population.

In analysing years of LMS use, from the histogram it is seen that the respondents' year of LMS use is normally distributed with 28.8% each for 1-3 years and 3-6 years of LMS use while 21.2% each for less than 1 year and 7 years and above of LMS use.

Table 4.1 Respondents' demographic information

Table 4.1(a): Respondent's gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	25	47.2	47.2	47.2
	Male	28	52.8	52.8	100.0
	Total	53	100.0	100.0	

Table 4.1(b): Respondent's age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-29	3	5.7	5.7	5.7
	30-39	35	66.0	66.0	71.7
	40-49	7	13.2	13.2	84.9
	50-59	4	7.5	7.5	92.5
	60 or older	4	7.5	7.5	100.0
	Total	53	100.0	100.0	

Table 4.1(c): Respondent's Year of Teaching Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	29	54.7	56.9	56.9
	6-10 years	18	34.0	35.3	92.2
	11 years and above	4	7.5	7.8	100.0
	Total	51	96.2	100.0	
Missing	99.00	2	3.8		
Total		53	100.0		

Table 4.1(d): Respondents' Years of using LMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	11	20.8	21.2	21.2
	1-3 years	15	28.3	28.8	50.0
	4-6 years	15	28.3	28.8	78.8
	7 years or more	11	20.8	21.2	100.0
	Total	52	98.1	100.0	
Missing	System	1	1.9		
Total		53	100.0		

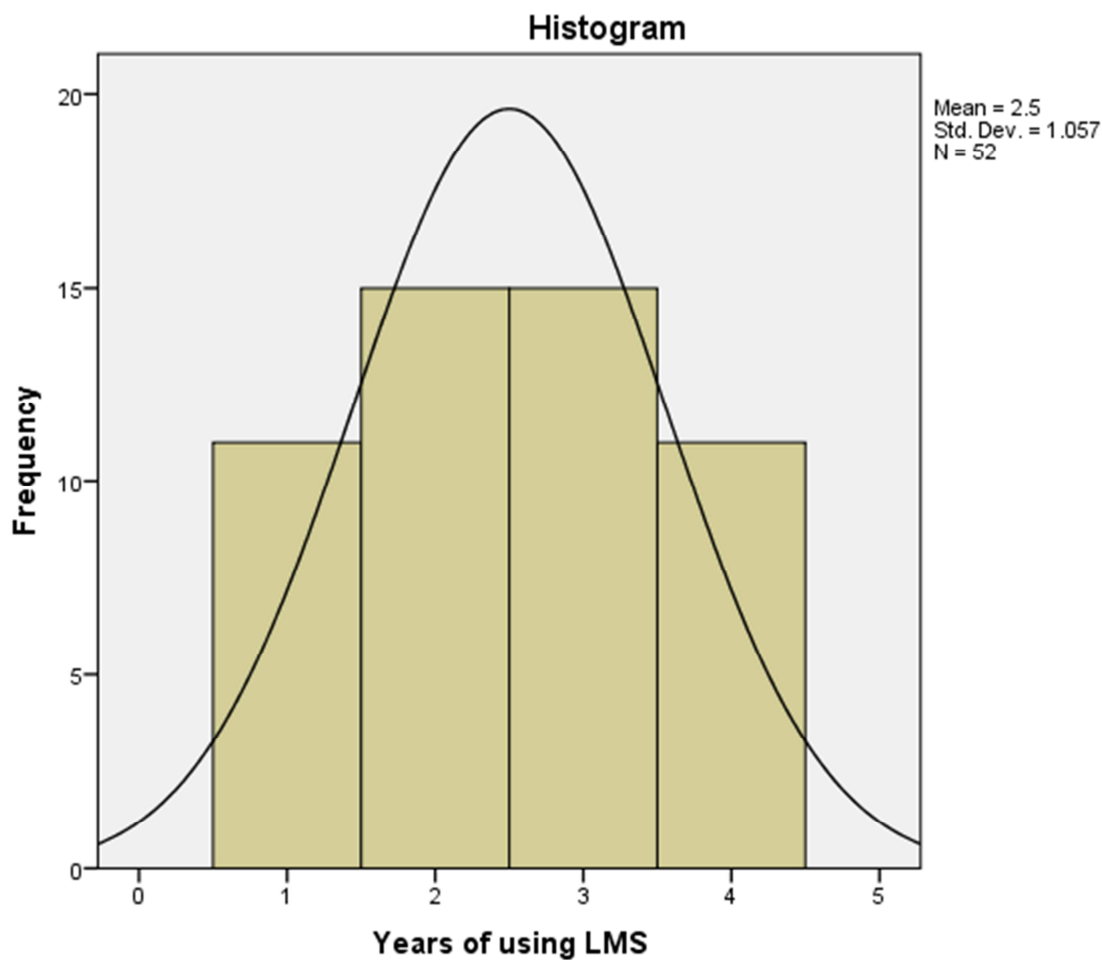


Figure 4.1: Histogram shows the distribution of years of using LMS among respondents

Table 4.1(e): Number of Respondents from Each Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HLI (1)	4	7.5	7.5	7.5
	HLI (2)	4	7.5	7.5	15.1
	HLI (3)	10	18.9	18.9	34.0
	HLI (4)	1	1.9	1.9	35.8
	HLI (5)	1	1.9	1.9	37.7
	HLI (6)	7	13.2	13.2	50.9
	HLI (7)	5	9.4	9.4	60.4
	HLI (8)	1	1.9	1.9	62.3
	HLI (9)	3	5.7	5.7	67.9
	HLI (10)	1	1.9	1.9	69.8
	HLI (11)	16	30.2	30.2	100.0
Total		53	100.0	100.0	

4.2 Reliability and validity analysis

Each independent variable is measured by at least one item in the questionnaires. An average is calculated if the construct is measure by more than one item.

The reliability of the dependent variables and its independent variables was checked and its Cronbach alpha value yield $\alpha = .877$, $N=6$. As seen in the Table 4.2(b): Item-Total Statistics, the variables are reliable and no variables were in need of deletion.

The items used in testing the independent variable and dependent variables are testing for its reliability. All items that were testing the 6 variables individually shown reliability Cronbach $\alpha > .7$ with exception to two variable, self-efficacy and LMS features with $\alpha = .51$ and $\alpha = .667$.

For self-efficacy variable, a closer examination of the questionnaire item-total statistics indicated that the alpha would increase to .62 if item Q9.5 is removed. This item asked whether participants “usage of LMS is a requirement KPI or KRA set by the department”, due to probably ambiguous setting of the item and/ or the participant’s organization do not practice Key Performance Index (KPI) or Key Result Area (KRA) setting on this area; the data responses for this item did not jell with other items and hence yielded low reliability. Consequently, this item was dropped from the questionnaire, and all subsequent analyses on this variable are based on participant’s responses to the remaining five (5) items.

For LMS features, variable, a closer examination of the questionnaire item-total statistics indicated that the alpha would increase to .750 if item Q9.27 is removed. This item asked whether participants “I prefer to use the current LMS (its design, tools) as compare to the previous LMS.” Probably due to situation where some participants do not have previous LMS use or experience, this item was not able to extract the relevant responses. Consequently, this item was dropped from the questionnaire, and all subsequent analyses are based on participant’s responses to the remaining two (2) items.

Table 4.2 Reliability test among dependent variables and independent variable

Table 4.2(a): Reliability Statistics

Cronbach's Alpha	N of Items
.877	6

Table 4.2(b): 'Item-Total Statistics'

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
LMS Implementations (D.V)	18.4648	6.201	.759	.845
Attitude towards LMS	18.5434	7.711	.619	.866
Self -Efficacy	18.7874	7.563	.755	.849
Experience with the Use of Technology	18.3799	7.495	.684	.856
Teaching Style	18.5044	7.374	.727	.850
LMS Features	18.4648	6.596	.651	.867

4.3 Main Hypotheses Testing

Spearman's rho was used to test the main hypotheses. There are one main dependent variables, LMS implementation while 5 independent variables namely Self-Efficacy, Attitude towards LMS, Experience with the use of technology, Teaching Style and LMS Features.

We hypothesized that all the independent variables are related with the LMS implementation in higher learning institution. The main hypotheses are as follows:-

(Main) H1: Instructor's self-efficacy is related with the LMS implementation in higher learning institution.

(Main) H2: Instructor's attitude towards LMS is related with the LMS implementation in higher learning institution.

(Main) H3: Instructor's experience with the use of technology is related with the LMS implementation in higher learning institution.

(Main) H4: Instructor's teaching style is related with the LMS implementation in higher learning institution.

(Main) H5: LMS features are related with the LMS implementation in higher learning institution.

Table 4.3: Correlations between independent variables and its dependent variables

			Correlations					
			LMS Implementations	Self-Efficacy	Attitude towards LMS	Experience with the Use of Technology	Teaching Style	LMS Features
Spearman's rho	LMS Implementations	Correlation Coefficient	1.000	.623**	.484**	.603**	.548**	.600**
		Sig. (2-tailed)		.000	.000	.000	.000	.000
		N		53	53	53	53	53
	Self-Efficacy	Correlation Coefficient		1.000	.498**	.640**	.592**	.520**
		Sig. (2-tailed)			.000	.000	.000	.000
		N			53	53	53	53
	Attitude towards LMS	Correlation Coefficient			1.000	.607**	.552**	.323*
		Sig. (2-tailed)				.000	.000	.018
		N				53	53	53
	Experience with the Use of Technology	Correlation Coefficient				1.000	.506**	.404**
		Sig. (2-tailed)					.000	.003
		N					53	53
	Teaching Style	Correlation Coefficient					1.000	.520**
		Sig. (2-tailed)						.000
		N						53
	LMS Features	Correlation Coefficient						1.000
		Sig. (2-tailed)						
		N						

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

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

Testing of Main Hypotheses

In the main hypotheses H1, we hypothesized that instructor's self-efficacy is related with the LMS implementation in higher learning institution. Result showed by Spearman's rho indicated that the presence of a strong positive correlation between instructor's self-efficacy and the implementation of LMS, $r_s = .623$, $p = .000$, two tailed, $N=53$.

In the main hypotheses H2, we hypothesized that instructor's attitude towards LMS is related with the LMS implementation in higher learning institution. Result showed by Spearman's rho indicated that the presence of a moderate correlation between instructor's attitude towards LMS and the implementation of LMS, $r_s = .484$, $p = .000$, two tailed, $N=53$.

In the main hypotheses H3, we hypothesized that instructor's experience with the use of technology is related with the LMS implementation in higher learning institution. Result showed by Spearman's rho indicated that the presence of a strong correlation between instructor's experience with the use of technology and the implementation of LMS, $r_s = .603$, $p = .000$, two tailed, $N=53$.

In the main hypotheses H4, we hypothesized that instructor's teaching style is related with the LMS implementation in higher learning institution. Result showed by Spearman's rho indicated that the presence of a moderate correlation between instructor's teaching style and the implementation of LMS, $r_s = .548$, $p = .000$, two tailed, $N=53$.

In the main hypotheses H5, we hypothesized LMS features are related with the LMS implementation in higher learning institution. Result showed by Spearman's rho indicated that the presence of a moderate correlation between LMS features and the implementation of LMS, $r_s = .600$, $p = .000$, two tailed, $N=53$.

Table 4.4: Multiple Regression Models

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.674 ^a	.454	.444	.62318	.454	42.476	1	51	.000
2	.751 ^b	.564	.547	.56250	.110	12.597	1	50	.001

- a. Predictors: (Constant), LMS Features
- b. Predictors: (Constant), LMS Features, Self-Efficacy
- c. Dependent Variable: LMS Implementations

Table 4.5: Unstandardized and Standardized Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	1.209	.401		3.013	.004	.403	2.015		
LMS Features	.679	.104	.674	6.517	.000	.470	.888	1.000	1.000
2 (Constant)	-.104	.518		-.202	.841	-1.144	.936		
LMS Features	.457	.113	.454	4.049	.000	.230	.684	.694	1.442
Self-Efficacy	.624	.176	.398	3.549	.001	.271	.977	.694	1.442

- a. Dependent Variable: LMS Implementations

After knowing that the main factors are correlated, multiple regressions will be used to know how the score on one variable will be useful for researchers to predict the score on the other variable. To test the hypothesis that main factors can account for a significant proportion of variance in the LMS implementation, the stepwise multiple regression analysis (MRA) was employed. Before interpreting the results of MRA, a number of assumptions were tested, and checks were performed.

First, stem-and leaf plots and boxplots. Although the box-plot is not perfectly symmetric, there is no clear violation of normality. This indicated that each variable in the regression was normally distributed and free from univariate outliers.

Second, an inspection of the normal probability plot of standardized residuals and the scatterplot of standardized residuals against standardized predicted values indicated that assumptions of normality, linearity and homoscedasticity of residuals were met.

Third, Mahalanobis distance did not exceed the critical χ^2 for $df = 2$ (At $\alpha = .001$) of 13.82 for any cases in the data file, indicating that multivariate outliers were not of concern. Finally, moderately high tolerances for all two predictors in the final regression model indicated that the multicollinearity would not interfere with our ability to interpret the outcome of the multiple regressions.

A stepwise multiple regressions were conducted to evaluate whether the main critical success factors were necessary to predict a success implementation of LMS.

In the analysis, the Self Efficacy and LMS features were entered into the regression equation were found significantly related to the LMS implementation, Adjusted R square = .547, $F(1, 50) = 12.597$, $p = .001$. The final model emerged from the Stepwise analysis contains only two predictor variables. The predictor variables are LMS features and Self-Efficacy. The other predictor variables such as Attitude towards LMS, Teaching Styles and Experiment with the use of technology were removed. The slope coefficients was .624 for self-efficacy while .457 for LMS features, indicating 54.7% of the variations in the LMS implementation could be explained by the Self Efficacy and LMS features while 45.3% variation is unexplained. This means that there are other predictors that are influencing the LMS implementation.

Thus the regression equation for predicting the success of LMS implementation was:

$$\text{LMS implementation} = -.104 + .457 * \text{LMS Features} + .624 * \text{Self-Efficacy}$$

4.4 Sub-Hypotheses Testing

A review of the list of sub-hypotheses that has been hypothesized as a result from the pilot study is as follows:-

(Sub) H1: Motivation is a stronger sub-factor than requirement & expectations from instructor perspectives in the LMS implementation in higher learning institution.

(Sub) H2: Opportunity is a sub-factor that neutrally affects the LMS implementation in the higher learning institution.

(Sub) H3: Personal reason is not a strong sub-factor that affects the LMS implementation in higher learning institution.

(Sub) H4: Training received by instructors does not have relationship with the instructors' decision in the usage of LMS in higher learning institution.

(Sub) H5: Prior knowledge or experiences of LMS is related with implementation of LMS in higher learning institution.

(Sub) H6: Support provided by the top management is related with the success implementation of LMS in higher learning institution.

In testing the sub-hypothesis H1: Motivation is a stronger sub-factor than requirement & expectations from instructor perspectives in the LMS implementation in higher learning institution. A correlation analysis was done to see to compare if motivation is correlate stronger than requirement & expectations in relation to the LMS implementation.

Table 4.6: Correlation between two sub-factors (Motivation & Requirement & Expectation) and the implementation of LMS

			Correlations				
			Self - Efficacy - Motivation	LMS Implementations	Self Efficacy - Requirement & Expectation		
Spearman's rho	Self -Efficacy - Motivation	Correlation	1.000	.710**	.237		
		Coefficient					
		Sig. (2-tailed)				.000	.088
		N				53	53
LMS Implementations		Correlation		1.000	.058		
		Coefficient					
		Sig. (2-tailed)				.683	
		N				53	
Self Efficacy - Requirement & Expectation		Correlation			1.000		
		Coefficient					
		Sig. (2-tailed)					
		N					

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

Spearman's rho indicated the presence of a strong positive correlation between instructor's motivation and the implementation of LMS, $r_s = .710$, $p = 0.00$, two tailed, $N=53$ than requirement and expectation with implementation of LMS yield $r_s = .237$, $p=.088$, two tailed, $N=53$. The self-efficacy is weak in relationship with LMS implementation but significant at .1 but not at .05.

In testing the sub-hypothesis H2: Opportunity is a sub-factor that neutrally affects the LMS implementation in the higher learning institution. A one sample *T* test was used to test the sub factor Opportunity of a sample of 53 instructors ($M = 3.1226$, $SD = .67870$) with neutral score of 3.

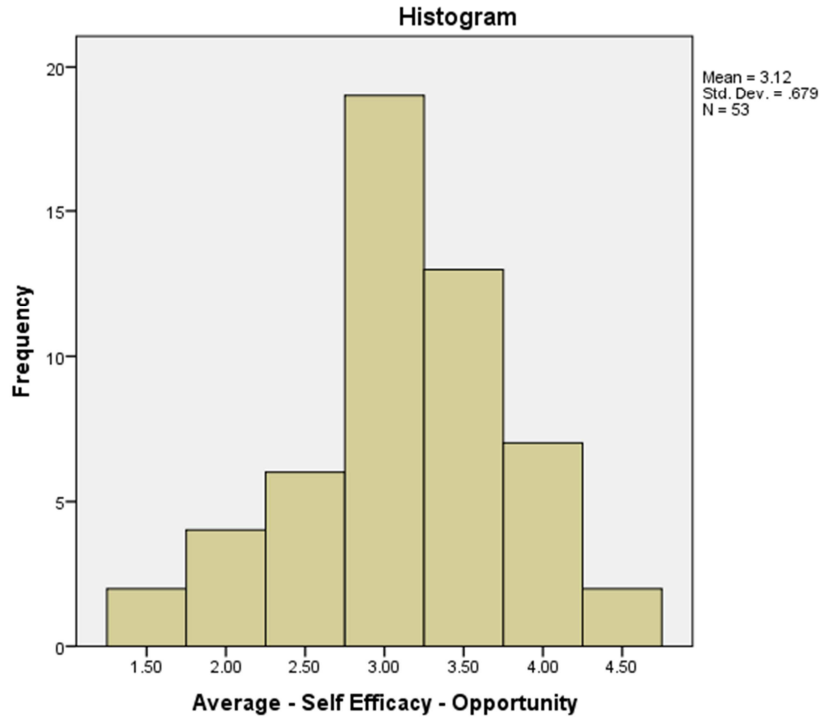


Figure 4.2: Histogram shows an approximately normal distribution of sub-factor Self Efficacy-Opportunity

Table 4.7: Inference Analysis using One Sample T-Test

Table 4.7(a): One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Self Efficacy - Opportunity	53	3.1226	.67870	.09323

Table 4.7(b): One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Self Efficacy – Opportunity	1.316	52	.194	.12264	-.0644	.3097

H_0 : Opportunity is a sub-factor that neutrally affects the LMS implementation in the higher learning institution.

From the histogram indicated that data was drawn from an approximately normal sample and the assumption of normality was not violated and the t -test was statistically non-significant, $t(52) = 1.316$, $p = .194$, $d = 0.18$, 95% $CI [-0.064, .30]$.

The t test reporting that result was statistically not significant; therefore, null hypothesis cannot be rejected and this data suggested that opportunity is a sub factor that is neutrally affects the LMS implementation in higher learning institution.

In testing sub-hypothesis, H3, personal reason is not a strong sub-factor that affects the LMS implementation in higher learning institution. A correlation coefficient analysis was conducted as follows.

Table 4.8: Correlation coefficient between instructor's personal reason and the implementation of LMS

			Correlations	
			LMS Implementations	Attitude towards LMS- Personal Reason
Spearman's rho	LMS Implementations	Correlation Coefficient	1.000	.122
		Sig. (2-tailed)		.385
		N		53
	Attitude towards LMS- Personal Reason	Correlation Coefficient		1.000
		Sig. (2-tailed)		.
		N		

It was hypothesized that personal reason (a sub factor of instructor's attitude towards LMS) is not a strong sub-factor that affects the LMS implementation in higher learning institution. To test this hypothesis a correlation test was conducted. Results suggested by Spearman's rho indicated the presence of a weak correlation between instructor's attitude towards LMS - personal reason and the implementation of LMS, $r_s = .122$, $p = .385$, two tailed, $N=53$. The correlation between personal reasons – a sub factor of instructor's attitude towards LMS and its implementation was not significant in this sample.

In testing sub-hypothesis, H4, training received by instructors does not have relationship with the instructors' decision in the usage of LMS in higher learning institution. To test this hypothesis a correlation test was conducted.

Table 4.9: Correlation coefficient between training received by instructors and the implementation of LMS

			Correlations	
			LMS Implementations	Experience with the Use of Technology – Training/ IT Skills Received
Spearman's rho	LMS Implementations	Correlation Coefficient	1.000	.499**
		Sig. (2-tailed)		.000
		N		53
	Experience with the Use of Technology – Training/ IT Skills Received	Correlation Coefficient		1.000
		Sig. (2-tailed)		
		N		

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

Spearman's rho indicated the presence of a moderate correlation between training received by instructors and instructors' decision in the usage of LMS in higher learning institution., $r_s = .499$, $p = .000$, two tailed, $N=53$.

In testing sub-hypothesis, H5: Prior knowledge or experiences of LMS is related with implementation of LMS in higher learning institution. To test this hypothesis a correlation test was conducted.

Table 4.10: Correlation coefficient between instructor's prior knowledge on LMS and the implementation of LMS

Correlations			Experience with the Use of Technology -Prior Knowledge with LMS	Implementation of LMS
Spearman's rho	Experience with the Use of Technology -Prior Knowledge with LMS	Correlation Coefficient Sig. (2-tailed) N	1.000	.695** .000 53
	Implementation of LMS	Correlation Coefficient Sig. (2-tailed) N		1.000

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

Spearman's rho indicated the presence of a strong positive correlation between prior knowledge or experience of LMS and its implementation in higher learning institution, $r_s = .695$, $p = .000$, two tailed, $N=53$. This data reporting that prior knowledge or experience of LMS is having a significant relationship with the LMS implementation.

In testing sub-hypothesis, H6: Support provided by the top management is related with the success implementation of LMS in higher learning institution. To test this hypothesis a correlation test was conducted.

Table 4.11: Correlation coefficient between top management support and the implementation of LMS

Correlations				
			Implementation of LMS	Experience with the use of technology - Support from Top Management
Spearman's rho	Implementation of LMS	Correlation Coefficient	1.000	.277[*]
		Sig. (2-tailed)		.044
		N		53
	Experience with the use of technology - Support from Top Management	Correlation Coefficient		1.000
		Sig. (2-tailed)		
		N		

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

H_0 : Support provided by the top management is not related with the success implementation of LMS in higher learning institution.

Spearman's rho indicated the presence of a weak correlation between support provided by the top management and its implementation in higher learning institution, $r_s = .277$, $p = .044$, two tailed, $N=53$. The data suggests a significant relationship with the LMS implementation and hence it is said that support provided by the top management is related to the success implementation of LMS in higher learning institution.

CHAPTER FIVE

DISCUSSION

5.0 Discussion

This research has seen data collected from instructors who are teaching and using LMS from 11 different private higher learning institutions in Malaysia and overseas. When testing the hypotheses, all independent variables are having moderate to strong correlations with the dependent variables. In all the main hypotheses, it is found that all hypotheses are supported. The main factors of self-efficacy, attitude towards LMS, experience with the use of technology, teaching style and LMS features are related with the LMS implementation in higher learning institution. From the literatures respective, the findings were found to match the literatures and it was confirmed that self-efficacy is the factor that most strongly correlate to LMS implementation and the least correlate factor is the attitude towards LMS.

Although result from the main hypotheses shown that two main factors Self-Efficacy and LMS features are strongly correlate, this research has more focused and sub-hypothesis made were based on the self-efficacy and lesser focus were given on LMS features. This was because LMS features were added as an additional factor after the pilot study. The research would like to discuss if the LMS implementation is effectively or successful mainly based on instructors factors.

In the process of data analysis, the removal of item 9.5 from the questionnaires was done. This item asked whether participants “usage of LMS is a requirement KPI/KRA set by the department”, were giving a low reliability (Cronbach $\alpha = .511$) when this item are included to gain the average of self-efficacy construct. After removal, the Cronbach $\alpha = .62$ has slightly improved when it is correlate to the dependent variable. This probably due to the ambiguity when setting of the item and/or the participant’s organization does not practice KPI/KRA in his or her organization (higher learning organization). In the near future, a thoughtful step is required when designing the items for questionnaires so that it is not ambiguous and it is clear to the respondents.

It was mentioned in the pilot study interview with 4 instructors, the sub-factor motivation is important for instructor's usage of LMS. The findings confirmed that sub-factor motivation yield a strong correlation. Thus, through interview sessions as well as statistically, this sub-factor is important in the determination of instructor's usage of LMS.

On the other hand, the findings confirmed that opportunity is neutrally affecting instructors on the ground that they will use LMS to further explore their career. The variable are tested by two items, result has showed majority of the respondents chosen neutral 54.7% for item 9.3 "The usage of LMS gives me the opportunity for scholarly pursue such as involvement in research or future professional development." and 37.7% for item 9.13 "LMS has given a chance for me to explore my teaching career deeper.". This is probably because some of the LMS used in the market or in the education industry now are open source, as an instructor who is also an end-user will only adapt it into their teaching and learning instead of using it for future professional development.

Personal reason is hypothesized as not a strong sub-factor in the LMS implementation from the instructor's perspectives is confirmed by the findings of this research. Personal reason such as increase in salary and monetary support for participation or collectively known as extrinsic factors did not have a significant effect on instructor's involvement in the LMS usage in the higher learning institutions. This confirmed the literature studied by Betts (1998) that this personal reason is not the main factors in LMS implementation.

Over the conversation with the 4 instructors who were interviewed in the pilot study have reviewed that they will still use the LMS despite there is no initial training received pertaining to the LMS. However, in many other literatures Gautreau (1998), Ceyhan (2011), Mardhiyah (2011) mentioned that training is a key factor to success implementation and usage of LMS. Through this research, it shows that statistically a moderate relationship is discovered and it is significant. We do not have enough evident to conclude that the training received by the instructors does not have relationship with the instructor's decision in using the LMS. Thus, we can only

conclude that training is correlate or related to LMS implementation. This implies that more research work needed to be done to further prove this practice.

On the other hand, prior knowledge or experiences of LMS is hypothesized to influence the success implementation of LMS in higher learning institution. The result has yielded a strong correlation as it was hypothesized. However, this sub-factor is tested only with one item in the questionnaire, thus it is important to include more items to increase the reliability of the item and in testing with the dependent variable. Thus, when designing the questionnaires in the future; the logic of the question must be put in place to ensure if instructor does not have prior experience or knowledge of LMS, they should not be prompt to answer this question “*My prior experience or knowledge of LMS influences my interest in the usage of LMS in teaching now.*” In this research, if instructors left the name of the past LMS used emptied, it does not necessarily meant that they do not have prior knowledge in LMS. It can be justify as those instructors still able to acquire prior experience or knowledge of LMS by trial and error or “*Learn It Yourself*” as specified by the instructors in the pilot study. Moreover, those instructors may have used some form or another type of LMS or collectively named as “learning system” by their institution but they are not able to recall or attached a name to the LMSs.

The last sub-hypothesis to be testified is the support provided by the top management is related to the success implementation of LMS in higher learning institution. Though the correlation is a weak correlation between the two variables result showed that this factor is still significantly (p value = 0.04) impacting the LMS implementation. This means we cannot reject null hypotheses and since we do not have enough evident to show that support provided by the top management will not influence the success implementation of LMS in higher learning institution. Hence, we will interpret the alternative hypothesis of that the support provided by the top management is related to the success implementation of LMS in higher learning institution. This conclusion is in-line with many literatures mentioned by researchers.

As a conclusion to the discussion section, in order to successfully implement the LMS at the higher learning institution, literature reviews had mentioned that there were many critical success factors to be considered. In this research, the 5 critical

success factors that were identified is Self-Efficacy, Attitude towards LMS, Teaching Styles, and Experiment with the use of technology as well as LMS features. When these factors were tested for correlations, all of them are having relationships from moderate to strong correlations and related with the LMS. Thus, the main hypotheses are supported for this research and these main factors are related with the LMS implementation.

At this end, the multiple regression is used to identify which of these predictor variables (main factors) significantly provide a useful estimate to the success of LMS implementation.

From the result of the regression analysis, it showed that two out of 5 predictors' variables which are Self-Efficacy and LMS features were found to significantly influencing the LMS implementation. This can be explained as for a successful implementation of any system, the systems features are important to influence the usage of its users. In this research particularly, the users are the instructors who must have their self-efficacy in believing that they are able to achieve their teaching goals successfully by using the LMS that has the right features for their teaching. This result is somewhat matching with the true experience of an instructor myself as the usage of LMS is normally voluntary and a good features in the LMS will definitely influence and success usage of it. This will finally leads onto a success implementation of LMS in higher learning institution.

CHAPTER SIX

CONCLUSION AND FURTHER WORK

6.0 Conclusion and Further Work

The research needs to answer the research question “*What are the critical success factors from instructors’ perspectives that will contribute to the success of a LMS implementation in a Higher Learning Institution?*” From the data analysis and its findings, it is found that all the main factors are correlated to each other and these are correlated to the independent variable. The result concluded that the higher the correlation value, the higher the two variables correlates (i.e. the changes in one variable leads to changes to another variable). The five independent variables are positively correlate to the dependent variable and from the instructor perspectives, it is concluded on this research that the Self-efficacy, Attitude towards LMS, Experience with the use of technology, Teaching style as well as LMS features are the main factor that are related to the success of a LMS implementation in the Higher Learning Institution. As coded earlier in the section of literature review in the writing, critical success factors is crucial factor that is needed and focus onto in order to ensure the success of the system or project. So, from the perspective of instructors, this research has concluded that the (2) two factors which are Self-Efficacy and LMS features out of five (5) main factors are predicted to influencing the successful LMS implementation, these factors can be classified as critical success factors to ensure the success implementation of the Learning Management System. As data suggested there are 45.3% of the variations in the LMS implementation is unexplained, this may because of there are others success factors or any form of undiscovered factors. This will probe the researchers for future research work on this area.

The results from the pilot study with the 4 instructors have been re-confirmed by the data collected and analysed from the 53 instructors. The pilot study results were qualitative and when one interviewee commented that “...*self-motivation is very important...*” may seem very subjective and has been confirmed statistically and in this quantitative research that sub-factor motivation is a very strong sub-factor in the LMS implementation. By using this result, the management of the higher learning

institution can be looked into the list of main factors and/or sub-factors from the perspective of qualitative and quantitative when making decision in their implementation of LMS in their institution.

Realizing the short-comings of this research, the following are suggested in the future work.

- ✓ Increase the sample size of the respondents
- ✓ Questionnaire need to be design with logic sequence so that relevant questions are post to the correct respondent
- ✓ More items need to be included in testing each variable.

In order to compare the answer between the qualitative studies (using interview) such as the one that were done in the pilot study, with the quantitative approach (using questionnaires), a mix method can be considered for future work to increase the validity of the research work. More importantly, by using mixed methodology will offer different stakeholders different perspectives of the result that can fulfil their needs and requirements. In this case, a principal of an institution will benefit from seeing how the instructors' usage of LMS relates to the teaching pedagogy while parents of a student will benefit by hearing the testimonials from the instructors on how well the student learnt. The saying of "something for everyone" is suitable here.

As a final conclusion, LMS is a new learning paradigm tools for all stakeholders in the higher learning institution to explore. In order to fully realize its benefit and the success of its implementation, higher learning institution need to consider the acceptance or rejection of the LMS, intrinsic and extrinsic factors and as well as feedbacks and suggestions from the perspectives of all stakeholders (i.e. students, instructors, administrators or even parents in some cases). In the open-ended questions section of this research questionnaire, when asked about any other factors that would motivate the instructor's use of LMS; some remarks or feedbacks given by the instructors are so useful and it worthy to ponder on by the top management of higher learning institution.

Anonymous Respondent (1): "The ability to engage and connect with the students more would encourage me to continue/improve my usage of Blackboard."

Anonymous Respondent (2): "1. User friendly 2. More interesting (visually) features 3. Easy access (easy to log in and speed)"

Anonymous Respondent (3): "Encouragement and earnest implementation by administration and training/clear manual by the LMS provider should have been provided prior to steer the way for lecturers to use the current LMS...."

As a famous quote from Arnold H. Glasglow,

"Success is simple. Do what's right, the right way, at the right time."

Success in a system implementation can be simple if a higher learning institution is ready to accept constructive feedbacks from their instructors meanwhile identifying the useful set of motivating factors, set the right tools (LMS) at the right time for their instructors to deliver the knowledge and content to the students. If all things are right, the success is near!

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APPENDICES

APPENDIX A - Profile of Potential Respondents (Interviewee) in **Pilot Study***

Name	Profile	Interview Session
Dr. Sharlene Lee (Respondent 1 – R1)	<ul style="list-style-type: none"> • Teaching Experience: 4.5 years of teaching experience • Subject taught: Chemistry • Current Portfolio: Lecturer lecturing Chemistry to the Foundation year students. • LMS used or currently using : Blackboard 	16/8/2013 (Friday), 1.00pm- 2.00pm
Ms. Claudine Robson (Respondent 2 – R2)	<ul style="list-style-type: none"> • Teaching Experience: 13 years of teaching experience • Subject taught: Intro to IT/ Computing Studies • Current Portfolio: School of Pre University Studies – School Manager. Had taught IT subjects to the Business Diploma and Degree level students. • LMS used or currently using: Had used LMS developed by the franchise University programme ~ Murdoch University, Perth Australia. (WebCT alike but no clearly printed and specified on the LMS website interface). Also used KCN developed by in-house KDU, Blackboard. 	16/8/2013 (Friday), 2.30pm – 3.30pm
Ms. Chee Choon Won (Respondent 3 – R3)	<ul style="list-style-type: none"> • Teaching Experience: 10 years of teaching experience • Subject taught: Biology • Current Portfolio: A Level Programme Leader & is lecturing Biology to the A Level students • LMS used or currently using : Edu 2.0, Schoology, KCN (a KDU in house developed LMS) 	20/8/2013 (Tuesday), 4.00pm- 5.00pm
Mr. Javier Ferreri (Respondent 4 – R4)	<ul style="list-style-type: none"> • Teaching Experience: 2 years 3 months of teaching experience • Subject taught: Menu Science & Development, European Restaurant Operations, Introduction to Food Service • Current Portfolio: Lecturer lecturing food and beverages to the Culinary Hotel Management students. LMS used or currently using : Moodle, Schoology 	21/8/2013 (Wednesday) 1.30pm- 2.30pm

* Respondents have agreed and given permission for their name and details to be included in this research.

APPENDIX B - Questionnaires