ANALYSIS OF MODIFIED TECHNOLOGY ACCEPTANCE MODEL (TAM) IN E-LEARNING PLATFORM FOR SCHOOL ADMINISTRATORS TRAINING

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by

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LIST OF ABBREVIATIONS

NPQEL   National Professional Qualification for Educational Leaders

LMS   Learning Management System

IAB   Institut Aminuddin Baki (IAB)

MOE   Ministry of Education, Malaysia

TAM   Technology Acceptance Model

OPI   Organisational Policy and Incentives

CSE   Computer Self-efficacy

MOT   Motivation

TS   Technical Support

PBC   Perceived Behavioral Control

MEB   Malaysia Education Blueprint

NPQH   National Professional Qualification for Headship

IT   Information Technology

eLP   e-Learning Portal

IV   Independent Variable

DV   Dependent Variable

SPSS   Statistical Packages for Social Sciences

EFA   Exploratory Factor Analysis

PCA   Principal Component Analysis

VIF   Variance Inflation Factors

APPENDICES

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DIUBAHSUAI DALAM PLATFORM PEMBELAJARAN ELEKTRONIK

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ABSTRAK

Tesis ini bertujuan meninjau penerimaan platform e-Pembelajaran (eLP) oleh pentadbir-pentadbir sekolah yang digunakan dalam Latihan Kelayakan Professional Kebangsaan Kepimpinan Pendidikan (NPQEL) di Institut Aminuddin Baki (IAB). Kajian ini mengemukakan suatu kerangka teori yang mengubahsuai Teori Penerimaan Teknologi (*Technology Acceptance Model., TAM*) asal yang terdiri daripada pembolehubah-pembolehubah persepsi kebolehgunaan, persepsi kemudahgunaan dan kecenderungan mengguna, dan memasukkan pembolehubah-pembolehubah luar yang terdiri daripada efikasi diri komputer, motivasi, insentif dan polisi organisasi, dan sokongan teknikal. Mengaplikasi kaedah penyelidikan kuantitatif dan kualitatif, kajian ini secara spesifik melihat sejauh mana elemen organisasi dan elemen peribadi dan juga elemen platform e-Pembelajaran (eLP) boleh digunakan sebagai ramalan terhadap kecenderungan mengguna platform tersebut. Kajian kuantitatif menunjukkan persepsi kebolehgunaan mempunyai pengaruh langsung terhadap kecenderungan menggunakan platform e-LP. Efikasi diri komputer mempunyai pengaruh langsung terhadap persepsi kebolehgunaan. Sokongan teknikal pula mempunyai pengaruh langsung terhadap persepsi kemudahgunaan. Motivasi mempunyai pengaruh langsung terhadap persepsi kebolehgunaan dan persepsi kemudahgunaan eLP, membuktikan kepentingan

motivasi dalam penentuan penggunaan sistem tersebut. Selain itu, motivasi juga didapati mempunyai pengaruh langsung terhadap kecenderungan mengguna sistem eLP. Persepsi kebolehgunaan pula didapati memoderasikan hubungan di antara Efikasi diri computer dan polisi organisasi insentif dengan penggunaan eLP. Begitu juga dengan persepsi kemudahgunaan yang didapati tidak memoderasikan hubungan di antara polisi organisasi dan insentif dan sokongan teknikal dengan penggunaan eLP.. Perlu juga diberi perhatian terhadap persepsi kemudahgunaan yang didapati tidak signifikan dalam menentukan didapati tidak signifikan dalam menentukan penggunaan eLP dalam latihan berkenaan sedangkan perkara sebaliknya ditunjukkan oleh persepsi kebolehgunaan, sekaligus menunjukkan yang peserta mementingkan manfaat yang mereka perolehi daripada sistem berbanding kemudahgunaan. Maka, kekuatan persepsi kebergunaan ke atas kecenderungan mengguna ini menjadi dapatan yang paling ketara dalam konteks kesan langsung. Ini menunjukkan faktor ini lebih penting dalam menentukan kecenderungan mengguna berbanding persepsi kemudahgunaan. Kajian juga menunjukkan polisi organisasi dan insentif tidak mempunyai pengaruh langsung ke terhadap persepsi kebergunaan dan persepsi kemudahgunaan. Wajar diberi perhatian bahawa dapatan kualitatif dalam kajian ini juga telah membuat triangulasi dengan dapatan kuantitatif. Temuduga separa berstruktur telah mencadangkan perspektif yang pelbagai terhadap pembolehubah-pembolehubah luar dan juga konstruk utama TAM mempunyai perkaitan dengan interpretasi eLP. Dengan ini, TAM yang telah diubahsuai ini memberikan suatu gambaran yang berguna bagaimana faktor-faktor luar mempengaruhi kesediaan penerimaan teknologi.

ANALYSIS OF MODIFIED TECHNOLOGY ACCEPTANCE MODEL (TAM) IN E-LEARNING PLATFORM FOR SCHOOL ADMINISTRATORS TRAINING

ABSTRACT

This thesis aims to explore the school administrators' technology acceptance of an e-Learning Platform (eLP) associated to the National Professional Qualification Educational Leadership (NPQEL) training programme in Institut Aminuddin Baki (IAB). In order to understand what drives the school administrators to use the e-training system in the training, this study proposes a conceptual framework that modifies the standard Technology Acceptance Model (TAM) to include the computer self-efficacy motivation, organizational policy and incentive and technical support as external variables. Employing quantitative and qualitative methods, this study specifically looks at the extent of the external variables of computer self-efficacy, motivation, organisational policy and incentive and technical support and the eLP as predictors to the behavioral intention to use of e-training system among senior school administrators. The quantitative findings indicate that perceived usefulness has direct effect on the behavioral intention to use the eLP. Computer self-efficacy has direct impact on perceived usefulness. Technical support has direct impact on perceived ease of use. Motivation has direct impact on both perceived usefulness and perceived ease of use of the e-learning system, demonstrating its importance in the decision to use the training tool. In addition, motivation has direct effect on the behavioral intention to use the e-learning system. Perceived usefulness

was found to not partially mediate the relationship between computer self-efficacy and organizational policy and incentive with the use of eLP. Similarly, perceived ease of use does not mediate the relationship between organisational policy and incentive and technical support with the use of eLP. It is also interesting to note that ease of use was not significant in determining the eLP usage in the training whereas perceived usefulness was, indicating that utilities gained from the system is more essential than ease of use. Hence, the results indicate that the powerful effect of usefulness on intentions is the most striking results, indicating that this factor is more important in determining intention to use than perceived ease of use does. The results also show that the organisational policy and incentive has no influence and impact on both perceived usefulness and perceived ease of use. It is also noteworthy that the qualitative analyses of this study did triangulate the result arisen from the quantitative findings. . Semi-structured interviews suggest that varying perspectives of the external variables and core constructs of TAM may be related to varied interpretations of the eLP. Hence, the modified TAM provides an informative representation of the mechanism by which the external variables can only influence the acceptance of technology.

CHAPTER 1

INTRODUCTION

1.0   Introduction

This chapter sets the stage by providing an overview of the background of the study that touches on the vision of our nation education system prescribed in the Malaysia Education Blueprint 2013 − 20125 (MEB) and relevant operational shifts that would be required to achieve that vision. Additionally, the problem statements, research questions, objectives, significance and scope of this study are also highlighted to show the importance of this study in investigating factors affecting teachers' acceptance of e-learning technology using the modified Technology Acceptance Model (TAM). In this dissertation, external factors namely organisational policy and incentive (OPI), computer self-efficacy (CSE), motivation (MOT), and technical support (TS) have been incorporated into the standard TAM to examine the acceptance of the e-learning Portal (eLP) as a training tool among school administrators.

1.1   Background of the Study

A nation's success depends fundamentally on the knowledge, skills and competencies of its people in the wake of today's global economy. In addition to traditional school results, the emergence of a knowledge-based economy has accelerated the need for higher-order thinking skills such as creative thinking and problem solving to find innovative solutions to an ever-changing set of problems. Kulik (2003) cited an example where students who used computer tutorials in mathematics, natural science, and social science scored higher on tests in these subjects. Drawing on this, creative and innovative applications of information,

communication and technology (ICT) are seen as important potential tools to transform the educational process so as to support the development of these higher-order thinking skills.

As education plays a central role in any country in pursuant of economic growth and national development, inevitably the need of technology integration in Malaysian education is imminent. The Ministry of Education (MOE) envisions a great success with the integration of technology. ICT will enhance the teaching and learning process across all 10,000 schools in Malaysia (MEB, 2013). Students will be able to access a wider range of more engaging and interactive content. They will be able to learn some lessons at their own pace, and have more options to study through distance-learning programmes. Equally, teachers and principals will have access to both national and international learning resources and communities to help them improve their practice. ICT will be a ubiquitous part of schooling life, with no urban-rural divide, and with all teachers and students equipped with the skills necessary to use this technology meaningfully.

In its effort to leverage the ICT for learning, the MOE aims for all schools to achieve minimum standards of ICT utilisation, capability, availability of infrastructure, and applications that reflect the Smart School official qualification, while integrating ICT into the teaching and learning process. In line with this aim, the MOE hopes to adopt the following principles to guide the development of its ICT strategy: ensuring the fundamentals are in place; building on established foundations; investing in ICT solutions for groups with specific needs; and relying on outcome-based assessments (MEB, 2013)

One of the main priorities in Wave One (2013 to 2015) of MEB is to provide network infrastructure and a learning platform through 1BestariNet. 10,000 primary

and secondary public schools will be equipped with 4G Internet access and a virtual learning environment by the end of 2013. The high-speed internet connectivity and access will make 1BestariNet the catalyst for the inculcation of ICT in the MOE's day-to day operations, and could likely position Malaysia to move to the forefront of ICT innovation in education. Most importantly, the MOE will ensure that all teachers are trained and competent in the use of the virtual learning environment by 2015.

In addition to assets and physical infrastructure, the MOE will enhance its existing training programmes to ensure that all teachers meet a minimum level of ICT literacy by the end of 2015. The system's standard for ICT literacy is based on an established rubric for ICT competency developed by the International Society for Technology in Education (ISTE). Other personnel will also be continuously trained in ICT to ensure that they are capable to deliver their tasks efficiently and effectively. This includes proficiency in more specialised financial and other management applications to support resource management.

The MEB has identified 11 shifts, as appeared in Figure 1.1 that will address five system outcomes of access, quality, equity, unity, and efficiency with quality as a common underlying focus across all shifts. The projected transitions require school administrators and education workforce capable of exploiting the ICT to create a world of critical-thinking students who are able to apply knowledge in different setting. It is in this educational context that the MEB has its justification for introducing e-learning activities through e-learning portal.
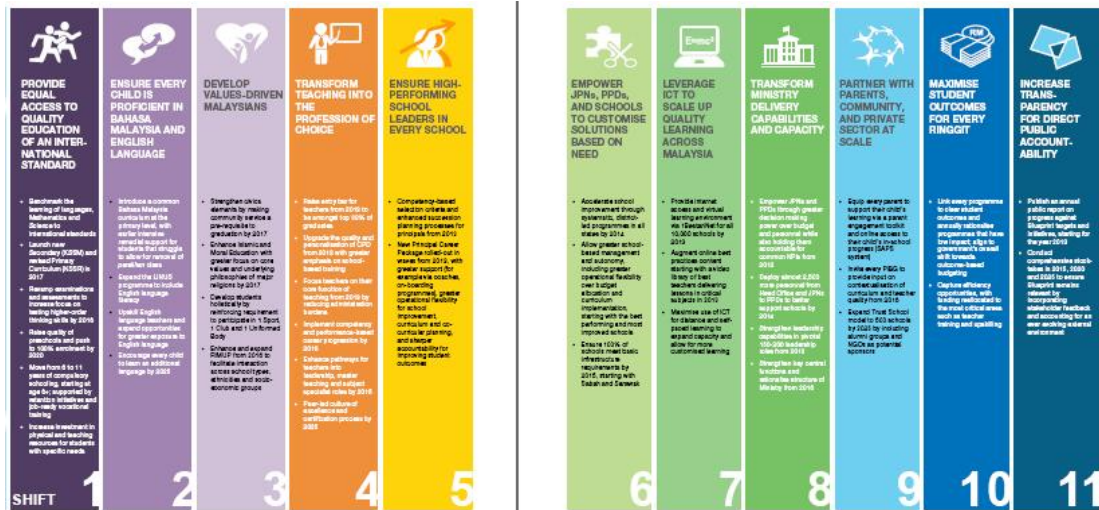
Figure 1.1: The 11 shifts of Malaysia Education

1.1.1 The 5ᵗʰ Shift of MEB

The 5ᵗʰ Shift of MEB 2013-2025 specifically addressed the needs for educational training of future public school leaders (MOE, 2013). It is seen as operational changes of the existing policies. Aspiring school administrators will be required to complete the National Professional Qualification for Education Leaders (NPQEL) in which the eLP is one of its core components. The introduction of the virtual learning environment is expected to develop and enhance learning experiences to promote development of knowledge-based school administrators as advanced by Bates (2000) that the use of new technology will widen access to education and training, as well as improve the quality of learning, improve students' everyday skills they need in their work and life, respond to the technological imperatives, reduce the cost of education, and improve the cost-effectiveness of education (Bates, 2000). In addition, the e-learning has been proven to make training,

teaching and learning feasible on the Internet (Maslin, 2007; Sun, Tsai, Finger, Chen, & Yeh, 2008; Ong, Lai, & Wang, 2004).

1.1.2 The 7th Shift of MEB

ICT is a key element in educational effectiveness in schools. The 7th Shift represents a change in strategy and direction as it calls for leveraging ICT to scale up quality learning across Malaysia. As discussed in earlier section, the Malaysia education system tries to inculcate the ICT in its efficient ways to enable teachers and students to access and gain knowledge. The highlight of this shift is the 1BestariNet network for all 10,000 schools by 2013 that will serve as the basis for the creation of virtual learning environments. Complementing the 5th Shift, competency training for all teachers will be gradually improved to help them use the technology meaningfully.

The creation of the eLP as a learning management system will also encourage the distance and self-paced learning. Communications using such system will help by saving time and expenses, and assessing information and knowledge worldwide free of charge. Students will enjoy greater personalisation of their educational experience where they share learning resources, run interactive lessons, and communicate virtually. A comprehensive study by Syed Abdullah, Hanafi, and Cheah (2005) revealed that the interactive element in a learning management system created a positive learning environment through the high level communication exchanges. Students will also be able to learn at their own pace. Additionally, students will be able to pursue subjects that are not offered at their own school and learn directly under the best teachers in the country.

The use of learning management system will help in changing school administrators' professional practice especially in the assessment process and administrative matters (Ryan, Scott, Freeman, & Patel, 2000). They can work more effectively, the quality of their working life will be better, consequently helping the school to achieve its educational strategies and goals. The introduction of the eLP portal as a training tool is expected to enhance learning experience in the development of knowledge-based school leaders, as well as to provide efficient and cost effective training, as addressed in the 5th and 7th Shifts of MEB (MOE, 2013). LMS technology has provided the means to create positive and engaging learning environment with adequate opportunities of vital elements in the learning process (Syed Abdullah, Hanafi, & Guan, 2005). The eLP also represents a move away from current practices in the way the MOE has historically trained the teachers.

1.2   Problem Statement

The quality of school administrators is the second biggest school-based factor in determining student outcomes, after teacher quality. Comprehensive research on school leadership revealed that an outstanding school administrator can raise student achievement up to 20 percents (MEB, 2013). Moving up the career path, aspiring teachers become school administrators who play the role as both instructional and administrative leaders.

Leaders influence the technology change in an organisation (Bilig, Sherry, & Havelock, 2005) as the notion of introducing a new technology such as the eLP into practice is timely. Thus, in an educational setting, Chang (2005) suggested that school administrators identify the relationship of technology, vision and school mission with education policy to understand the importance of it.

Literature on school improvement and school effectiveness suggests that effective leadership creates effective schools (UNESCO, 2009). The national education agenda envisaged the development of future school administrators to lead the learning institutions to a greater excellence in all areas of interest (IAB, 2012). Efficient, effective, and respected school administrators not only develop their personality, attitude, and skills, but also search for new knowledge and enrich their experience (Khuan et al., 2004).This aspiration is in line with Malaysia Education Blueprint 2013-2025 (MEB) and rapid advancement in education, locally and globally. As education has always been a national priority, the MOE feels the urge to produce future school leaders with new knowledge and skills in school management in order to keep the competent workforce in the education world. To be effective, school administrators need professional development to enhance their knowledge and to keep up with leading information technology integration in education.

As discussed in the previous section, Malaysia has long recognised the transformative potential of ICT in education. The UNESCO (2012) review noted that Malaysia was among the first few countries in the world to have pioneered a strategic ICT plan for its education system. The UNESCO (2012) review also noted an "impressive array" of policies and plans developed since 1990, including the *Smart School Roadmap* and the *Policy on ICT in Education 2010*. The goal is to harness the potential of ICT to enhance and improve the overall quality of education.

Accordingly, one of the most capital-intensive investments the MOE has made in the past two decades has been in the ICT infrastructure for schools. From 1999 to 2010, the Ministry has invested approximately RM 6 billion on ICT in education initiatives (MEB, 2013). A huge amount of RM 2.6 went towards additional computer laboratories to support the English for Teaching of Mathematics

and Science project (ETeMS) and the building of a computer lab in every school (RM2.5 billion).

However, a study by the MOE (2010) found that ICT usage was relatively limited where approximately 80% of teachers spend less than one hour a week using ICT, and only a third of students perceive their teachers to be using ICT regularly. Critically, the UNESCO (2012) review further noted that even when ICT is used in teaching, in most cases it has not gone much beyond the use of *PowerPoint* as an instructional tool. There is no evidence that ICT is being used to foster students' creativity, problem solving, and critical thinking and communication skills. (UNESCO, 2012).

The fact that the instructional tool usage by teachers has not gone much further than the use of word-processing applications (UNESCO, 2014) is worrying. ICT has tremendous potential to accelerate the learning of a wide range of knowledge and thinking skills. Sadly, this potential has not yet been achieved. Therefore, the potential of ICT to accelerate knowledge and thinking skills need to be achieved. Besides, the intention also relates to the extensive use of ICT to automate and mechanise work processes such as the processing of official forms, timetable, management of information system, lesson planning, financial management, and the maintenance of inventories. The reality of this need recalls the policy to increase productivity, efficiency and effectiveness of the school management system. MOE believes that properly designed and implemented computing and communication platform will revolutionise the education as profoundly as it has transformed medicine, finance, manufacturing, and other sectors of society.

One reason usage still appears to be limited is that the ICT hardware was rolled out without sufficient training and support services to schools, such as technicians to maintain the equipment (MEB, 2013). Even in cases where training and support were provided, it was often not continuous or sustainable. As such, teachers were ill-prepared in terms of how to actually use the computers in their day-to-day work. This finding suggests that high-end facilities, like computer laboratories, smart classrooms, and science laboratories only become useful once teachers and students alike know how to use the technology and equipment in meaningful ways within learning processes. In order for a technology-based system to work, it must actually be accepted, adopted, and utilized by the users (Leidner & Jarvenpaa, 1993). In addition, the effective use of technology in delivering e-learning based components of a course is of critical importance to the success and acceptance of e-learning. In order for the technology to work, it must actually be used and optimised by the users.

Another issue is the lack of a long-term strategy for sustaining and scaling up key policy implementation elements, such as ICT infrastructure and teacher competencies. For example, there is no explicit guaranteed period of computer renewal, such that schools that received equipment in the early 2000s are now in dire need of renewal. In line with the earlier findings on resource productivity, these investments have not been consistently linked to a clear set of expected student outcomes, and have not been rigorously monitored to determine impact.

Malaysia's consistently high levels of expenditure on education have resulted in almost universal access to primary education, and significant improvements in access to secondary education. However, return on investment (ROI) is not as high as desired. Data as of 2010 indicates that Malaysia's performance lags behind other

countries that have similar or lower levels of expenditure per student, such as Thailand, Chile, and Armenia (World Bank, 2011). This suggests that the system may not be allocating funds towards the factors that have the highest impact on student outcomes, such as the training and continuous upskilling of teachers. Therefore, there was a surprisingly high degree of consensus on the importance of raising the quality of teachers (MEB, 2013). As suggested by McKinsey (2010) report the training and continuous upskilling of teachers will have great impact on student outcomes. Students must be best-prepared to meet the challenges of a 21st century economics. This aspiration undoubtedly requires the need of high competency teachers.

People view technology from different perspectives. However, there is a general tendency for people to view new technology positively. The technology must actually be used (Leidner & Jarvenpaa, 1993) to make it works. However, organisations need to justify the sizeable investment and the downtime that occurs to ensure the new technology being introduced is used to the fullest potential. An underutilised technology will not provide the anticipated return of investment. This is the outcome for an organisation that adopts new technology when it is not really in their best interest (Willis, 2008). Often, as claimed by Abrahamson (1991), when a new technology is expensive and costly to implement, it does not add value to the organisation. In such situation, neither side of the technology is meaningful to the organization.

The success of any technology initiative would still depend largely on human, even when all the systems are provided and made available to the individuals, In most cases, individuals fully utilising the technology that has been adopted by their organisation would likely increase their performance (Davis, Bagozzi, & Warshaw,

1989). In contrast, Henderson and Divett (2003) found that many system performance inefficiencies are caused by behavioral errors rather than software or mechanical failures. Users fail to use the new technology as required by the stakeholders and decision makers.

Davis (1989) proposed the TAM to explain the potential user's behavioral intention to use a technological innovation. Most of the studies on technology acceptance used TAM as the base model and extended it with other constructs. Notably, there have been many technology acceptance studies in the field of education. However, analysis of related literature revealed that majority of the studies on e-learning acceptance has been done on students, teachers and pre-service teachers, as shown in Table 1.1. Findings of TAM relationships are not borne out in all studies as there remain a wide variation of predicted effects with different types of users and system (Wing & Ding, 2012). Relevant to the current needs in education, effective and knowledgeable school administrators in technology is equally important in making decisions, adopting to school changes and increasing the communication in organisation (Mohd Izham, et al., 2014). Moreover, extensive literature search revealed that there is no similar study related to acceptance level of utilizing the eLP as the new learning tool in a teacher training environment, as previous study was mainly on the demographic and pedagogical aspects of the course (Kamaruzaman et al., 2012). Hence, it is imperative to discover the antecedents which can explain and predict the acceptance of such system in the context of training of school administrators.

Table 1.1

e-learning acceptance studies in education

User type	Base model/theory	Construct	Studies
Students	TAM	Perceived usefulness, perceived ease of use, attitude, behavioral intention	Maslin, 2007
	Extended TAM	Perceived usefulness, perceived ease of use, attitude, behavioral intention	Chen et al., 2012; Liuet al., 2008; Sujeet & Jyoti, 2013; Lee, 2010;
Teachers	Extended TAM	Perceived usefulness, perceived ease of use, subjective norm, facilitating conditions, behavioral intention	Teo, 2011; Pynoo et al., 2012
Pre-service teachers	TAM	Perceived usefulness, perceived ease of use, attitude towards computer use, intention to use	Teo et al., 2009
	Extended TAM	Perceived usefulness, perceived ease of use, attitude towards computer use, intention to use computer self-efficacy	Teo, 2009; Wong et al., 2012
Sshool senior administrators Facilitators	Modified TAM	Computer Self-efficacy, motivation organisational policy & incentive, technical support	This study

TAM allows for the external variables that impact the behavioral intention to use to be added to the model. Therefore, this study attempted to modify the standard

TAM by incorporating external factors in terms of organisational policy and incentive, technical support, computer self-efficacy and motivation.

In view of the need of the predictors, Venkatesh and Davis (2000) identified various external factors such as individual and organisational elements that impinge behavior, as determinants of perceived usefulness and perceived ease of use. Based on the finding, this study proposed the organisational policy and incentive, technical support, computer self-efficacy and motivation as external variables. Modifying the existing TAM with such external variables will also be of particular interest to obtain the effectiveness result (Taylor & Todd, 1995).

1.3   Research Objectives

Since individual and organisational characteristics influence a person's intention to use the information technology based system (Walker, 2005), organisational policy and incentive, technical support, computer self-efficacy and motivation are important variables in determining the extent to which the technology is accepted by users. Therefore, the objectives of this study are:

(i)   To study the computer self-efficacy, motivation, organisational policy and incentive, and technical support factors that influence school administrators' acceptance of the eLP as a training tool.

(ii)   To identify the key drivers of the school administrators' acceptance of the eLP as a training tool.

1.4 Research Questions

The modified TAM consists of four external variables connected to the existing TAM. Therefore, this study proposes the following research questions for the modified TAM:

Q1:   Is there any effect of computer self-efficacy on perceived usefulness of eLP?

Q2:   Is there any effect of motivation on perceived usefulness of eLP?

Q3:   Is there any effect of motivation on perceived ease of use of eLP?

Q4:   Is there any effect organisational policy and incentive on perceived usefulness of eLP?

Q5:   Is there any effect of organisational policy and incentive on perceived ease of use of eLP?

Q6:   Is there any effect of technical support on perceived ease of use of eLP?

Similarly, the following research questions were put forward for the standard TAM.

Q7:   Is there any effect of perceived ease of use on perceived usefulness of eLP?

Q8:   Is there any effect of perceived ease of use on behavioural intention to use the eLP?

Q9:   Is there any effect of perceived usefulness on the behavioural intention to use the eLP?

This study recognises the role of the facilitators in the training programme. Even though their teaching presence in eLP were at a lower level where they only

provided feedback on trainees' assignments, graded the coursework, and answered the emails upon request, their experiences and perspectives were undoubtedly important. Literature reviewed suggested that qualitative research questions begin with the words *what* or *how* "to convey an open and emerging design" (Creswell, 2009, p. 131). In addition Creswell (2009) also proposed the use of exploratory verbs such as *describe*, *discover*, *explore*, and *report*, that are non-directional in the qualitative research questions. As qualitative part of this study seeks to describe the experience (e.g., phenomenology) of the facilitators, the following central research question was put forward:

Q 10: How do the facilitators describe their experiences and perspectives on the eLP and on the trainees' learning engagement?

1.5 Significance of Study

An abundance of research on technology acceptance has investigated the relationship among external variables and existing variables of TAM (Alharbi & Drew, 2014; Talukder, Harris & Mapunda, 2008; C'Brien, 2010). However, acceptance of a new system in relations to learning management system by individuals is still considered a major issue for both e-learning practitioners and scholars; hence an investigation on it would provide a critical factor in the success of e-learning (Paulsen, 2003; Hasan, 2007; Sami & Pangannaiah, 2006). Organisational policy & incentive, technical support, motivation, and computer self-efficacy were not part of the original TAM, but were added in this study to help explain the influence that teachers have on the behavior of an individual. Davis (1989) did identify various external factors such as individual elements and organisational

controlled interventions that impinge behaviour, which potentially are determinants of perceived usefulness and perceived ease of use. That is, the impact of these external variables on behavioural intention to use technology is fully mediated by the two beliefs of perceived usefulness and perceived ease of use.

The significance of the research will also reach out to the national policy makers within Malaysian education context to add meaningful and effective strategic planning to the existing e-learning policies. Ismail (1993) stressed that planning ICT policy is not merely compiling wish list for future performance but should also include a strategic response to change because strategic planning establishes an institution commitment to change. It is within the strategic planning that the mission, core values, goals and broad objectives are specified (Anderson, Johnson & Milligan, 1999) to assess how the circumstances are changing.

In support of Davis, (1989), Walker (2005) also pointed out that both the external factors influence a person's intention to use technology based on the necessary skills, competencies, and organisational support. Therefore, the model generated from the research should provide a useful tool for stakeholders and management to understand the determinants of usage behaviours in order to proactively design interventions targeted at specific population of eLP users.

Technology performance is both a function of its capabilities and the extent to which these capabilities are accepted and used by individuals. User acceptance and use are necessary to realise the potential productivity gains from investment in a system (Agarwal & Prasad, 1997). If the institute and education managers understand why the technology innovation is accepted or rejected, they can come up with intervention activities to reduce the underutilised learning system, and assist the trainees in adopting and using the system more effectively. The findings will provide

the institute with relevant information to achieve greater technology acceptance among the course participants in the future.

1.6   Theoretical Framework

The theoretical grounding for this study originates from the TAM (Davis *et al*., 1989). TAM presents a theoretical basis for describing behavioral and affective reactions to Internet technology (Ramayah, Zainuddin, & Fok, 2003).
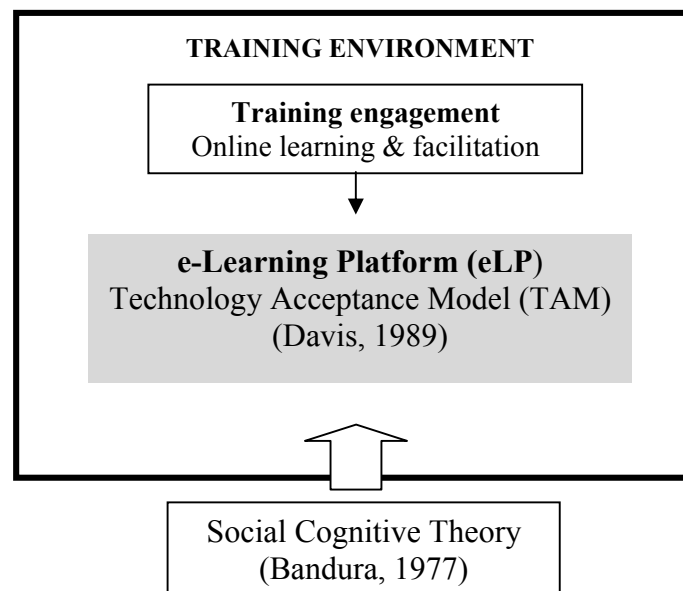
Figure 1.2: Theoretical framework

Figure 1.2 illustrates the theoretical framework of this study. The inclusion of Social Cognitive Theory (Bandura, 1977) is done due to the following justification. TAM has emerged as an especially important theoretical model developed to explain individual reactions to computing technology (Adams, Nelson, & Todd, 1992; Mathieson, 1991). However, the model does not explicitly consider how individuals'

expectation of their capabilities influences their behavior. On the other hand, the Social Cognitive Theory believes that if an individual doubts his or her capabilities to successfully adopt a behavior, the beliefs about the outcome may be insufficient to influence behavior in certain situation. In view of this, the theoretical framework adds the Social Cognitive Theory that explains how individuals' expectations of their capabilities influence their behavior, which is not explained in TAM.

1.7   Conceptual Framework

Figure 1.3 shows the conceptual framework or the research paradigm of this study. It embodies the specific direction by which this study will have to be undertaken. It is the researcher's idea on how the research problem will have to be explored.
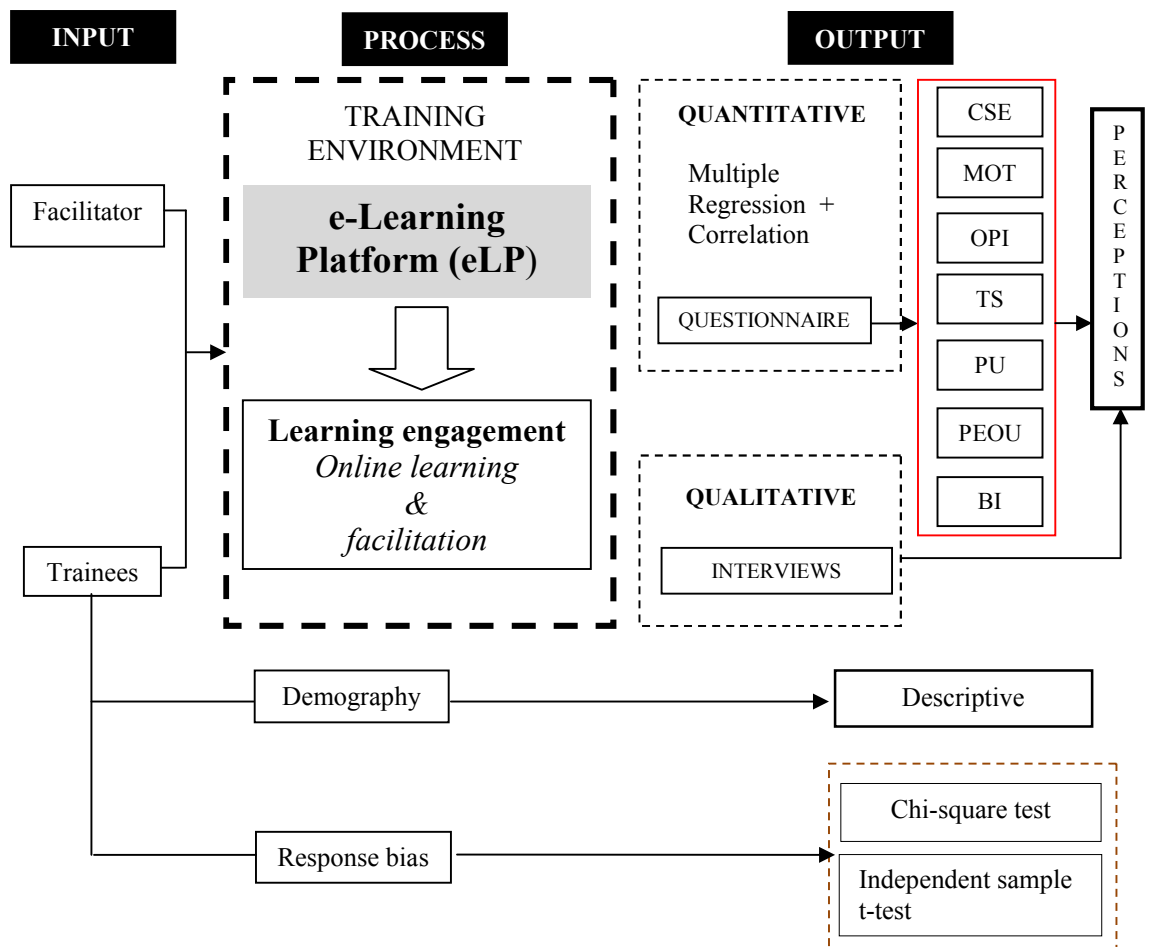
Figure 1.3: Conceptual Framework

Statistically, the conceptual framework describes the relationship between variables identified in this study, namely the computer self-efficacy, motivation, organisational policy and incentive, and technical support factors that potentially influence a users' behavioral intention toward a system. Furthermore, Figure 1.3 outlines the input, process and output of the whole investigation.

1.8   Research Hypotheses

Based on recommendations by researchers in this domain (Venkatesh & Davies, 2000; Chen, Gillensen, & Sherrel, 2002) that the work and extension of TAM should continue, the conceptual framework of this study integrates computer

self-efficacy, motivation, organisational policy and incentive, and technical support as external variables to the standard TAM (Davis, 1989).
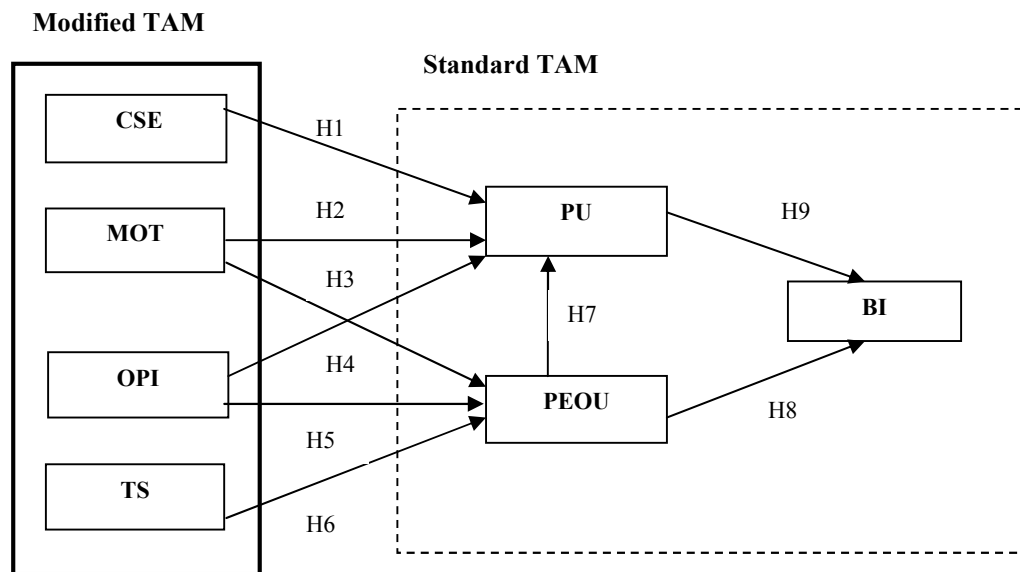
Figure 1.4: Hypothesized model of the study

Figure 1.4 illustrates the hypotheses to be tested in this study based on the standard TAM model (Davis, 1989). Figure 1.3 also illustrates the connections between the three parts of the existing TAM (H7, H8, and H9) and connections from the proposed new external factors to the TAM (H1, H2, H3, H4, H5, and H6) as hypotheses. The direction not only signifies a relationship, but also tells what variables a factor depends on. The arrows represent the direct effects between the variables involved. An indirect effect represents those effects through the intervening variables.

Based on Figure 1.4, this study attempts to modify the standard TAM (Davis et al., 1989) by incorporating the as the external factors to the original model. Perceived usefulness and perceived ease of use will be the intervening variables of

the computer self-efficacy, motivation, organisational policy and incentive, and technical support towards the intention to use the eLP.

The hypothesized model of the study (Figure 1.4) intentionally uses the standard TAM (Davis, 1989) minus the actual usage of the technology construct. The eLP is a new technology being used as a component in the training. Therefore, it is a new phenomenon which has not caught on with the trainees. Ramayah et al., (2002) suggested that a study on the technology acceptance in such context stops at the intention to use and exclude the actual use. In addition, behavioural intention to use "which Theory of Reasoned Action assumes to closely linked to actual behavior" (King & He, 2006, p. 740) was identified as "a better predictor of actual usage than either perceived usefulness or perceived ease of use" (Turner et al., 2010, p. 470). Warshaw and Davis (1985 defined intention as the degree to which an individual has formulated conscious plan to perform or not to perform some specific future behavior.

1.8.1 *Hypotheses in relation with computer self-efficacy and TAM variables*

Computer self-efficacy as an external variable has been widely documented in the context of TAM research (Mohd Shoki, 2013. Past research on computer self-efficacy as a construct spreads across different discipline. These studies include internet banking and commerce (Amin, 2007; Guriting & Ndubisi, 2006; Reid & Levy, 2008), computer and Internet usage among academician and teachers (Seyal & Rahman, 2007; Fagan, Nelil, & Woolridge, 2004; Chang, & Guo, 2008), Web-based medical records (Ma & Liu, 2005), multimedia ERP system (Scott & Walczak, 2009), and virtual world second life (Shen & Eder, 2009). Most of the research examines the impact of computer self-efficacy mediated through perceived ease of

use, not perceived usefulness (Ma & Liu, 2005). Nevertheless, there are also studies reporting the findings of the impact of computer self-efficacy only through mediation by the construct perceived usefulness, as well as studies that examined the effect through both perceived ease of use and perceived usefulness.

Table 1.2

Studies on computer self-efficacy using TAM

Studies	Effect of computer self-efficacy on behavioural intention mediated through	
	Perceived usefulness	Perceived ease of use
Venkatesh and Davis (1996)	Not tested	Yes
Venkatesh (2000)	Not tested	Yes
Chau (2001)	Yes	None
Chan and Lu (2004)	Not tested	Yes
Guriting and Ndubisi (2006)	Yes	Yes
Seyal and Rahman (2007)	Yes	Not tested
Hasan (2007)	Yes	Yes
Amin (2007)	Yes	Yes
Reid and Levy (2008)	Yes	None
Scott and Walczak (2009)	Yes	Yes
Chen et al. (2011)	Yes	Yes
This study (2015)	Yes	Not tested

A summary of these studies on the effect of computer self-efficacy on behavioral intention to use appears in Table 1.2. Research studies have found the effect of computer self-efficacy on perceived usefulness has observed varying results.

Computer self-efficacy, as well as computer attitude, and personality (risk taking and autonomy), have positive significant effects on Internet usage mediated through perceived usefulness (Seyal and Rahman , 2007). In another study, Chau (2001) identified a small negative impact on perceived usefulness and no impact on perceived ease of use. However, Venkatesh (2000) found that computer self-efficacy has a significant impact on perceived ease of use, both before and after gaining the computer experience.

A sustainable education reform requires the school administrators to be technology literate. Statistics suggests that there are currently 10,154 government-funded schools under MOE (MOE, 2015). Accordingly, as envisioned in MEB 2013 – 2025, every school will have a high performing principal or headmaster who is relentless in focus, both academic and non-academic (MOE, 2013). The school administrators will serve as both instructional and technology leaders in their own right. One of the missions of administrators as technology leaders is to form and implement new strategies to assist teachers to identify, understand and integrate the technology of teaching and learning (Creighton, 2003). This seeks the school administrators to change the existing practice by optimising the virtual learning environment which will provide access to both national and international resources (MOE, 2013). Therefore, revealing their effect of computer self-efficacy on their acceptance of using the eLP is crucial since it is likely to provide specific intervention to assist future participants in the training programme of school administrators.

The concept of computer self efficacy is about "the judgment of one's ability to use a computer" (Compeau & Higgins, 1995, p. 192) and this ability will lead to more favourable behavioral intention to use through its influence on perceived

usefulness and perceived ease of use. Once developed, it becomes a very stable trait that even a failure could not do away with the level of computer self-efficacy in an individual (Saleh, 2007).

Individuals who did not see themselves as competent computer users tend not to use computers (Oliver & Shapiro, 1993). Compeau and Higgins (1995) also noted that individuals with higher computer self efficacy beliefs tend to see themselves as able to use computer technology. Those with lower computer self efficacy beliefs tend to become more frustrated and anxious when working with computers; and become hesitate to use computers when they encounter obstacles. The definition by Compeau and Higgins (1995) gives a key idea that in the context of computer use, computer self efficacy is not concerned with individual's past behaviors, but with judgments of what the person is able to do in the future.

Exposure to technology integration in school environment brings computer experience, revealing their computer self-efficacies. It is argued that self-efficacy (in this case the computer self-efficacy) behaves as proximal determinant of behaviour (Bandura, 1982, 1986). According to Gist and Mitchell (1992), self-efficacy is linked to expectancy, where expectancy affects actions. Thus, it is hypothesized that computer self-efficacy will affect perceive usefulness towards the intention to use the eLP.

H1:   Computer self-efficacy has a positive and direct effect on perceived usefulness of eLP.

Hill, Smith and Mann (1987) found that computer self efficacy is an important determinant of one's decision to use computer technology. Similarly,