FACTORS AFFECTING CONTINUANCE ADOPTION OF E-LEARNING BY INSTRUCTORS IN MALAYSIA HIGHER EDUCATION INSTITUTIONS

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Dedication

This thesis is dedicated to my beloved family members and my lovely friends

for they are my source of inspiration, aspiration and motivation......

DECLARATION

I hereby declare that the project is based on my original work except for quotations and citation which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at USM or any other institutions.

(Signature):

Name: Goh Hsiao Yee

Date: 26th December 2011

NO. PINDAAN: 00

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ABSTRAK

Dengan pembangunan teknologi dan internet, semakin banyak universiti awam di Malaysia berusaha dan melabur dalam e-pembelajaran. Kemanfaatan e-pembelajaran tidak dapat dimaksimumkan melainkan jika pengajar and pelajar menggunakan system tersebut. Ramai penyelidik sebelum ini mengkaji penggunaan berterusan sebagai ukuran kejayaan e-pembelajaran. Kajian ini juga mengikut arah yang sama. Berdasarkan Model Penerimaan Teknologi (Technology Acceptance Model), Model Seddon and Model Penerusan Sistem Maklumat selepas Penerimaan (Post Acceptance Model of IS-continuance), kajian ini mengkaji niat penerusan dalam penerimaan-pakai e-pembelajaran oleh pengajar di Institusi Pengajian Tinggi Awam (IPTA) Malaysia. Ia bertujuan untuk memberi lebih banyak pandangan demi membantu membuat keputusan strategik dan perancangan lalu meningkatkan keberkesanan dalam penyampaian e-pembelajaran pada masa depan. Usaha ini melibatkan pemeriksaan model cadangan dan pembolehubah untuk niat penerusan dalam e-pembelajaran, yang terdiri daripada kegunaan dilihat, kemudahan penggunaan dilihat, pengesahan, kualiti system, latihan, penyerapan kognitif, tabiat, motivasi intrinsik, keberkesanan diri dalam computer, kemudahan keadaan, kepuasan dan pengaruh social. Pemodelan struktur, sebahagian kuasa dua terkecil (partial-least-squares) telah digunakan untuk menilai model cadangan tersebut. Model hipotesis ini disahkan secare empirik dengan menggunakan data yang dikumpul daripada 142 pengajar yang mengguna e-pembelajaran dari pelbagai IPTA di Malaysia. Keputusan kajian ini mencadangkan bahawa niat penerusan pengajar-pengajar ditentukan oleh kegunaan dilihat. Model cadangan disokong and diterangkan sehingga varians setinggi 71.3% dalam niat penerusan e-pembelajaran. Implikasi and batasan juga dibawa bincang.

ABSTRACT

With the development of technology and internet, more and more public universities in Malaysia has put in their effort and investment in e-learning. The benefits of an e-learning system will not be maximized unless instructors and learners use the system. Many previous researchers have looked at continued usage as a measure of success of e-learning. This research also follow the same direction. Based on Technology Acceptance Model (TAM) and Post Acceptance Model of IS-continuance, this study looked at the continuance intention in e-learning adoption by instructors in Malaysia Higher Education Institutions (HEIs). It was intend to provide more insight to assist in strategic decision and planning and thus improve the usage and effectiveness of e-learning delivery in future. The work involved the examination of the proposed model and variables for e-learning continuance intention, which consisted of perceived usefulness, perceived ease of use, confirmation, system quality, training, cognitive absorption, habit, intrinsic motivation, computer self-efficacy, facilitating conditions, satisfaction and subjective norms. A partial-least-squares structural modeling approach was used to evaluate the proposed model. The hypothesized model is validated empirically using data collected from 142 instructors of e-learning system users from various HEIs in Malaysia. The results suggest that instructors' continuance intention is determined by perceived usefulness. The proposed model was supported and explained up to 71.3% of the variance in e-learning continuance intention. Implications and limitations were discussed.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Changes in technology and society have transformed our daily communications. Social network sites are gaining rapid popularity especially among young people, for example Facebook, Twitter, etc. Besides, the chat function that a mobile phone has become a social tool for young people to keep in touch with friends. Young people nowadays spent more time on communications via technology tools and they are good in using these tools to support them in many aspects of their lives.

According to Trombley and Lee (2002), e-learning generally refers to learning methods where electronic instructional content were delivered via the internet and is a term which is synonymous with Web-based or online learning. Besides distance learning and flexible learning where employed e-learning, e-learning can be used in face-to-face teaching as well which is known as blended learning.

In higher education, instructors help students acquire knowledge and skills by using online module. Face-to-face class times were normally used to focus on application, case studies, and develop decision making skills (Cottrell & Robinson, 2003).

According to Raja Maznah Raja Hussain (2004) changes in teaching and instructional methods from traditional to online method of instruction always create dramatic shifts in instructors and their students. And it is always hard for them to accept the changes within short period.

1.1.1 E-learning in Malaysia

Higher education institutions (HEIs) in Malaysia have been challenge by new Information and Communication Technology (ICT). The fast paced changes in ICT have force HEIs in integrating wide range of ICT into teaching and learning. Many educationally-based industries such as universities and colleges start offering e-learning environment by setting up portals. E-learning is use not only for long-distance and off-campus programs but also as teaching aids to support conventional teaching (Khalid, Yusof, Heng, & Yunus, 2006).

Although e-learning is not new in Malaysia, but its usage is not remarkable. The development of technology in education in Malaysia can be divided into two phases (Hussin & Mohd Salleh, 2008). In phase 1, e-learning focuses on electronic gadgets that are used as teaching tools to facilitate the teaching and learning process. Internet was not part of e-learning during the phase. Instructors use projectors (overhead projectors, slides projectors, direct projectors etc.), video tape or cassette players, radio, television broadcasting and CD-ROM. All these items were used to show illustrations, to demonstrate certain processes and to explain the difficult concepts. During this phase, USM (Universiti Sains Malaysia), who pioneered the off-campus degree program, also known as distance learning programme in Malaysia, used these technologies in their teaching activities. In the mid-70s, UiTM (Universiti Teknologi MARA, formerly known as Institut Teknologi MARA) started to offer off-campus program in all its 13 branch campuses.

```
                                    Wireless
                                             Mobile

                                    Broadband

Correspondence:    Off-campus       E-learning I        E-learning II
Paper-based        Paper-based      Electronic-based    Electronic-based

    |         |         |         |         |         |         |

  1960      1970      1980      1990      2000      2010      2020

                          Telephone           Online materials,
                          Conferencing        Discussion; CNC
                Radio
                Broadcasting
                                      Video
                                      Conferencing

                          Satellite
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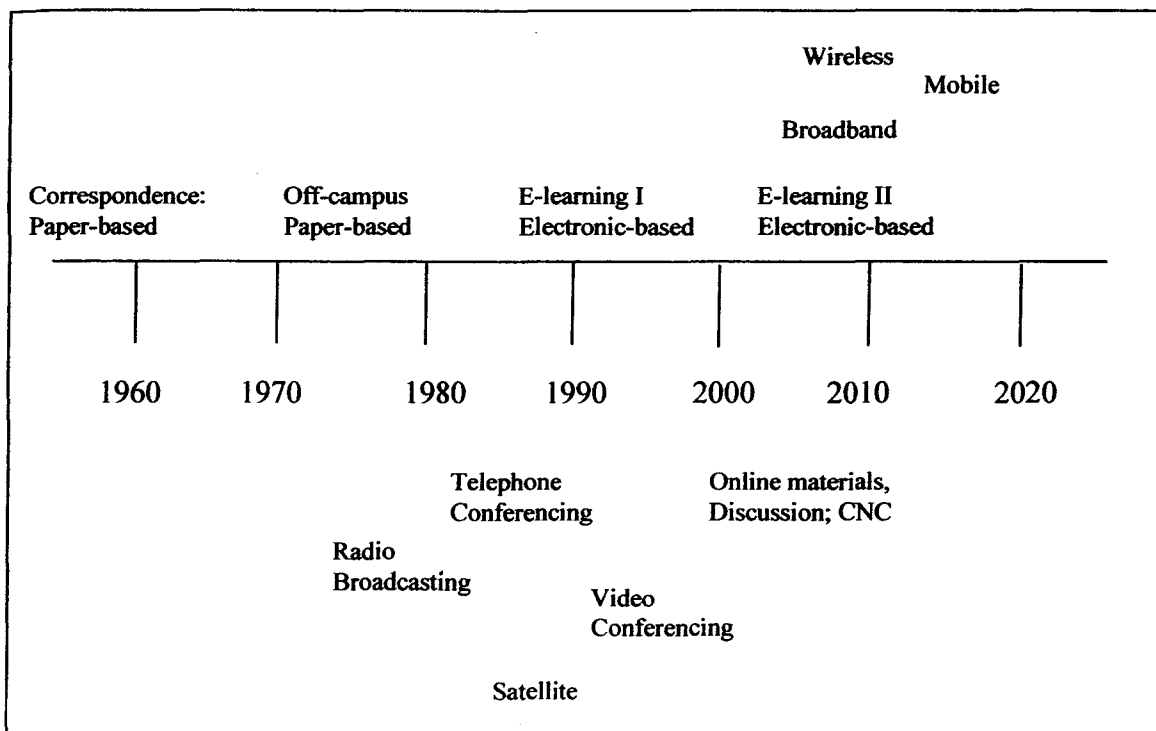
Figure 1.1 A continuum of technological integration in education in Malaysia

(Source: Hussin & Mohd Salleh, 2008)

Second phase of e-learning in Malaysia started when internet was introduces in early 1990s, in cable networking forms (LAN, WAN) and now with wireless connection. In this phase, e-learning development moves at a tremendous speed. UNITAR (Universiti Tun Abdul Razak) was set-up with hi-tech facilities to run course online and to maximize the use of modern technology in their teaching and learning activities. MMU (Multimedia University) offered online courses with minimal numbers of face-to-face meeting in classroom. Early 2000, OUM (Open University Malaysia) started to run academic programs online by exploiting the potentials of ICT facilities. This was done by setting up a consortium with at least five representatives from public universities these three universities were the leading e-learning institutions in Malaysia, with OUM having the

largest numbers of students in an open learning environment. As the first Open University in the country, OUM initially has 753 students in August 2001, but now OUM has more than 90,000 students in January 2010. Other universities in Malaysia employed blended learning during this stage. The development of e-learning in Malaysia is illustrated in Figure 1.1.

From Figure 1.1, e-learning was conducted using low-level technology (paper-based) initially. E-learning was moved to off-campus and electronic-based in the later stage, before it adopts network-based learning. Hussin & Mohd Salleh (2008) suggested that mobile learning will flood the education setting in future.

In 1996, National IT Agenda (NITA) was launched by National IT Council (NITC) with the visions to build information and knowledge society with ICT. The final objective is to have a values-based knowledge society by the year of 2020.

NITC Strategic Agenda was formulated with five key areas to "migrate the country to the E-World of the new millennium". Among all, E-Learning as a key area which formulated through ICT to create and develop, learning networks for communities either formal or informal, with the goal of cultivating a life-long and continuous learning for individual, organizational and societal advancement.

Under Higher Educational Strategic Plan (NHEAP) 2007-2010, the Ministry has outlined its focus on seven strategic thrusts which two of it's include improving the nature and characteristics of teaching and learning and enculturation lifelong learning. In year 2007, Wawasan Open University has been established. It is the first private and not-for-profit, open learning institution in Malaysia.

Recently, the initiatives of government supported by Telekom Malaysia Berhad (TM) by offering the netbook and free broadband package with a minimal monthly charges to 100,000 university students aim to increase the usage of ICT is one of the successful strategy to create knowledge based society besides increase the broadband penetration rate.

With the effort of government, E-learning has become popular among various ICT tools as it is offered great teaching and learning experience, allows self-paced learning and promoting lifelong learning. Almost all public universities in Malaysia has it owns learning management system currently, with the adopting of technology modern knowledge delivery techniques, educational programs can be tailored made to the end users, the students.

Most of the public universities in Malaysia offers blended learning environment through their learning management system. Despite almost all public universities in Malaysia has it owns learning management system, the usage of the system as a teaching and learning tools are still not encouraging or not up to institutions expectations as shown in survey report by Asirvatham et al. (2005).

In their study of e-learning in Malaysia HEIs (total of 30 HEIs), Embi, et al. (2011) has listed down 117 key findings on the basis of the analysis made on the views of 1,635 lecturers, 6,301 students and 26 e-learning administrators of Malaysia HEIs. Below are some key findings taken from the study:

(a)   All HEIs (100%) had set-up their own e-learning portal, learning management system or LMS.

(b)   Half of the HEIs (50%) have been using their LMS for more than three years, 30% have been using it for between one to three years, and 19.2% have been using for less than a year.

(c)   A total of 38.5% have e-learning policies. Which means that the majority (61.5%) do not have e-learning policies yet.

(d)   In general, support from management, faculty/school/department, and students are at the level of 76% to 100%, while support from the lecturers is at the level of 25% to 50%. This shows that the support from the lecturers is less than other stakeholders.

(e)   Most of the lecturers and students were of the opinion that all the major features found in their LMS are working well.

(f)   All HEIs (100%) conduct e-learning training for their academic staff in their respective institutions.

(g)   Most of the lecturers (77.3%) indicated that training was effective or very effective.

(h)   In terms of applying knowledge and skills learned during training, most of the lecturers (72.6%) indicated that they have successfully applied it in their teaching. A small proportion (14.6%) of lecturers believed that they managed to apply all that they have learned, while 12.8% indicated that they could not apply what they have learned during the e-learning training.

(i)   Most of the lecturers (93.4%) surveyed believe that the integration of e-learning in their courses have been beneficial to students.

(j)   Most of the lecturers (88.5%) surveyed also believe that there are positive correlation within the use of e-learning and the performance of their students.

According to Mathieson (1991), the systems that are not used are useless systems, even though the system can provide many features and functions. A success of e-learning information system depends on a lot of factors, which will eventually increase users' CI and drive the usage towards it.

1.2 Research Problems

Measuring factors affecting adoption of e-learning has been the established objective of many papers which have approached different methodologies. In the field of e-learning, researchers al over the world has brought up and discussed about attitude from different perspectives.

Previous researches on e-learning in the context of Malaysian universities were focusing more on students' acceptance of e-learning as a learning tool (Maslin, Othman, & Rosdina, 2007; Ramayah, Ahmad, & Lo, 2010). Some studies evaluate the implementation of e-learning in private and public universities in Malaysia (Raja Hussain, 2004; Puteh & Hussin, 2007; Puteh, 2007; Goi & Ng, 2009).

Although there were qualitative study on factors influencing instructor's adoption of e-learning (Puteh, 2007; Hasbollah & Md. Idris, 2009), there is minimal comprehensive quantitative research on factors which influence adoption of e-learning by instructors in Malaysia HEIs.

Recently, there is a comprehensive study on the status, trends, and challenges of implementing e-learning in HEIs conducted and funded by Ministry of Higher Education (Embi, et al., 2011) but it did not study the effects of these factors has on instructors in e-learning adoption in HEIs.

With the new delivery methods of e-learning system in education, we could use Technology Acceptance Model (TAM) in predicting instructors' acceptance of an IT or IS system. In a lot of studies in this area, TAM has been found to be vigorous and generous model (Cheung & Huang, 2005; Drennan, Kennedy & Pisarksi, 2005; Liaw & Huang, 2003).

Some major information system research with a variety of theoretical perspective (e.g. TAM) has identified some antecedents that affect the usage of information technology (IT) and individual users' adoption (Taylor & Todd, 1995 ; Chau, 2001; Dishaw & Strong, 1999). However, these researchers studied the factors that initially influence users to adopt a new technology, it did not study the factors why users continue with an technology adoption (Bhattacherjee A. , 2001; Limayem, Hirt, & Cheung, 2007).

This study attempt to extend these efforts by using TAM and Post Acceptance Model of IS-Continuance Theory (Expectation-Confirmation Model) that was developed specially to study the behavior in technology usage, and to understand the factors that support or restrain the adoption of e-learning and how these factors actually affects instructors CI on e-learning adoption with extended TAM as the research framework.

1.3 Research Objectives

It is significant to understand the factors that influence or affect the continuance adoption of e-learning by instructors in Malaysia HEIs. With this, the purpose of this study is to investigate the key factors affecting CI in e-learning adoption by instructors in e-learning contexts with the TAM and post acceptance model of IS-continuance Theory. Besides, it is the objective of this study to investigate the success factors that affect continuance adoption of e-learning, and to investigate the relationship between independent variables with dependent variables. Table 1 shows the specific objectives of this study.

Table 1.1 *Research Objectives*

Research Objectives	
(a)	To investigate the relationship between perceived usefulness and continuance intention in e-learning adoption.
(b)	To investigate the relationship between perceived ease of use and perceived usefulness to in e-learning adoption.
(c)	To investigate the relationship between perceived ease of use and continuance intention in e-learning adoption.
(d)	To investigate the relationship between perceived ease of use and continuance intention in e-learning adoption.
(e)	To investigate the relationship between confirmation and satisfaction in e-learning adoption.
(f)	To investigate the relationship between system quality and satisfaction in e-learning adoption.
(g)	To investigate the relationship between system quality and Perceived usefulness in e-learning adoption.
(h)	To investigate the relationship between system quality and perceived ease of use in e-learning adoption.
(i)	To investigate the relationship between training and perceived usefulness in e-learning adoption.

(j)	To investigate the relationship between training and perceived ease of use in e-learning adoption.
(k)	To investigate the relationship between cognitive absorption and perceived usefulness in e-learning adoption.
(l)	To investigate the relationship between cognitive absorption and perceived ease of use in e-learning adoption.
(m)	To investigate the relationship between habit and perceived usefulness in e-learning adoption.
(n)	To investigate the relationship between habit and perceived ease of use in e-learning adoption.
(o)	To investigate the relationship between intrinsic motivation and perceived usefulness in e-learning adoption.
(p)	To investigate the relationship between intrinsic motivation and perceived ease of use in e-learning adoption.
(q)	To investigate the relationship between intrinsic motivation and continuance intention in e-learning adoption.
(r)	To investigate the relationship between computer self-efficacy and perceived ease of use in e-learning adoption.
(s)	To investigate the relationship between facilitating conditions and perceived usefulness in e-learning adoption.
(t)	To investigate the relationship between perceived usefulness and satisfaction in e-learning adoption.
(u)	To investigate the relationship between perceived ease of use and satisfaction in e-learning adoption.
(v)	To investigate the relationship between satisfaction and continuance intention in e-learning adoption.
(w)	To investigate the relationship between subjective norm and perceived usefulness in e-learning adoption.
(x)	To investigate the relationship between subjective norm and continuance intention in e-learning adoption.

1.4 Research Questions

To understand the problem statement, this study attempt to address the following research questions as shown in Table 1.2.

Table 1.2 *Research Questions*

	Research Questions
(a)	Does perceived usefulness influence continuance intention in e-learning adoption?
(b)	Does perceived ease of use influence perceived usefulness in e-learning adoption?
(c)	Does perceived ease of use influence continuance intention in e-learning adoption?
(d)	Does confirmation influence perceived usefulness in e-learning adoption?
(e)	Does confirmation influence satisfaction in e-learning adoption?
(f)	Does system quality influence satisfaction in e-learning adoption?
(g)	Does system quality influence perceived ease of use in e-learning adoption?
(h)	Does system quality influence perceived usefulness in e-learning adoption?
(i)	Does training influence perceived usefulness in e-learning adoption?
(j)	Does training influence perceived ease of use in e-learning adoption?
(k)	Does cognitive absorption influence perceived usefulness in e-learning adoption?
(l)	Does cognitive absorption influence perceived ease of use in e-learning adoption?
(m)	Does habit influence continuance intention in e-learning adoption?
(n)	Does habit influence perceived usefulness in e-learning adoption?

(o)	Does intrinsic motivation influence perceived usefulness in e-learning adoption?
(p)	Does intrinsic motivation influence perceived ease of use in e-learning adoption?
(q)	Does intrinsic motivation influence continuance intention in e-learning adoption?
(r)	Does computer self-efficacy influence perceived ease of use in e-learning adoption?
(s)	Does subjective norm influence perceived usefulness in e-learning adoption?
(t)	Does subjective norm influence continuance intention in e-learning adoption?

1.5 Scope of research

Based on the objectives described above, this study wish to examine the factors that will affecting CI on adoptions of e-learning by instructors in HEIs Malaysia. Data will be collected from instructors who are currently using the e-learning system as part of their teaching tools in voluntary setting. This study only looks at public universities in Malaysia and is not taking distance education programme into consideration. This is because in distance educational programme, e-learning system is their teaching tools and it is in mandatory setting. List of Public HEIs in Malaysia is thoroughly listed in Table 1.3 below.

Table 1.3 *Lists of Public HEIs in Malaysia*

Name of Public HEIs in Malaysia (Official name in Malay Language)	Acronym	Main Campus Location
Universiti Malaya	UM	Kuala Lumpur
Universiti Sains Malaysia	USM	Gelugor, Penang
Universiti Kebangsaan Malaysia	UKM	Banagi, Selangor
Universiti Putra Malaysia	UPM	Serdang, Selangor
Universiti Teknologi Malaysia	UTM	Skudai, Johor
Universiti Utara Malaysia	UUM	Sintok, Kedah
Universiti Islam Antarabangsa Malaysia	UIAM	Gombak, Selangor
Universiti Malaysia Sarawak	UNIMAS	Kota Samarahan, Sarawak
Universiti Malaysia Sabah	UMS	Kota Kinabalu, Sabah
Universiti Perguruan Sultan Idris	UPSI	Tanjung Malim, Perak
Universiti Teknologi Mara	UiTM	Shah Alam, Selangor
Universiti Sultan Zainal Abidin	UniSZA	Kuala Terengganu, Terengganu
Universiti Malaysia Terengganu	UMT	Kuala Terengganu, Terengganu
Universiti Sains Islam Malaysia	USIM	Nilai, Negeri Sembilan
Universiti Tun Hussein Onn Malaysia	UTHM	Batu Pahat, Johor
Universiti Teknikal Malaysia Melaka	UTeM	Durian Tunggal, Malacca
Universiti Malaysia Pahang	UMP	Kuantan, Pahang
Universiti Malaysia Perlis	UniMAP	Arau, Perlis
Universiti Malaysia Kelantan	UMK	Pengkalan Chepa, Kelantan
Universiti Pertahanan Nasional Malaysia	UPNM	Kuala Lumpur

1.6 Significance of Study

While there are effort in promoting e-learning to different levels and users, the CI in system usage is still very low and not up o expectation (Chin, Sun, et al., 2007). According to Mathieson (1991), the systems that are not used are useless systems, even though the system can provide many features and functions. The phenomenon of discontinuation always happen (Roca, Chiu, & Martinez, 2006). Although the success of e-learning is depending on the initial acceptance of it, however continued usage

determines the actual success. Therefore, this study of the factors that are affecting CI in e-learning is very meaningful for stakeholders involved.

The findings from this research can be use as a guideline for stakeholders, policy makers, management to improve their performance by strategize their e-learning implementation plan and to plan out appropriate actions and enforcing positive culture to increase the continued usage. It is also can be used as a benchmark for relevant parties to track the efficiencies and effectiveness of e-learning as part of teaching tools. Retention of current adopters is important. The findings can serve as guidelines in order to increase e-learning continued adopters and thus increase the quality of e-learning in HEIs Malaysia.

On a broader aspect, the findings from this study can provide with useful information to IT practitioners, such as content publishers and online service providers, in better understanding of users needs and on how to increase customer retention and CI in using their products and services. Bhattacherjee (2001) suggested that service provider should mange users' satisfaction, which is one of the very important factor that influence continued IT usage, thus to retain customers and generate profits.

As there are limited studies that have been conducted in Malaysia, especially quantitative research in continued usage of e-learning, the empirical evidence that this study could provide will be useful to identify the critical factors that enable and e-learning CI of instructors.

This study will provide more insights to assist in strategic decision and planning and thus improve the usage and effectiveness of e-learning delivery in future. Recommendation may be made for future base on the findings.

1.7 Definition of Terms

There are total of thirteen variables including in this study. Constructs and definition are shown in Table 1.4 below:

Table 1.4 *Constructs and Definition of Terms*

Contructs	Definition	Source
Perceived Usefulness (PU)	The degree to which a person believes that the use of the system will enhance his or her performance.	Davis (1989)
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a particular system would be free of physical and mental effort.	Davis (1989)
Confirmation	Extent to which a product or service meets a user's expectations.	Oliver (1980)
System Quality (SQ)	The extent of which their functions help instructors conduct teaching activities and facilitate learning.	DeLone & McLean (1992)
Training	The acquisition of knowledge and skill for present tasks.	Fitzgerald (1992)
Cognitive Absorption	A state of deep involvement or holistic experience with the underlying technology.	Agarwal & Karahanna (2000)
Habit	The pattern of tendency and preference of using a specific portal in the past.	Gefern (2003)
Intrinsic Motivation (IM)	The performance of an activity for its inherent interests and enjoyment other than a separable outcome.	Deci (1972)
Computer Self-efficacy (CSE)	Individuals' beliefs with regard to their ability to use a computer in the context of IT usage.	Compeau & Higgins (1995); Compeau & Huff (1999)
Facilitating Conditions (FC)	Perceived enablers or barriers in the environment that influence a person's perception of ease or difficulty of performing a task.	Teo (2010)
Satisfaction	An affective state that is the emotional reaction to a product or a service experience.	Spreng, MacKenzie, & Olshavsky (1996)
Subjective Norms	The person's perception that most people who are important to him think he should or should not perform the behavior in question.	Fishbein & Ajzen (1975)
Continuance Intention (CI)	Online learners' intention to continue using e-learning systems to assimilate IT skills.	Mathieson (1991)

1.8 Organization of the Remaining Chapters

In Chapter 1, the current chapter, the background of this study, e-learning in Malaysia was introduced. Research problems and research questions also been discussed. This report has been organizés as follow: the next chapter, Chapter 2 reviews the relevant literatures of theories and models use in this study. Review of variables in the study also will be covered in Chapter 2. The following chapter, Chapter 3 will cover research framework, research design, methodologies used and data analysis methods. Results of data analysis will be discussed in Chapter 4 where the testing and elaboration of research hypotheses been done. Finally, Chapter 5 will bring to conclusion by discussing the implications of findings, limitations of this study and recommendation and suggestion for future research.

CHAPTER 2

# LITERATURE REVIEW

2.1 Theoretical Models

Technology Acceptance Model (TAM) (Davis, 1989), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) and Theory of Planned Behavior (TPB) (Ajzen, 1991) are among the models use to study the factors and elements influencing the acceptance of information technology (IT) and computers in organization. TRA and TPB attempt to explain and predicts individuals behavior toward IT usage in different areas and domain. TAM was adapted from TRA to explain technology usage and behavior (Davis, 1989). All these are intention-based models which study the pre-consumption or initial intention to adopt or use an new IT. Non of this model study the post-consumption or CI on an IT usage. To study on continued IT usage, Bhattacherjee (2001) proposed Post-Acceptance Model of Information System (IS)-Continuance to study on individual's CI in technology usage based on Expectation-Confirmation Model. These models are review in the following sections.

2.1.1 Technology Acceptance Model (TAM)

Adapted from Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), Davis (1989) proposed the Technology Acceptance Model (TAM) to understand and predict the usage and adoption of IT in working environment. In TAM, PU and PEOU are two main determinants of technology adoption. PU is defined as "the degree to which an individual believes that using a particular system would enhance his

or her productivity" while PEOU is defined as "the degree an individual believes that using a particular system would be free of effort" (Davis, 1989).

In TAM (Davis, 1989), attitude towards the use of a particular technology is affected by both PU and PEOU, while individuals' behavioral intention to use the technology is predicted by attitude and PU. PEOU can influence the attitude and behavioral intention towards the technology acceptance indirectly through PU. Behavioral intention is linked to subsequent adoption behavior. TAM assumes that the behavioral intention to use a particular technology is a very important factor that determines whether users will eventually use it or not. TAM also suggests that external variables intervene indirectly, affecting PU and PEOU. "Attitude" towards using technology was dropped from the TAM by Davis, Bagozzi, & Warshaw (1989) as a result a weak correlation between PU and attitude, and a strong correlation between PU and intention. The answer to further clarify was, as the technology usage was driven by the usefulness of it and not because of the attitude. The omission of attitude helps to understand the correlation between PEOU, PU and intention better. Figure 2.1 shows Davis' original version of TAM.
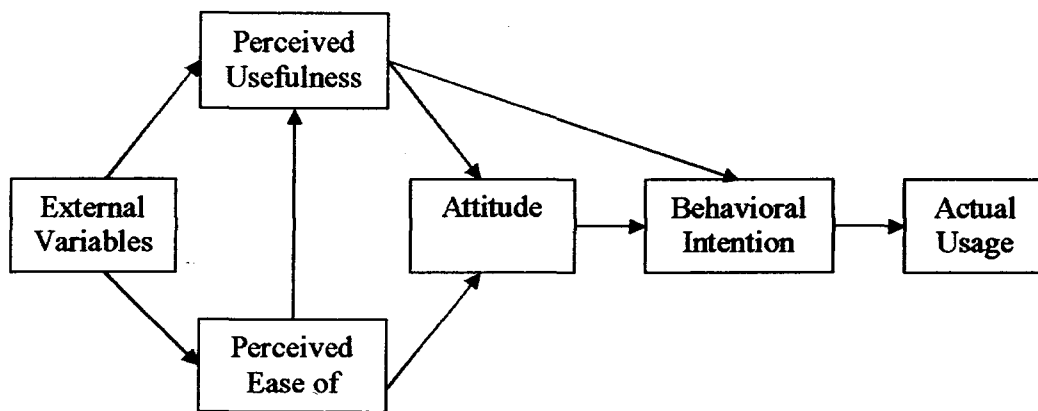
Figure 2.1 Technology Acceptance Model
(Source: Davis, 1989)

TAM has been extended by the addition of other external variables such as Internet self-efficacy (Igbaria & Livari, 1995); CSE (Compeau & Higgins1995); SN (Taylor & Todd, 1995; Venkatesh & Davis, 2000; Bhattacherjee, 2000), motivation (Davis, Bagozzi, & Warshaw, 1992 ; Lee, Cheung, & Chen, 2005).

2.1.2 Theory of Reasoned Action (TRA)

Martin Fishbein and Icek Ajzen (1975, 1980) developed the Theory of Reasons Action (TRA). It was begun as the theory of attitude and then led to the study of attitude and behavior later on.

There are three general constructs in TRA, which are behavioral intention, attitude, and SN. According to Fishbein & Ajzen (1975), attitude refers to "the degree of a person's favorable or unfavorable evaluation or appraisal of the behavior in question". Another predictor of intention is SN, which is a social factor that influence a person's believes. Each carried different weightiness and it is depend on the individual and the situation, are assumed jointly influence behavioral intention (Fishbein & Ajzen, 1975). In

TRA, accomplishing of certain behavior which influence by individual's attitude has motivation on social behavior. In short, behavioral intention in TRA were influenced by attitudes which influenced by individual beliefs. Many studies have used TRA to understand and predict health-related behaviors (Manstead, Proffitt, & Smart, 1983).
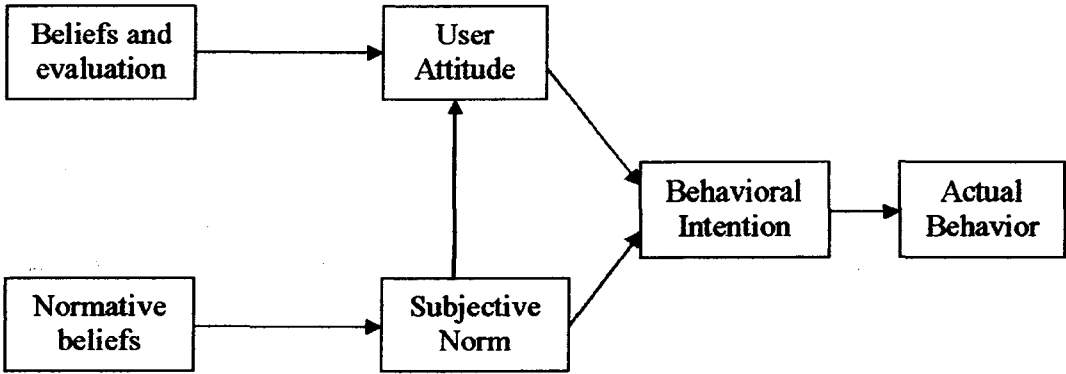

Figure 2.2 Theory of Reasoned Action
(Source: Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980)

2.1.3 Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) (Ajzen, 1985) was proposed based on Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). TPB added perceived behavioral control as the construct in addition to TRA. is use to measure for the extent to which users have complete control (internal or external) over their behavior (Ajzen, 1991). It will influence intention and actual behavior directly.

TPB is widely used to the study individual acceptance, adoption and usage IT, IS and technology. For example, Mathieson (1991) found a significant correlation within

perceived behavioral control and behavioral intention. Same results also showed in a study by Taylor and Tdd (1995).
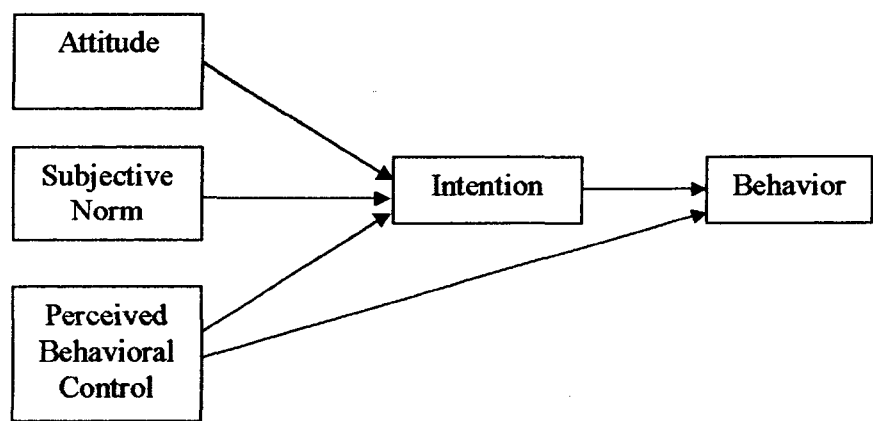
Figure 2.3 Theory of Planned Behavior
(Source: Ajzen, 1985)

2.1.4   Post-Acceptance Model of Information System (IS)-Continuance

In the field of IS research, Continuance theory were develop by Bhattacherjee (2001) based on expectation-confirmation theory (ECT) in consumer behavior (Oliver, 1980). Bhattacherjee (2001) developed a pure post-acceptance model in year 2001. This was the first study in IS CI.   Bhattacherjee (2001) combined the mixed of pre and post consumption assertion from the original ECT and converted to the new theory which was labeled IS-continuance theory.

Figure 2.4 shows the variables and relationship of the IS-Continuance theory. This model proposed the assumption that users' CI in using an IS were based on the confirmation of expectation which were formed at the initial stage of IS acceptance. At the same time, users also formed their beliefs on benefits received (PU). Both confirmation and PU formed will affect users' perceived satisfaction with the IS after a

period of use. Finally, users' willingness to continue with the use of IS were demonstrated by the PU and satisfaction. PU is the only variable that influences user intention consistently across both phases (pre and post adoption).
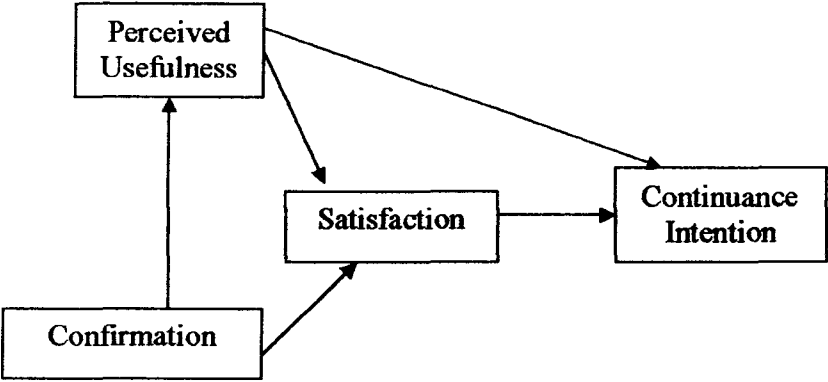

Figure 2.4 Post Acceptance Model of IS-continuance Theory
(Source: Bhattacherjee, 2001)

2.2 Research Model and Hypotheses

2.2.1 Linkages between Theories and Models

TAM was developed by Davis based on TRA. TAM and TPB has been proven in its capability to account for variance in usage intention and are almost the same among these two (Mathieson, 1991; Taylor & Todd, 1995). While TRA is more popular and famous in consumer behavior research area, TAM is a special model that widely use in technology adoption to understand IT adoption and usage (Ajzen & Fishbein, 1980; Gefen & Straub, 2000; Gefen, 2003). In a lot of studies in this area, TAM has been found to be a vigorous and generous model (Cheung & Huang, 2005; Drennan, Kennedy & Pisarksi, 2005; Liaw & Huang, 2003; Mathieson, 1991) and this make it suitable to use in different situations.

Thus, it is argued that TAM will also be useful in the understanding and explaining factors affecting adoption of e-learning by instructors in Higher Education Institutions (HEIs) Malaysia.

On the other hand, formulation of Post acceptance Model of IS-Continuance Theory is similar to the formulation of TAM by Davis et al. The model adapts from ECT and TAM adapted from TRA. ECT is a in the field of consumer behavior literature whereas TAM was from the social psychology literature. Prior studies found that the users' expectations have positive correlation with satisfaction (Oliver & DeSarbo, 1988). The higher the users' expectations, the higher the users' satisfaction. Furthermore, PU has consistently found to be the most influential factor in affecting users' intentions in IT adoption (Davis, Bagozzi, & Warshaw, 1989). Thus, it is posits that users' PU of an IT has a positive influence on their CI in driving technology usage.

This study combine TAM with Post Acceptance Model of IS-Continuance Theory to explain users' CI in e-learning adoption. Although ECM was found to be a vigorous model to study technology continuance adoption in many previous studies (Bhattacherjee, 2001), but it has limitation with only three variables. Thus, in order to explain behavioral intention widely, with the three variables namely satisfaction, confirmation, and post-adoption expectations, it is found to be imadequate in providing clear understanding in technology continunce adoption. Reviews found that there are other factors which may affects behavioral intention, for example SNs (Fishbein & Ajzen, 1975). Besides, the need to study on continued usage lso been pointed out by many researchers round the world (Bhattacherjee, 2001; Limayem & Hirt, 2003). TAM is an intention-based model which study initial intention and do not look into the post-acceptance which Post

Acceptance Model do. To increase and drive usage of IT, continuance usage is important. Thus, it is argued that the combination of TAM and Post Acceptance Model of IS-Continuance will be useful in the predicting and explaining factors affecting continuance adoption of e-learning by instructors in Higher Education Institutions (HEIs) Malaysia.

2.2.2 Extended TAM for E-learning System

Legris, Ingham, & Collerette (2003) disclosed that there is a need to add in other variables into the model to give a wider view and provide a better understanding of technology adoption. Other variables such as CSE (Compeau & Higgins, 1995), Internet self-efficacy (Igbaria & Livari, 1995), SN (Taylor and Todd, 1995; Venkatesh & Davis, 2000), perceived enjoyment (Davis, Bagozzi, 1992; Lee, Cheung, & Chen, 2005) and so on has been added into TAM before. According to Mathieson (1991), TAM is useful in predicting technology adoption but its does not give adequate explanation to understand and it does not give enough information in creation of user acceptance for new system due to its generality.

"Attitude" as a variable was dropped from the TAM by Davis, Bagozzi, & Warshaw (1989). This was explained as the technology usage was driven by the usefulness of it and not because of the attitude toward using. This assist in better understanding of the effect of PEOU and PU has on intention.

In measuring users' information satisfaction, Bailey and Pearson (1983) proposed some tools in IS domain which includes six aspects of IS success. System and information quality, individual and organizational impacts, and user satisfaction are among the aspects proposed but it was not empirically tested. They suggested that System