

READINESS FRAMEWORK FOR E-LEARNING IMPLEMENTATION: A
STUDY OF THE PERCEPTION OF LECTURERS IN THE HIGHER
EDUCATIONAL INSTITUTIONS IN SRI LANKA

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RANGKAKERJA KESEDIAAN PELAKSANAAN E-PEMBELAJARAN:
KAJIAN PERSEPSI AKADEMIK DI INSTITUSI PENGAJIAN
TINGGI DI SRI LANKA

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DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

07 May 2018

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ABSTRACT

E-learning, a popular approach to teaching and learning in most of the higher educational institutions (HEI) around the world, is seen as an alternative education method giving an equal opportunity to many students to learn. Due to limited infrastructure and other constraints, only a limited number of students out of those qualified in the G.C.E (Advanced Level) are given admission to universities. In this context, adoption of e-learning can provide flexibility in scheduling degree programmes and improve the use of limited resources. However, to adopt an e-learning system successfully, the HEIs should evaluate their readiness before embarking on it. However so far there is no empirical study on e-learning readiness in the context of HEI in Sri Lanka. Thus, this study was aimed at studying the readiness of e-learning implementation in higher educational institutions in Sri Lanka. On the review of the literature, five groups of readiness factors such as resources readiness, education readiness, environment readiness, human readiness, and attitude readiness were hypothesized to be significantly related with the intention to adopt e-learning, and the relationship between these readiness factors and the intention to adopt was expected to be moderated by individual characteristics as illustrated in the research framework. The preliminary studies and expert reviews were conducted to finalise the survey instrument, but to conduct field survey, quantitative research approach was deemed to be appropriate. The analysis of the responses obtained through the questionnaires from three hundred and sixty five (365) lecturers in the five universities (5) scattered in the five (5) different provinces of Sri Lanka, revealed that, all the universities are ready to adopt e-learning, but a moderate improvement in readiness factors would expedite the adoption process and it was discovered that all the conceptualized readiness factors were significant for the purpose of adopting e-learning. Further, the results showed that there were no significant differences in the e-learning readiness in terms of individual characteristics except the prior e-learning experience of lecturers. The study has contributed to theoretical, methodological, and practical perspectives. Theoretically this study has presented an empirical based framework, which included the readiness factors that are mostly applicable to the context of developing country like Sri Lanka. From methodological point of view, the survey instrument developed for the purpose of this study can further be tested in other research settings. Similarly, the instrument can practically contribute to assess individual readiness to adopt e-learning in different organizations. More importantly the study can serve as guidance for the university administrators, UGC and MOHE (Ministry of Higher Education) to develop a strategy for e-learning implementation in the future. However, the number of limitations that are implied in the study could be eliminated by expanding the study with the inclusion of other variables such as, politics, language, and ethnics and so on, along with the number of chosen respondents and universities and other educational institutions.

ABSTRAK

E-pembelajaran adalah salah satu inovasi yang paling cepat berkembang dalam sektor pendidikan hari ini. Sistem e-pembelajaran dilihat sebagai kaedah pendidikan alternatif yang memberi peluang yang sama, kepada pelajar untuk belajar dan juga memberi kelebihan kepada pelajar dan juga pensyarah kerana e-pembelajaran merupakan pendekatan popular untuk pengajaran dan pembelajaran di kebanyakan pendidikan tinggi Institusi di seluruh dunia. Setakat ini, bagi pendidikan tinggi di Sri Lanka, majoriti pelajar yang bertauliah tidak mendapat peluang untuk melanjutkan pengajian mereka di universiti. Berasaskan senario ini, kajian ini dijangka sangat penting. Walau bagaimanapun, untuk menerapkan sistem e-pembelajaran dengan jayanya, institusi pendidikan tinggi harus terlebih dahulu menilai kesediaannya sebelum melaksanakan projek e-pembelajaran tersebut. Oleh itu, kajian ini bertujuan untuk mengkaji kesediaan pelaksanaan e-pembelajaran di institusi pendidikan tinggi di Sri Lanka. Melalui kajian literatur, lima (5) kumpulan faktor kesediaan iaitu kesediaan sumber termasuk prasarana, kesediaan pendidikan, kesediaan alam sekitar, kesediaan modal insan, dan kesediaan sikap telah dihipotesiskan dan didapati mempunyai perkaitan yang signifikan dengan niat untuk mengadaptasi e-pembelajaran. Walau bagaimanapun, hubungan antara faktor kesediaan tersebut dengan niat mengadaptasi dijangka disederhanakan oleh ciri-ciri individu yang ditunjukkan dalam rangka penyelidikan. Penyelidikan ini menggabungkan antara kajian kualitatif yang mana terdiri daripada temubual pakar dan jugakajian awal temubual pensyarah dengan kajian kuantitatif yang mana didapati sangat sesuai. Maklum balas yang diperolehi melalui soal selidik daripada tiga ratus enam puluh lima (365) orang pensyarah di lima (5) buah universiti yang terdapat di lima (5) wilayah Sri Lanka yang berlainan. Kajian menunjukkan bahawa kesediaan pensyarah terhadap penggunaan e-pembelajaran adalah tinggi, dan kajian telah mendapati bahawa semua konsep faktor kesediaan adalah penting untuk tujuan mengadaptasi e-pembelajaran. Selain itu, keputusan menunjukkan bahawa tiada perbezaan yang signifikan dalam kesediaan e-pembelajaran dari segi ciri individu. Kajian ini telah menyumbang kepada tiga perspektif iaitu teoretikal, metodologi, dan praktikal. Secara teoritis kajian ini telah membentangkan rangka kerja berasaskan empirikal yang termasuk faktor kesediaan yang kebanyakannya digunakan dalam konteks negara-negara membangun seperti Sri Lanka. Dari sudut pandangan metodologi, instrumen kajian yang dibangunkan untuk tujuan kajian ini boleh diuji lagi dalam ketetapan penyelidikan lain. Begitu juga, instrumen ini dapat menyumbang secara praktikal untuk menilai kesediaan individu untuk menerima pakai e-pembelajaran dalam organisasi yang berbeza. Lebih penting lagi kajian ini dapat dijadikan sebagai panduan bagi pentadbir universiti, UGC dan MOHE untuk membangunkan strategi untuk pelaksanaan e-pembelajaran pada masa akan datang. Walau bagaimanapun, bilangan batasan yang tersirat dalam kajian itu boleh dihapuskan dengan memperluaskan kajian dengan memasukkan pembolehubah lain seperti politik, bahasa, etnik dan juga bilangan responden dan universiti terpilih dan institusi pendidikan lain.

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CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

E-learning is one of the fastest growing innovations in the education sector today. The use of electronic media and the development in the area of educational technology and information and communication technologies (ICT) have paved the way for the growth of e-learning (Contreras & Shadi 2015). A number of higher educational institutions around the world have already introduced e-learning into their curricula, and other institutions are in the process of introducing it. Nowadays, e-learning method is a widespread approach to teaching and learning in the most of the higher educational institutions in the world (Tarus, Gichoya & Muumbo 2015).

As e-learning is increasingly used by both private companies for training their employees and educational institutions for teaching their students (Hung et al. 2010), the demand for e-learning programmes offered by these institutions is increasing (Docebo 2014). Youngsters today use the Internet to share their knowledge, opinion and feelings with known and unknown people. This trend of youth creates a need for incorporating technology into education sector and has emerged one of the critical factors of technology adoption in the higher education (Osika, Johnson & Butea 2009). As a result, today's educational administrators and students pressurize lecturers to integrate technology into their instructional activities (Bennett & Bennett 2003). Therefore, implementing e-learning system in universities and educational institutions in this era is indispensable.

The term e-learning has been defined differently by many scholars, for instance, Rosenberg (2001) defined e-learning as the usage of Internet technologies to provide a wide range of solutions that enrich knowledge and performance meanwhile Davis (2001) explains e-learning as technology-enabled learning that contains various perceptions or a phenomenon of delivering instructions through technology. The broad definition given by Sambrook (2003) defines e-learning as any learning activity supported by information and communication technologies. Furthermore, e-learning is one of the innovations in Information System (IS) that empowers students who are fond of using electronic means to participate in the learning process from anywhere and at any time (Sun et al. 2008). E-learning is correctly termed as an electronically facilitated asynchronous and synchronous communications for the purpose of creating and disseminating knowledge (Clark & Mayer 2016; Garisson 2011), and this is the well-known definition that is widely accepted by educators today.

The terms - distance education, distance teaching, distance learning, online education, web-enabled education, and distributed learning are usually interchangeable (Keegan 2002). Web-based training, online learning, distributed learning, e-learning internet-based learning and net-based learning, all express each other (Urdan & Weggen 2000). E-learning is seen as a subcategory of distance learning, online learning a subcategory of e-learning and computer-based learning as a subcategory of online learning. The above explanation of these terms indicates that there is a great depth of interdependence among them.

The fast growth of Internet technologies supported the world-wide-web (WWW) to become the platform to facilitate the distance teaching and learning process (Santally, Rajabalee & Cooshna-Naik 2012). Integrating emerging educational technology into traditional learning environment may improve learning and offer many advantages, and facilitate to solve most of the problems encountered in the traditional method. One of the fundamental reasons that colleges and universities have chosen to become engaged in the e-learning programme is to provide increased access to students who might not otherwise be able to enter or complete an educational programme. Appana (2008) and Vaughan (2007) stressed that students having the time limitation, physical obstacle and social or economic constraints to enrol for on-campus

programmes consider this approach more beneficial for them. E-learning implemented for on-campus can provide flexibility in planning courses and enhance the use of limited resources such as classrooms and laboratories (Bourlova & Bullen 2005). The higher degree of recognition and usage of e-learning method can be credited for its advantages, such as accessibility, availability and flexibility.

The e-learning system which is seen as a substitute education method gives equal opportunities to many students to learn has many advantages. Because of this, many educational institutions at large are receptive to the adoption of e-learning technologies (Bates 2000; Souleles 2005). As many higher institutions believe that the adoption of online learning technology will enhance the quality of learning, it is essential to better equip learners with information technology skills that are valuable for the development of their profession, to provide broader access to education to fulfil the demand for higher education as well as to improve cost-effectiveness in the reception of education. According to Lewis (2007) implementation of e-learning offers reliable contents which might help students to address the issues of diverse teaching methods followed by lecturers. In this context, e-learning course can be defined as a self-paced learning approach which enables students to bypass the topics that they have previously studied and to learn about the new topics. E-learning materials are uploaded to the server, which enables lecturers and technical support team to conveniently update and administer the topics.

As e-learning is an alternative method that can solve many of the difficulties found in the conventional teaching and learning method, the higher education institutions around the world, having realized this importance are adopting e-learning system. However, according to Mosa, Mahrin and Ibrahīm (2016), to adopt an e-learning system successfully, the higher educational institutions should evaluate its readiness before embarking on an e-learning project. Thus, this study is aimed at studying the readiness of e-learning implementation in higher educational institutions in Sri Lanka.

1.2 PROBLEM STATEMENT

Sri Lanka is one of the developing countries in Asia and has a higher degree of literacy and a more successful policy of free education. In Sri Lanka, primary and secondary educations are free and offered to all. However, the computer literacy rate is relatively below the average of some of the developing countries in Asia. The overall computer literacy rate is 24.8%, 26.6% and 27.5% for the year 2014, 2015 and 2016 respectively (Department of Census and Statistics 2016). It can be seen from these statistics that the computer literacy has steadily increased over the years.

The introduction of ICT into its school system took more than three decades. Although a variety of efforts were instigated since 1983, the nationwide introduction of computer education to public school system gained momentum from only 1994 onwards (Liyanaage, 2007). In order to increase the students learning and quality of teaching, the government of Sri Lanka with the introduction of the National Policy on Information Technology in School Education (NPITSE) in 2001 has assisted the development, execution and provisions of IT education in schools. Ministry of Education (MOE) introduced ICT education in the secondary schools in 2002 and now it has been offering ICT as a subject for grades 10 and 11 and also a separate stream for ICT for advanced level students.

The Information and Communication Technology Agency of Sri Lanka (ICTA) has currently implemented four Distance & e-learning Centers (DeL centres). The overall objective of the DeL Centre project is to offer new information sharing and learning openings to a wide range of users in the country, through the formation of an interactive, multi-channel network linking to the existing domestic e-learning networks, and global networks for distance and e-learning, such as the Global Development Learning Network. But these centres do not have any connection with higher education. Further, the successfulness of these centres is not known yet. A variety of efforts of the government to introduce ICT as a subject into school curriculum and a separate stream in A/L helped increase the computer literacy rate and produce specialized graduates in information technology (IT). However, the higher education scenario remains more or less the same. Because no significant improvement in the enrolment to undergraduate

programmes was achieved by the introduction of ICT and other e-learning efforts. In the year 2009, only 19,650 students were enrolled in tertiary education while over 100,000 of eligible students were not given with admission to universities due to limited infrastructure and other constraints (Warnapala 2009).

As per the statistics published in the handbook of “Admission to Undergraduates Course of the Universities in Sri Lanka: Academic Year 2014/15” in the academic year 2013/14, out of 246,665 students who sat for the G.C.E Advanced Level examination, only 143,740 students satisfied the minimum requirements to enrol for undergraduate courses offered by the Sri Lankan universities. However only 25,200 (17.5%) students gained admission to various courses (UGC 2015). The regular percentage of students being admitted to university out of the eligible candidates is between 17% - 18%. The reason for the limited number of admission to the university is due to limited infrastructure capacities and other facilities in the universities. Thus, the majority of the qualified students do not get the opportunity to continue their higher studies (De Silva Lokuge 2010). The Open University of Sri Lanka (OUSL) provides open and distance learning courses which those students can enrol for, but unfortunately there is a lack of awareness on the side of students regarding the alternative mode of studies and courses offered by OUSL (Nanayakkara, Wijesuriya & Damayanthi 2006).

E-learning system which is considered as an alternative education method giving equal opportunities to many students to learn can be a better solution to the problems encountered in higher education in Sri Lanka. E-learning programmes if implemented on campus can provide flexibility in scheduling degree programmes and improve the use of limited resources such as classrooms and laboratories (Bourlova & Bullen 2005). Further, e-learning can enhance the capability and flexibility of universities by permitting universities to absorb a larger number of students, in spite of their demographical and geographical differences (King & Arnold 2012; Eynon 2008). As far as the limited e-learning facilities in few Sri Lankan universities are concerned, they are merely used for facilitating the existing traditional degree programmes and it is neither considered as an alternative way of teaching nor increasing students’ intake to the university system. But the University Grant Commission (UGC) of Sri Lanka is very much positive about the systematic execution of e-learning in universities. Universities

are autonomous entities that can choose to adopt e-learning system at least to convert the external degree programmes being delivered in distance mode that are in existence in most of the universities. Dual mode of delivery can also eradicate some of the difficulties in the traditional learning environment and pave the way for offering admission to an increased number of students. Piper (2010) pointed out that the e-learning mode offers students more access to learning material and therefore educational institutions can absorb a vast majority of students to their programmes. One of the reasons why universities have implemented e-learning programme is to offer increased access to students who may not otherwise be able to enter or complete an academic programme.

The increased acceptance of distance learning, online learning, and the advancement of e-learning mode in the technology era have altered the role of lecturers enormously. Lecturers in general, who were conventionally considered as transmitters of knowledge, are expected to play the role of a facilitator, a mentor, and what Salmon (2004) and Entonado and Díaz (2006) refer to as e-moderator. Cantoni, Cellario and Porta (2004) state that, “in e-learning, the teacher plays a new and different role. While devising a course, teachers become designers of experiences, processes and contexts for the learning activity: besides identifying the contents, they have to focus on motivations and active learning processes”. Similarly, Ncube, Dube and Ngulube (2014) established a fact that lecturers play a major part in the successful implementation of e-learning while influencing students and encouraging them to accept e-learning.

Therefore, lecturers are considered as the chief factor determining successful implementation of an e-learning programme (Scheepers 2015). In fact, lecturers play many roles in designing and implementing the e-learning programmes. According to Fathaigh (2001), there is a lack of understanding the factors that affect the involvement of lecturers who designing and implement e-learning programmes. The engagement of lecturers is a substantial access issue and is crucial to the success of e-learning programmes.

E-learning options are extensively accessible and helped a multitude of students in a number of developed nations and in few developing countries, but the pursuits of

e-learning at the higher educational institutions in Sri Lanka are still, can say, in the beginning stage. Abeysekara and Dia (2009) have stated that the case of e-learning in Sri Lanka is still considered as a new tendency for students and several universities are not so productive in employing the e-learning components in their degree programmes. The study of Padumadasa (2012) also confirms that the rates of e-learning adoption and e-learning readiness are in poor condition in Sri Lanka. But as more universities around the world have been implementing e-learning environments for their course delivery, it is critically significant to study the readiness of lecturers for the new e-learning environment (Sharma et al. 2015). Mosa, Mahrin and Ibrahim (2016) also stressed that higher educational institutions should evaluate their readiness before embarking on an e-learning programme. Because, the readiness of lecturers in using technology will ensure the success of e-learning implementation (So 2005).

There is no empirical study on readiness of implementing e-learning in the context of higher educational institutions in Sri Lanka, therefore, this study has been undertaken to study the readiness of implementing e-learning in the higher educational institutions in Sri Lanka.

1.3 RESEARCH QUESTIONS

Based on the discussion presented in the above section i.e. problem statement, the following research questions were formulated:

- a. How is the status of e-learning readiness of higher educational institutions in Sri Lanka?
- b. What are the factors that contribute to the e-learning readiness of lecturers in Sri Lankan higher educational institutions?
 - Do the organisational factors such as resources readiness, education readiness and environment readiness contribute to the e-learning readiness?
 - Do the individual factors such as human readiness and attitude readiness contribute to the e-learning readiness?
- c. Do individual characteristic such as gender, age, experiences and specialisation moderate the e-learning readiness factors on the adoption of e-learning?

- d. Are there any significant differences in the intention to adopt e-learning in terms of the individual characteristic such as gender, age, experiences and specialisation?

1.4 RESEARCH OBJECTIVES

The main focus of this research is on the factors that influence lecturers' readiness for the adoption of e-learning. Thus, the following research objectives have been formulated:

- a. To identify the level of e-learning readiness in Sri Lankan higher educational institutions.
- b. To identify the factors that contribute e-learning readiness in Sri Lankan higher educational institutions.
- c. To identify the moderating effect of individual characteristics between the readiness factors and intention to adopt e-learning.
- d. To identify the impact of individual characteristics on the intention to adopt e-learning.
- e. To design and evaluate an e-learning readiness framework suitable for higher educational institutions in Sri Lanka.

1.5 THEORETICAL FRAMEWORK

E-learning readiness has been defined by various authors with a slight difference. Lopes (2007) defined it as an ability of an individual or institution to gain benefits from the advantage of online learning whereas Kaur and Abas (2004) defined it as the stakeholder's capability to make use of electronic resources and multimedia technologies in order to enhance the quality of learning. Borotis and Poulymenakou (2004) defined e-learning readiness of an organisation that intends to adopt e-learning as "the mental or physical preparedness of an organisation for some e-learning experience or action" (p.1). Therefore e-learning readiness can broadly be defined as the awareness about, willingness to accept, and capability to implement e-learning in an institution to make use of the latest technology to deliver education to the vast majority of students.

The concept of e-learning readiness for the purpose of this study has been defined as the intention to adopt e-learning by the lecturers attached to the higher educational institutions in Sri Lanka. As Akaslan and Law (2011) mentioned that the e-learning would not bring the same result for each individual, institution or organisation. Thereby they demand to measure and evaluate the organisational and individual readiness for e-learning in order to ensure that the e-learning implementation would yield benefits for both organisation and individual. E-learning readiness is the assessment of certain organisational and individual factors that should be measured if organisations are optimistic about the success with the introduction of an e-learning approach in their organisations (Chapnick 2000; Redmon & Salopek 2000; Rosenberg, 2001).

Both organisational and individual readiness for accepting technological change are equally important for the sake of its successful implementation and its sustainability. Individual readiness for a change can be considered as the degree to which an individual perceived a change as needed and whether he or she has the capacity for it (Choi & Ruona 2011). Similarly, Jones, Jimmieson & Griffiths (2005) indicate that the individual readiness is the extent that employees have an optimistic view about the need for organisational change and the extent they believe such changes would bring positive impact for themselves and organisation. Undoubtedly, readiness is one of the prominent variables that affect individuals' acceptance and effectiveness of e-learning. Lin et al. (2016) highlighted the same in a research measuring mobile learning readiness.

Organisational change is a state where the traditional pattern is being transformed but the typical question is to know whether the organisation is capable to do so. Therefore, the organisational readiness to accept e-learning should be investigated before its implementation. Because, examining the extent to which an organisation is ready for e-learning acceptance would help developing e-learning implementation strategies in an effective way (Chapnick 2000; Urdan & Weggen 2000; Rosenberg 2000; Kaur & Abas 2004; Holsapple & Lee-Post 2006; Bates 2007 and Dang & Foster 2015). According to Engholm (2001), as there are many different factors discussed in the literature over what exactly constitutes e-learning readiness, one generally adopted an approach to measuring the e-learning readiness is the measurement

of organisational and individual factors that should play a vital role in the successful introduction of e-learning approach (Chapnick 2000; Redmon & Salopek 2000; Rosenberg 2001). Though there are many studies focused on e-learning readiness, it is difficult to choose a particular study from the literature to apply for a certain context (Demir & Yurdugül 2015).

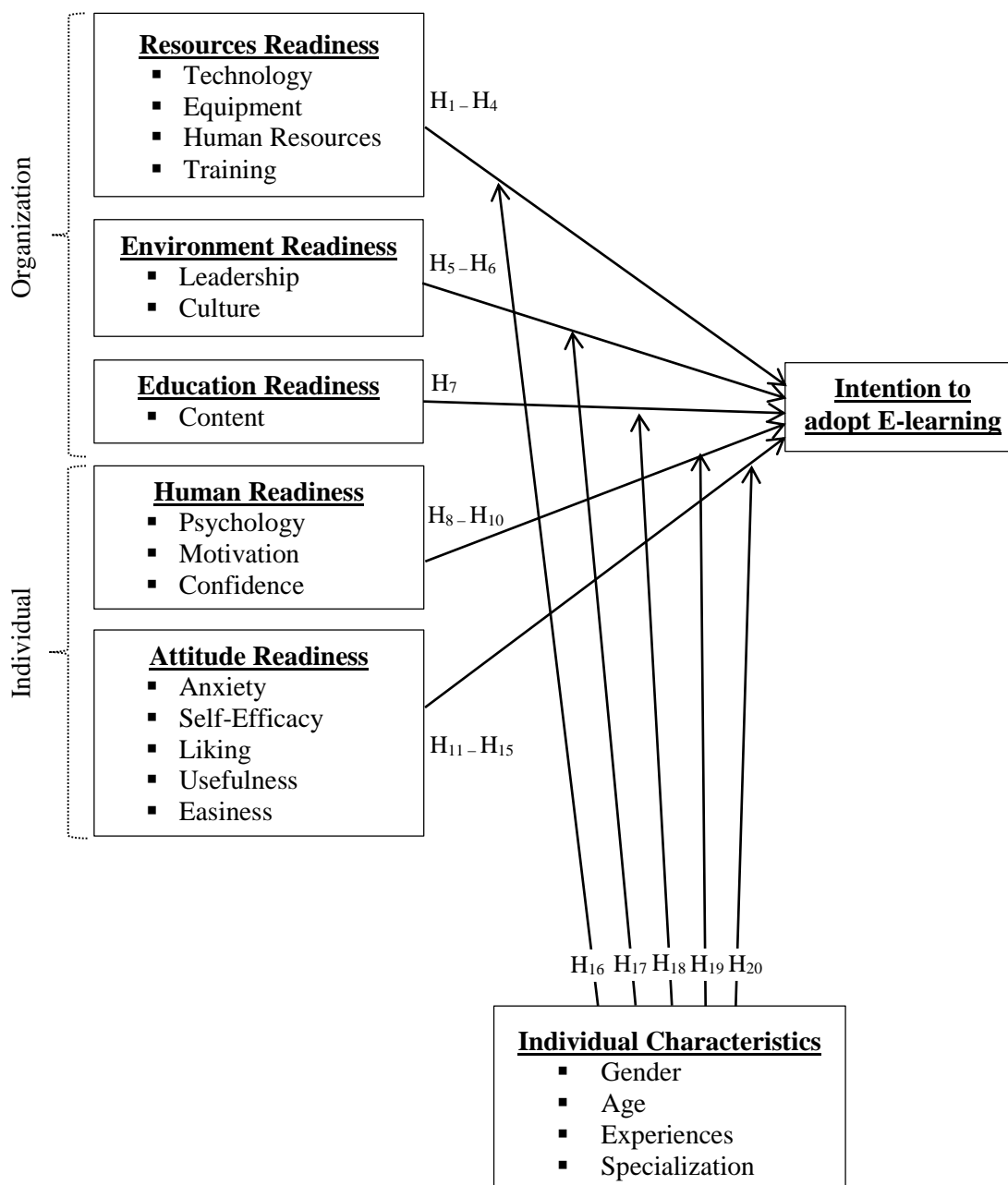


Figure 1.1 Theoretical Framework

Therefore, the theoretical framework for this study illustrated in the above figure 1.1 has been conceptualized based on a number of e-learning adoption theories and readiness models discussed here. Table 1.1 summarizes the hypotheses that have been formulated to be tested in the study.

Table 1.1 Summary of the hypotheses

No	Statement of Hypothesis
H ₁	Technology is significantly related with intention to adopt e-learning
H ₂	Equipment is significantly related with intention to adopt e-learning
H ₃	Human resource is significantly related with intention to adopt e-learning
H ₄	Training is significantly related with intention to adopt e-learning
H ₅	Leadership is significantly related with intention to adopt e-learning
H ₆	Culture is significantly related with intention to adopt e-learning
H ₇	Content is significantly related with intention to adopt e-learning
H ₈	Psychology is significantly related with intention to adopt e-learning
H ₉	Motivation is significantly related with intention to adopt e-learning
H ₁₀	Confidence is significantly related with intention to adopt e-learning
H ₁₁	Anxiety is significantly related with intention to adopt e-learning
H ₁₂	Self-efficacy is significantly related with intention to adopt e-learning
H ₁₃	Liking is significantly related with intention to adopt e-learning
H ₁₄	Usefulness is significantly related with intention to adopt e-learning
H ₁₅	Easiness is significantly related with intention to adopt e-learning
H ₁₆	The relationship between resources readiness and intention to adopt e-learning is moderated by individual characteristics (gender, age, experiences and specialisation)
H ₁₇	The relationship between environment readiness and intention to adopt e-learning is moderated by individual characteristics (gender, age, experiences and specialisation)
H ₁₈	The relationship between education readiness and intention to adopt e-learning is moderated by individual characteristics (gender, age, experiences and specialisation)
H ₁₉	The relationship between human readiness and intention to adopt e-learning is moderated by individual characteristics (gender, age, experiences and specialisation)
H ₂₀	The relationship between attitude readiness and intention to adopt e-learning is moderated by individual characteristics (gender, age, experiences and specialisation)

1.6 DEFINITION OF TERMINOLOGY

Resources Readiness: Resources readiness is referred to a variety of necessary sources that are readily available to implement e-learning in an organisation. Resources include technology, equipment, human resources and training (Psycharis 2005; Liao et al. 2014).

Technology: Technology readiness is defined as the tendency to accept and use new technology to achieve objectives in professional and personal lives (Lin & Hsieh 2012). Technological readiness is the availability of technological resources in an organisation to implement e-learning.

Equipment: Equipment readiness refers to the hardware part of e-learning i.e. physical equipment that is required to implement e-learning (Aydin & Tasci 2005).

Human Resources: Human resources readiness is regarded as the availability and design of the human supported system to establish and maintain the e-learning (Aydin & Tasci 2005; Saekow & Samson 2011; Parlakkilic 2015).

Training: Training readiness refers to the professional preparation of skills of lecturers to use tools in their organisation to help them attain a required level of knowledge or skill (Chapnick 2000).

Education Readiness: Education readiness refers to the knowledge and experience prevailing in an organisation in relation to the planning, implementation and evaluation of an educational programme (Borotis & Poulymenakou 2004).

Content: Content readiness refers to the quality and pervasiveness of online learning material that is available in various formats (Darab & Montazer 2011).

Environment Readiness: Environment readiness is referred to the broader factors that are representing the stakeholders both inside and outside the organisation (Chapnick 2000).

Leadership: Leadership is referred to the support and commitment of senior managers, administrators and the universities (Psycharis 2005; Darab & Montazer 2011).

Culture: Culture is referred to the examination of the behaviour and the attitude of the organisation and the staff in relation to e-learning implementation (Psycharis 2005).

Human Readiness: The human readiness is referred to the factors that are directly related to each individual in a situation of accepting an innovation in an organisation (Schreurs, Ehlers & Sammour 2008).

Psychology: Psychology refers the individual's state of mind as it influences the outcome of undertakings of an innovation (Chapnick 2000; Coopasami, Knight & Pete 2017).

Motivation: Motivation is referred to the force or an inner factor that induces individuals to perform a particular activity according to their interest and maintain the interest in it (Mercado 2008; Watkins, Leigh & Triner 2004).

Confidence: Confidence is referred to the belief in one's own abilities to use an innovation (McQuaid 2010).

Attitude Readiness: Attitude is referred to an individual's positive or negative feelings about carrying out the target behaviour (Ajzen & Fishbein 1980; Davis 1989).

Anxiety: Anxiety refers the sense of fear or nervousness when facing an uncertain situation or consequence (Sadik 2007; Yoo & Han 2013).

Self-efficacy: Self-efficacy refers one's belief in one's ability to succeed in specific situations or accomplish a task (Bandura 1986; Compeau & Higgins 1995a).

Liking: Liking is referred to a state or feeling of a person to accept or to perform an activity (Sadik 2007; Alothman, Robertson & Michaelson 2017).

Usefulness: Usefulness refers to the belief that using a particular system would improve his or her job performance (Davis 1989; Venkatesh et al. 2003).

Easiness: Easiness refers to the belief that using a particular system would be free of effort (Davis 1989; Venkatesh et al. 2003).

Individual Characteristics: Individual characteristics refers to the gender, age, experiences and specialisation of an individual adopting an innovation (Paraskeva, Bouta & Papagianni 2008).

Intention to adopt: Intention to adopt is referred to the willingness to accept and use an innovation (Davis 1989; Venkatesh et al. 2003).

1.7 SCOPE OF THE STUDY

This study was conducted at five universities representing all the five provinces namely Western Province, Southern Province, Northern Province, Eastern Province and Central Province. The units of analysis are lecturers attached to the universities in the above provinces. The questionnaire survey method was used for data collection. This study presents a theoretical framework that is used to identify the e-learning readiness factor appropriate to Sri Lankan Universities. In addition, this study aims to understand the relationships between the intention to adopt e-learning and organisational factors and between the intentions to adopt e-learning and individual factors. Further, this study investigated the moderating effects of the personal characteristics of the lecturers on e-learning readiness factors and intention to adopt e-learning. Though there are more factors that could be considered as independent variables in the research framework, reviewing literature limited to e-learning readiness studies and considering the contextual applicability of Sri Lankan scenario, factors such as resource readiness (technology, equipment, human resources, training); environment readiness (leadership, culture); education readiness (content); human readiness (psychology, motivation, confidence); and attitude readiness (anxiety, self-efficacy, liking, usefulness, easiness) were taken into consideration in the formation of the research framework.

1.8 SIGNIFICANCE OF THE STUDY

The study is beneficial for researchers, university administrators, University Grants Commission (UGC) and Ministry of Higher Education (MOHE) since it enriches and significantly contributes to the e-learning readiness theories, practices and implementation.

This study attempts to enhance the body of knowledge on e-learning readiness especially in the context of e-learning implementation in Sri Lanka. There are many studies on the e-learning readiness carried out in different countries in different contexts and those resulted in different models but they are lacking to be contextualized especially to the educational institutions in developing countries like Sri Lanka. This study concentrates on the development of an e-learning readiness model suitable for the institution in developing countries.

The research findings based on quantitative survey and instruments developed especially to measure the readiness of higher educational institutions in implementing e-learning are going to be a significant contribution to the literature from the perspective of methodology. Because there are a few empirical studies based on quantitative method carried out to measure the readiness of e-learning but the majority of them did not focus on lecturers' perspectives. Most of the e-learning readiness theories and models were established based on theoretical ideas and case studies.

There is no any empirical study on e-learning readiness of higher educational institutions in the context of Sri Lanka. The findings of the study are treasured greatly as they set the path for proper adoption of e-learning not only in Sri Lanka but in the developing countries having similar characteristics like Sri Lanka. The research identifies the essential readiness factors that could help to adopt e-learning in the educational institutions. Therefore, it is believed that the empirical contribution and the findings of the study can serve as guidance for university administrators, UGC and MOHE when they frame a strategy for e-learning implementation.

1.9 SUMMARY

This chapter provides an overview of the research undertaken. It introduces the concept of e-learning, scenarios of e-learning implementation and its benefits in general. The detailed problem statement presented in this chapter highlights the current situation of Sri Lanka higher education, the introduction of ICT into education, the necessity for e-learning implementation and the backdrop of undertaking the study. Consequently, research questions and research objectives were formulated. The main goal of the study is to identify the factors that influence lecturers' readiness for the adoption of e-learning. The research framework illustrating the factors to be tested in this study has been presented. The definition of the variables considered in the research framework has been briefed. In order to guide the researcher, the scope of the study has been clearly set and explained here. In addition, the significance of the study outlines the contribution the research could bring in. Subsequently, the chapters of the thesis have been organized as follows:

Chapter One: Introduction

This chapter introduces the basis for the research, includes research questions and objectives and also presents a theoretical framework to be tested in the study.

Chapter Two: Literature Review

This chapter provides a comprehensive literature review on the aspects of e-learning, e-learning adoption and readiness studies. Further it highlights the implication of the literature review to develop the theoretical framework.

Chapter Three: Research Methodology

This chapter covers the research design adopted for the study. The detail of survey instrument, measurement of the variables, preliminary studies and data collection and analysis strategy are discussed.

Chapter Four: Data Analysis and Findings

The chapter presents the various statistical techniques and results of the quantitative analyses.

Chapter Five: Discussion and Conclusion

This chapter presents a detailed discussion on the findings and concluding remarks. Further it highlights the contribution of the research as well as the limitation and direction for future research.

CHAPTER II

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides a comprehensive literature review on the research topic. The chapter has been divided into eleven sections. The first section provides an overview of the chapter. The second section elaborates the definition and the concept of e-learning whereas the third section describes the technological aspects of teaching and learning. The fourth and fifth sections detail e-learning adoption on the perception of learners and instructors, respectively. Section six highlights the status of e-learning in developing countries whereas the section seven describes the ICT in the context of Sri Lanka and focus on the status of higher education. Subsequently, the section eight and nine focused more on technology adoption theories and e-learning readiness models which helped to develop the theoretical framework for the study. The section ten encapsulates the implication of the literature reviewed for the study and the final sections summarizes the chapter.

2.2 E-LEARNING: DEFINITION AND CONCEPT

The fast growth of information and communication technology (ICT) and its doubling power made everything possible to become 'e' oriented. Czerniak et al. (1999) explained that the advent of the global electronic revolution in the 21st century have made education processes to divert from its orthodox classroom-centred focus into a vivacious web-based electronic interactive learning setting. Today all the organizations tried to innovate the way to accomplish their tasks due to the advancement of technology.

Connolly and Stansfield (2007) have recognized that e-learning has passed through three distinct generations. The first-generation e-learning was witnessed during 1994-1999, during which it was marked by a passive use of the Internet where traditional learning materials were simply converted to an online format. The changeover to higher bandwidths, vibrant streaming media, improved resources, and the transmission of creating virtual educational delivery settings, which combined accessibility to courseware, communications, and student services have been witnessed in 2000-2003 and termed as 2nd e-learning. Currently, the 3rd generation ongoing and is embarked by the integration of better associations, socialization, project oriented learning, and contemplative procedures, by means of eportfolios, wikis, blogs, social bookmarking and networking, and online simulations. Furthermore, mobile computing is increasingly influencing the third generation.

In this evolution of teaching and learning, several terms appeared to illustrate the novelty and conception are in practice, to name a few such as e-learning, distributed learning, online learning, web-based learning and distance learning and so on and different authors and researchers have also described, argued and defined these terms differently, and according to Keegan (2002) these terms are usually interchangeable. The terms web/ internet-based, online, distributed learning define themselves (Urdan & Weggen 2000). They considered e-learning as a component of distance learning, and online learning as a component of e-learning, and computer-based learning as a component online learning. Their explanation of these terms indicates that there is a great depth of interdependence among them.

The employment of Internet technologies for delivering a wide spectrum of solutions to improve knowledge and performance is known as e-learning (Rosenberg 2001). An alternative and widely accepted definition of e-learning of Sambrook (2003) indicates any learning activity supported by information and communication technologies. These definitions emphasize the activities, transforming teaching and learning process via Internet technologies and information and communication technologies. In a nutshell, it can be said e-learning is the computerization of the educational process (Phillips, Baudains & Van Keulen 2002) and the computer-based

training (CBT) is usually delivered via CD-ROM or World Wide Web (Hall 1997; Zahm 2000).

Additionally, Beamish et al. (2002) have stated that e-learning comprises a large variety of applications and processes associated with pedagogical activities, including computer-based and online education, virtual classrooms and digital association. A number of electronic technologies are used to deliver these services including the intranet, internet, smart TV and satellite. Garrison and Anderson (2002) viewed also e-learning as that learning facilitated online through network technologies. Networking facilities and the application of the Internet, Extranets, Intranets, and the World Wide Web to the teaching and learning processes are included in the definition of e-learning.

The method of getting education by means of computers coupled with Internet and Intranets is known as e-learning (Hall & Snider 2000). They further added that, e-learning encompasses web-based, online, distributed learning; whereas Urdan and Weggen (2000) described that the online learning constitutes just one part of e-learning. The same technology is also utilized at the distance learning.

The method of acquiring expertise and technical know-how from a remote area by means of different technological mediums is known as distance learning and it also seems to be a part of e-learning. Distance learning is characterized by three principles: i) a geographical distance separates communication between the trainer and the participant, ii) the communication is two ways and interactive, and iii) few kinds of technologies are employed to assist the learning process (Hall & Snider 2000).

Learning enabled by electronic devices can be totally web based, or hybrid; nevertheless, irrespective of the mode of delivery, the employment of learning technologies could possibly change the conception of educational processes by outlining the teachers' responsibilities and changing the significance and contents of the learning techniques (Anastasiades & Retalis 2001).

However, an individual might define a term of e-learning briefly, on the other hand, someone else might give a comprehensive meaning to it. The forms covering e-

learning can be the larger group of which all other terms would overlap at different times and can also be extended giving the intent of users. One more justification for this option is that, timely learning is a main benefit of e-learning, however, it is not in the case of distance learning, which reflects either courses, or practises; however, in addition to prearranged learning, e-learning also identifies the significance of the unintentional and the self-directedness of the user to enhance incidental learning to increase outcome.

2.2.1 E-learning Vs. Traditional Learning

The changeover of perception related to education and its delivery has given enormous rise to e-learning. Today almost every higher educational institution and corporate training institutes have begun to adopt towards e-learning to deliver and increase performance (Govindasamy 2002). The reasons for the adoption can be attributed to the advantages of e-learning programme such as just-in-time delivery; cost-effective ways of delivery; vast coverage and availability, the flexibility of programmes are few of them.

Guernsey (1998) noted that online courses seem to be convenience with 24 hours availability, students could retrieve courseware whenever they want, where they are and any number of times. E-learning can reach a wide spectrum of learners than any traditional education methods. It often meets the students' requirement and saves students money as well. It is also expected that the flexibility offered to learners by e-learning is crucial in addressing educational requirements of modern day students. As far as a traditional learning method is concerned, it is a lively classroom session in which physical presence of both teacher and students are required and the interaction between them is also one of the core elements of the traditional learning method whereas e-learning/distance learning is a term used to describe the different types of non-traditional learning methods. Online educationalists believe that traditional classes are inflexible. However, the conventional classroom setup encompasses benefits of permitting the student to witness their lecturers face to face and clarify their doubts immediately and relish the capability to study with others (group study).

While comparing these methods, traditional and non-traditional, educational researchers have an implicit statement that the orthodox learning method is the ideal approach of educational processes. But this assumption is rated as limiting criteria because it is very difficult to judge that one approach is better than the other devoid of any established criteria for such a determination. Saba (1998) mentioned that the researches have failed to satisfactorily describe conventional education or establish adequate distinction between the traditional education and e-learning. Therefore it has become essential to unambiguously differentiate distance and conventional types of education especially in terms of approaches, procedures, resources, purposes etc, (Ehrmann 1995). It is agreeable that it is not possible to justify the results of comparative analysis of dual mode educational processes when overlooking to consider those factors. However, the emphasis given over here is differentiate two learning modes.

With the intention of fulfilling the educational needs of the student, higher educational institutions have experimented with many different types of learning environments. The e-learning programmes are generally designed to give more flexibility and freedom for those students with some kind of constraints in attending the programmes. For instance, students who work fulltime and are geographically scattered in the far-reaching destination can be benefited by this method. It is also reported in the literature that e-learning method is a cost-effective method to serve mass students population. In the comparison study of online and traditional learning, Hannay and Newvine (2006) reported that students strongly prefer distance education largely because it allows them to balance their other commitments more easily and students also perceive that they achieve higher quality educational outcomes in the distance learning environment. E-learning gives students more opportunities to study and interact with lectures eliminating the restriction of time and place whereas the two elements, time and place are primary conditions for the traditional face to face education system. Zhang and Nunmaker (2003) described that students recognize additional prospects for communicating with facilitators in a virtual learning setting as against conventional classroom.

Astin (1993) have regarded the following as the crucial factors that fulfil the students in the traditional classroom environment: (a) time of contact with lecturers and

support staff, (b) readiness of career consultants, (c) in-campus social life and (d) general associations with lecturers and support staff. Bean and Bradley (1986) have stated that best forecasters of student satisfaction are: (a) incorporation of academics, (b) educational adequacy, (c) value and practicality of learning, (d) socializing, and (e) complication of the programme. Nevertheless, in an e-learning environment, the entire situation is not akin to that of traditional method and the new method presents diverse challenges to both facilitators and receivers.

Educationalists have categorized and elaborated the learning theories and methods based on a number of factors such learning style, the interaction between instructors, students, the process of knowledge transfer, etc., These theories are described as follow:

2.2.2 Instructivist vs. Constructivist

The traditional learning theory which is often termed as teacher-centred learning theory (“instructivist”) explains how knowledge is transferred from facilitator to receiver. Knowledge exists autonomous and peripheral to the receiver. Therefore a knowledgeable “authority” person (teacher) is needed to transfer the knowledge to the learner. According to Gardiner (1998), the theory of instructivist learning highlights the responsibility of the facilitator as a distributor of knowledge, it fairly hints to a lecture format, a monochromatic vision of knowledge (i.e., “black and white”) and a passive educational standpoint. Nevertheless, it has been presented that dynamically connecting students in dialogues raises retaining of information, use of knowledge, and improvement of critical thinking abilities, amongst 70% and 90% of instructors still use the conventional lecture as their mode of teaching (Gardiner 1998).

The instructivist learning theory has been in practice for quite a long period. That’s why numerous lecturers have employed a teacher-oriented approach in their classes and considerable present studies implicitly favours an instructivist world-view. This could furthermore describe the inclination of conventional students to reveal reliant (passive) learning styles (Grasha 1996). In many cases, teachers teach their students as

they have been trained by their teachers (Gardiner 1998). This is one of the reasons why still teachers find it difficult to get rid of the traditional instructivist method.

There is a pattern change in the concept of adult learning, in which the teaching process has shifted as learning process (Berge & Collins 1995; Schuyler 1997). The “constructivist” learning theory affirms that the receiver gains up to date knowledge by comparing the new information with existing knowledge and experiences (Olgren 1998). In the new paradigm of constructivist theory, the teacher becomes a guide rather than a dispenser of knowledge, and students are more active in the learning experience. Berge and Collins (1995) denoted that students are the active recipient of knowledge; they are proficient in creating their own knowledge with supervision from their teachers. They might become lifelong learners as they are supported to discover the courseware essential to endure learning. Jonassen and Reeves (1996) described that since the facilitator and receiver never share a mutual set of experiences and understandings, the former need not plot their own understandings of the world on the learners.

2.2.3 Synchronous vs. Asynchronous

According to Moore and Kearsley (1996), there are three types of communications such as communication between student and contents, communication between facilitator and receiver, and communication between receiver and receiver. In the history of higher education, it is assumed that pedagogy must happen in a traditional classroom where students and teacher have face-to-face interaction in real time. Matthews (1998) described that the real-time, service-dependent, “synchronous” approach of education is regarded as catalyst for educational development, course accounting, faculty world-load, tuition and national finance structures.

A receiver might interpose the facilitator for explanation in the synchronous learning event which happens in real time. Synchronous learning is led by instructors, but it is occasionally known as distance learning, noted as online learning without the physical presence of the instructor. Web technology now allows synchronous learning at a distance. But the synchronous event is scheduled and all parties – students and teachers must be present at the same time but not necessarily to be in the same place.

Asynchronous delivery is referred to programmes that are independent of time i.e. programme is pre-recorded. Since it has been recorded, anyone can access at any time and it can be repeated as many times as required. Morrison (2003) described that the asynchronous learning is also known as online distributed learning that can be conducted everywhere and anytime it is needed. So there is no live component in the asynchronous learning system. Since the interaction between and among the lecturers and students is absence in the distance education (correspondence courses), it has been criticized, but current communication systems enable learners to share virtual (as well as physical) space, a number of the undertakings that have been consigned to the conventional classroom might currently happen by means of communications networks (Matthews 1998).

According to Clouse and Evans (2003), in order to guide the learning process, teachers can include both synchronous and asynchronous methods for lectures and discussions. Today's communication technologies can meet the challenge of pedagogical distribution to the learner via online. As Kaplan (1997) explained these approaches signify a novel and strong strength for pedagogical delivery on line. The synchronous (real-time) and asynchronous (delayed) technologies can enable communications between learners and instructors which can fulfil the needs of the learner. The following table illustrates the differences between the e-learning and traditional learning method.

Table 2.1 Comparison between E-learning and Traditional (Conventional) Learning

E-learning	Traditional Learning
Learners participate in the programme at locations remote from the instructor (anywhere)	Learners physically attend classes where it is held (particular location, face to face)
Learners follow their own time schedule in learning activities based on their individual needs (anytime, flexible)	Learners have to follow the time scheduled determined by the institution (time fixed, inflexible)
Learners can associate with multiple institutions and modes of instruction simultaneously (no limitation to the programmes)	Learners is affiliated with one institution at a time (Programme is limited)

To be continued.....

.....continuation

Educational service is handled by a number of elements (course design, development, delivery, evaluation, awarding credentials, various students services etc.)	Single institution handles the instructional activities and provides all other services needed by learners
Interaction with the instructor and other students via electronic medium.	Immediate physical interaction with instructors and other students
Vast coverage of learners scattered everywhere (virtual coverage)	It covers those only attend the class, usually, the number is limited (Physical coverage)
Learners control their own learning process (self-learning, learner-centred approach)	Instructors control the learning process. (Instructor-led or teachers-centred approach)
Rely on CD-Rom, soft copy, online material and/or any digitized form of teaching material (technology is chief)	Rely on physical and printed teaching material (no technological influence)
Active learning	Passive learning

2.3 ROLE OF TECHNOLOGY IN TEACHING AND LEARNING

E-learning is a kind of technology that facilitates teaching and learning through a computer and the web technology and a teacher and a student at two different geographical locations are bridged by e-learning system (Wani 2016). It is notable that technology has become a part and partial of our ordinary life. We would be a handicapped to accomplish some work without the technology and technological instruments. The exponential growth of technology nowadays plays a crucial role in the teaching and learning aspects as well. The history of using technology for learning is replete with promise and disappointment. In 1922, Thomas Edison predicted that the motion picture would replace textbooks (and perhaps teachers) in the classroom. The film was the first true modern learning technology.

The modern technology actually emerged during the World War II when the United States used film to train millions of service people around the world. The military training films covered topics such as personal hygiene and weapons maintenance. The success of these films and their later use through television led the military to collaborate with universities to conduct research into modern learning techniques, which led the emergence of e-learning (Allen & Seaman 2005).

E-learning has been around for decades. It has an exponential growth almost every year. Nowadays, the increasing Internet usage supports the growth in e-learning. In this information age, some factors push e-learning technologies to the foreground. These factors, enabling and pushing e-learning indicates that the future will be about acquiring and acting on knowledge-based economy today is the main purpose that contributes to the emergence of e-learning and the usage of it among universities or colleges so that students who are the future leader of the country would have the skills required in today's IT world (Zu 2001).

2.3.1 Learning Management System (LMS)

The concept of 'global village' evolved with the introduction of the latest technology in which there is no boundary. Knowingly or unknowingly, we are interconnected to and interdependent on the technology for different purposes. Educational need is also one of them. Akeroyd (2005) pointed out that greatest usage of e-learning lies in using the web technology for enabling the complete learning sequence, registration till graduation. The World Wide Web (WWW) has opened up the new dimension enabling the learners to learn online anywhere, anytime. In the era of knowledge and technology-driven world, the learning management systems are said to be merging into holistic intellectual capital systems (Nagy 2004). In fact, a Learning Management System (LMS) is a software system designed for management and tracking of the student participation in e-learning materials and in their learning plan.

Recesso (2001) stated that the Learning Management Systems (LMS) plays a pivotal part in Web-based e-learning; where the resources and students are systematically intersected. The LMS also governs resources and students and the associated processes. It monitors and controls learning the progress of students and keep track on their educational achievements. It controls and governs managerial activities. In other words, these are the fundamental characteristics of an LMS and the reasons why LMS is deployed in organizations and educational institutions. The knowledge-sharing and the learning aspect are vitally important in this knowledge society or in the knowledge economy.

According to the argument of Watson and Ahmed (2004), a number of LMS are in place and offer a large spectrum of aspects which enable e-learning. The four main features of LMS are: a) distribution of resources, b) checking the progress of learners, c) resource and student control, and d) collaborate students in pedagogical activities. A Web application of LMS helps the user to sign in and access the resources. The LMS is capable of recording the preferences of the users by tracking their activities; this recorded information is used to gauge the performance of the users. According to Watson and Ahmed (2004) generally a LMS comprises front end screen for managing users, adding/deleting new users, create hierarchical user rights.

In addition to the function of Learning Management System as the technical platform to manage, administer and track students' learning processes, it can also be considered as a tool-set for both learners and administrators. In the LMS, there are features like student-self evaluations, students' accounts for webpage publishing (posting in the forums or some blogs), and real-time interactive modules (like chat). The participants should be able to view their learning progress by themselves and should also be able to view their grades and even the highest grade in the class. Therefore the LMS helps the learners assess their learning process and modify their learning procedure/plan accordingly. On the other hand, administrators can do everything, they should be able to develop a sub-module of the whole system, should be able to delete or add, be able to assign teachers and course creators. So the Learning Management System offers these features to various stakeholders like students, teachers, course creators and administrators.

According to the Asian Development Bank Institute (ADB Institute), the following fundamental characteristics of a Learning Management System (LMS) have been listed out:

- Enables the administration, distribution and tracing of combined learning (i.e., web based and conventional classroom) for staff, stakeholders and clients.
- All units, such as HR, accounts are integrated to streamline and automate administrative and supervisory tasks.
- Support collective learning group, provide numerous platforms of learning-from self-administered projects (e-seminars and class rooms, AV contents that

could be downloaded) to prearranged classes (live-streaming) to group-study (web-forums and chatting sits).

2.3.2 Learning Content Management System (LCMS)

A Learning Content Management System (LCMS) is a system to deploy contents whereas the Learning Management System (LMS) is to automate the managerial aspect of e-learning. Though LCMS can be used in place of LMS and achieve the learning objective and the modern LMS contains the feature of LCMS and vice versa, these are two different things.

When offering e-learning courses through LCMS, it is not needed to have a pre-developed courseware. It has the feature of developing and deploying course content. For example, some training programmes have been developed on CD-ROMs, and it is planned to conduct the training programme based on the CD-ROMs, then it is just easy to include those CD-ROMs into the LMS and offer the training, but to create, store and reuse the content, a Learning Content Management System is needed. There are a number of authoring tools like Word, PowerPoint, Flash, HTML, Dreamweaver and so on with which the courseware are developed. The courseware should be considered as an object. Because the LCMS views learning components as the learning objects i.e. based on the object-oriented programming concept. So learning objects are built and all the learning objects are in the learning object repository. If everything is available in the learning object repository, theoretically any courseware can be able developed. The developed object can be fit into any system. The main difference between LMS and LCMS is that, the LMS is associated to the administration of the learning process whereas the LCMS is to develop learning objects. In case if there is a requirement to develop multiple courses using educational components and to administer online and offline educational activities, then learning management system and learning content management system are required.

2.3.3 Technology and Standards

This is the world of networking and sharing. It is, therefore, necessary to buy or deploy a Learning Management System which was developed based on various open industry standards. Because majority of these web platforms and facilities are free and fulfil standards of the World Wide Web Consortium (W3C) as follows:

- HTML, XHTML, CSS and JavaScript browser scripting language for interactivity.
- A PHP server scripting language, Apache Web server and MySQL database engine.
- Extensible Markup Language (XML) for data description, structure, store and interoperability.

The LMS is designed by using open freely available software and platforms, and norms. Shareable Content Object Reference Model (SCORM) comprises of technological policies that facilitate Web-based learning systems to identify, acquire, disseminate, recycle, and distribute educational contents homogenously. The model is a prototype that explains the means to administer, file and disseminate educational contents to facilitate effortless sharing online. The model is a unified methodological specifications, assembled by the efforts of Aviation Industry CBT (Computer-Based Training) Committee (AICC), Instructional Management Systems (IMS) and Institute of Electrical and Electronic Engineers (IEEE) to create one unified “content model” and enable the re-use of Web-based learning content across multiple environment and products (Ip & Canale 2004).

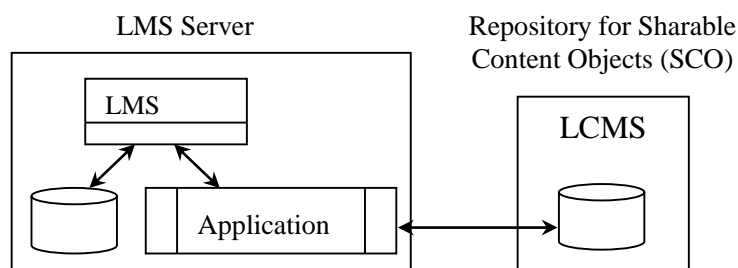


Figure 2.1 Overview of SCORM Implementation (Ip & Canale 2004)

The figure 2.1 illustrates the fundamental outline of SCORM which adopts a blend of services generally known as “LMS (Learning Management System)”, which is also known as “Learning Content Management System (LCMS)” (Ip & Canale 2004). Nevertheless in the beginning it was termed as "Computer Managed Instruction" system. The SCORM arena comprises a number of facilities that unveil educational resources, monitor the progression of users, and identify the delivery structure of educational resources and record progress of students by means of a learning experience. However, in due course SCORM has witnessed more homogeneous developments for sending and receiving of educational resources. The dual components of SCORM are:

- Content Aggregation Model (CAM) focuses on bundling educational resources to facilitate dissemination and reuse.
- Run-Time Environment is associated with the process of creating educational resources, and monitor and report the progress of users.

2.3.4 The Architecture of Learning Management System

The interconnected three layered Learning Management System (LMS) comprises: (a) the database server to save all the information and data required, comprising the method of linking to the database, (b) the Apache application server that controls the interactions (fundamental system components) and (c) the backend used by learners to retrieve data from the server (HCI that can be surfed through browsers. The advantages of LMS are listed below (Kinshuk & Yang 2003).

- Effortless amendment or substitution of any layer devoid of impacting the other layers.
- Effecting superior load balancing by isolating application and database functionalities.
- Client friendly enforcement of security policies.

The Client Tier

That is also front end, which helps the users to interact with servers. The HCI provided by the client enables the users to perform various tasks. The database will be accessed by means of a web server. To enable this access web pages are necessary, that are

created by a lot of hypertext mark-up languages (HTML) and scripting languages. The web pages can be viewed through web browsers.

The application Tier

This tier is considered as a hub that mediates the client and database server. Basically the requests sent by users will be received by this application tier and attempts to retrieve data from the database; furthermore the responses from clients will also be collected and stored in the database. Application tier offers Web services and the data streaming services are offered by this tier. Apache Web server is popular application tier. Basically, PHP, server-side scripting language will facilitate the connection to the back-end (database).

The database Tier

Generally, this is called as backend, which focuses on database. All the data necessary for web applications are stored in this tier. Data not limited to hyperlinks to courseware database will be stored in this tier, it also controls the fundamental functionalities of the system, such as database creation, managing and updating queries. Data constraints and veracity are administered and unauthorized access will be restricted. The database server also handles manifold data interfaces, views, reports and the provision of backup and recovery.

2.3.5 Commercial Product vs. Open Sources Software vs. Customized Software

Learning Management Systems (LMS) are exclusive Learning Technology Systems created with sophisticated Internet and WWW technologies so as to deliver educational services in line with the open and distance learning paradigm (IEEE LTSC 2001a; IEEE LTSC 2001b). Moore and Kearsley (1996) and Carlson (1998) have stated that, designing and implementing these kind of systems are complicated due to their complexity, whereby, diverse administrative, managerial, instructional and technological modules are to be integrated. Technology's potential lies in the extent to which it enables the creation of a learning environment grounded in constructivism (Domine 2006). The use of ICT in e-learning and other related services have gained commercial significance. There is evidence that commercially developed course

management systems can accommodate a wide variety of learning activities and perspectives.

On the other hand, today a number of open source software (OSS) are available. The open source software are available free and can be used either commercial or non-commercial purposes, without the need of buying licences. The modern LMS employ either off-shelf products (e.g. WebCT, Blackboard), or freeware (e.g. Moodle, Claroline), or personalised software systems that facilitate educational activities of a specific institute. Some educational and training institutes build or plan to build their exclusive LMS. According to Collier (2002), the personalised LMS will suit better the specific learning purposes of institutions and demonstrates to offer a worthy ROI over the years. It is also possible to customize and distribute the OSS code consistent with their specific prerequisites, however, they need to abide the accompanying license. General Public License (GUN). However, the decision whether to buy the commercial one, build the own system or adopt the freely available, depends on a number of factors such as the requirement of the institutions, organizational capacity, needs and nature of the programmes to be offered, and so on.

2.4 E-LEARNING ADOPTION – LEARNERS’ PERSPECTIVE

The popularity of E-Learning has been exponentially increasing over the years due to the massive development in the Internet and multimedia technologies. The introduction of the new learning environment in the higher education is exposed to day to day challenges due to the shift of roles and expectation among learners and facilitator (Bennett & Lockyer 2004). In addition to the design and development of an e-learning programme, the involvement of instructors and learners are the chief determinant factor of its actual implementation which leads to success or failure. Therefore the analysis of the perception of both in adopting e-learning became important.

2.4.1 Learning Style and Habit

There is a number of factors that can influence the learners’ perception on the adoption of e-learning and the factors can be perceived differently by different learners. This is

because the abilities of information processing, construction of connotation from information and application of information to the novel situation are different from learners to learners. Learning styles which describe the inclinations of students in terms of diverse learning and instructions also influence students' perception about e-learning. According to Ford and Chen (2000), the most important aspect that impacts e-learning is style of learning.

The result of the study of West et al. (2006) suggests that students who are successful in online courses study differently and employ different study habit from those students who fail. The learning strategy, study habits and frequency of contacting with instructors are main reasons for the students' success in online learning identified in their study.

2.4.2 Learners' Attitude

In the e-learning environment, the responsibility to learn relies on the learners' side, because it is self-directed learning (SDL). Therefore, students are expected to play an active role in learning but sometimes their behaviours can inhibit the learning process. Schloemer and Brennan (2006) observed during their process of developing SRL that student enthusiasm increases as they realize the impact of taking ownership of the learning process. It is clear when students realize the independent factor in e-learning and take the control over their learning process, they tend to show a positive attitude and prefer this learning mode to the traditional method. The e-learning mode is very flexible bringing a lot of advantages for those who cannot present themselves in the class and those are highest positive attitude. Drennan, Kennedy and Pisarski (2005) concluded that autonomous and innovative learning modes created positive perceptions of flexible online learning. E-learning is an autonomous and innovative learning model that can foster the positive attitude towards e-learning.

According to Liaw, Huang and Chen (2007), effective e-learning environments are affected by learner self-paced learning, multimedia instruction, and instructor-led learning. Their study also indicates that the learners have the highest positive attitude towards multimedia instruction and moderately positive attitude towards instructor-led

learning. This gives more focus on the multimedia content creation in stimulating and enticing students towards e-learning.

Lee, Hong and Ling (2001) highlighted the most significant and detrimental factors to the success of a virtual learning environment from learners' perspective are stress, association with technology use and dissatisfaction towards technology itself. They suggested the success of any virtual environment depends on the adequate skills and attitudes of learners. Developing positive attitudes towards this new learning environment is an important task for faculty members.

2.4.3 Characteristics of E-learning

Learner characteristics such as attitudes, motivation, belief and confidence should be identified in the first instance (Passerini & Granger 2000) because these are some of the factors that influence the perception of students. The effective implementation of technology regardless of its advancement and capability depends on a positive attitude towards it. On the other hand, the empirical studies (Lu, Liu & Liao 2005; Liao & Lu 2008) indicate the relationship between users' perceptions of the characteristics of web learning and their intention to use the technology. More specifically, users' perceptions of the relative advantage and compatibility of e-learning websites exhibit significant relationships with their adoption intentions. If they perceive that it would be of greater use and compatible with existing values, beliefs, experiences and needs of learners, they opt to use it.

Roblyer and Ekhaml (2000) have expressed that students perform better in online courses due to the flexibility and responsiveness experiences in online learning. They also mentioned that students' satisfaction is positively impacted when (a) the technology is transparent and functions both reliably and conveniently, (b) the course is specifically designed to support learner-centred instructional strategies and (c) the instructor's role is that of a facilitator and coach.

2.4.4 Implementation Strategy

Keller and Cernerud (2002) concluded that the implementation strategy and the differences in the implementation style are important factors in influencing students' perception than their personal characteristics. In a situation where the implementation of the new educational reforms or a new system like e-learning programme is mandatory, the implementation strategies occupy an important place rather than the individual background factors. Good strategy and implementing style will also influence the perception of students.

2.4.5 Role of Instructors

Students perceive that instructor who plays a major role in satisfying and keeping them alive online. The instructor is the main predictor of student satisfaction (Finaly-Neumann 1994; Williams & Ceci 1997). In the perception of students taking e-learning course, a personal attention of instructor is critically important for sustaining a level of satisfaction on the e-learning environment. Instructors' care on each individual student is perceived by the students taking online classes to be the most powerful determinant of their satisfaction (Eom 2006). Other factors such as instructors' knowledge, facilitation/simulation and feedback hypothesized in his research were also supported by important elements that enhance the satisfaction of the students. The findings of DeBourgh (1999) and Hiltz (1993) illustrate that student satisfaction has a strong positive correlation with the performance of the instructor, particularly with his or her availability and response time. The study of Bolliger and Martindale (2004) has yielded similar findings, indicating that the instructor variables are the most important factors that satisfy students in the online environment. Technology and interactivity are other two important factors identified as a satisfying element in their study. But Thurmond (2003) found that student satisfaction depends more on the quality and effectiveness of the instructors and the instruction than on the technology.

Moore and Kearsley (1996) mentioned three important types of interaction in distance learning courses: (a) learner-content, (b) learner-instructor, and (c) learner-learner. Instructors should facilitate all types of interactions in their distance learning

courses when possible and appropriate. Finaly-Neumann (1994) described that instructor's feedback is the important factors because the physical interaction and communication with lecturers and other students is omitted in the e-learning method. Students may feel sometimes isolation in the online teaching and get frustrated. That's why a continuous feedback and communication are required from the instructors' side.

2.5 E-LEARNING ADOPTION – INSTRUCTORS' PERSPECTIVE

Few institutes have failed to successfully adopt e-learning, due to a number of factors. Nevertheless, uprooting the orthodox educational methods is not at all an easy task, still it is crucial to do so, for the purpose of implementing novel methods of teaching. Both, teachers and students play a vital role in the successful adoption of e-learning system, where the later use the system for fulfilling their learning purposes and the former utilize it for teaching, designing and disseminating courseware, and governing and overseeing the activities of learners. To be precise, the students are front-end users and the teachers are back-end users, hence the teachers are expected to be well trained in the technological aspects of the system. Hence, it is evident that, the teachers play a very crucial role in the effective utilization of the system, it is important to note that, technology alone does not impact learning, but the instructional implementation of the technology is also considered crucial in determining the effects. Hence, the role of teachers becomes inevitable in the successful implementation of the e-learning system, as they play the most significant role in the effective utilization of the system (Collis 1995). Based on the above, it can be concluded that, the instructors are the main role players in the preliminary adoption of the system. Despite the popular belief, which claims the students as the main focus of the e-learning, it is worth mentioning that the instructors are the backbone of the system, because without their contribution in the processes such as teaching, designing and disseminating courseware, and governing and overseeing the activities of learners, the e-learning system cannot be successfully adopted and implemented.

2.5.1 Attitude and Characteristics of Instructors

Either students or instructors, attitude is one of the important factors influencing users' behavioural intention to use technology. According to Liaw, Huang and Chen (2007) when instructors exhibit more positive attitude towards e-learning, then they have more behavioural intention to use it. It gives an implication that positive attitude is more important for an effective implementation of e-learning programme and creating positive attitude among instructors is another difficult task for the implementing institution because the faculty member has to play the same role to create positive attitude among students in order to implement the system successfully.

Assertiveness towards technology, style of teaching and governance of technology are the three most important features of instructors that impact the learning outcomes (Webster & Hackely 1997). The authors have examined the role of instructors in terms of the accomplishment of learning outcomes, which in turn influence the use of e-learning system. Another study has highlighted on the development of constructive approach in terms of utilizing computers in the cyber environment as an imperative objective of the admins and educators of higher learning institutes (Lee, Hong & Ling 2001). To add on, Golden et al. (2006) have ascertained that, the use of e-learning system by instructors not just rely on their individualities, rather it is more reliant on their individual approaches and self-assurance.

Emotional, perceptive and developmental aspects constitute the attitude of the individual (Triandis 1971). Emotion or feeling is the ideal feature that incorporates favouritism or prejudice towards some matters, on the other hand, the perceptive feature denotes opinions, and the developmental feature refers to the intention of individual (Liaw 2002). The findings of Liaw, Huang and Chen (2007) describe that the apparent fulfilment of e-learning plays a crucial role in impacting the perceptions such as perceived competency and perceived practicality of e-learning; the emotional perception of instructors' is highly impacted by the multimedia based instructional feature; ultimately perceived practicality and competency are the two foremost indicators of behavioural intention to use e-learning.

The disposition of online teaching is highly affected by the attitude of instructors. The instructors have to face quite a number of challenges and make quick decisions in the domains of designing, delivering courseware, and managing course and student communication media, creating appealing learning atmosphere, valuation and the employment of novel technologies (Kosak et al. 2004). Apart from the above, the instructors also have to face another self-obstruction such as deleterious approach and conviction about the novelty of web-based teaching technique. Elimination of deleterious approach and belief about the web-based learning technique is the foremost priority of institutes while planning to implement e-learning (Pajo & Wallance 2001). The timeframe essential for getting trained in e-learning particularly in developing courses, timeframe towards utilizing and governing e-learning, and inadequate training are some other barriers associated with this new method.

2.5.2 Multifaceted Role

As it is understood, the instructors in the e-learning environment play a number of different roles than the role they played in the traditional method. Heuer and King (2004) mentioned that the online instructor holds a variety of roles and responsibilities in the virtual classroom and is multidimensional, with importance being placed on being a communicator. The major role he or she plays in the online teaching is the role of a communicator because communication is the one and only factor that keeps students active and keeps connected to each other. In case if there is any communication breaks or miscommunication, the purpose of e-learning will also miss. The expectation of students in the e-learning environment is more than the traditional students. Fulfilling the expectation is the higher target of instructors since everything is done electronically. The distance instructor should be a consultant, guide, and resource provider (Huang & Liaw 2005).

The leadership of lecturers and their assistance is a vital factor to impact learners' attitudes. In other words, the interaction between lecturers and students is a success factor for enhancing e-learning effects (Liaw, Huang & Chen 2007). They have further found in their analysis that lecturers have very optimistic perception towards

using e-learning as a tool for teaching and behavioural intention to use e-learning is influenced by perceived usefulness and self-efficacy.

2.5.3 Motivational Factors

Steel and Hudson (2001) found out that the majority of lecturers interviewed were in favour of educational technology and made it part of their own teaching and learning strategies. The lecturers perceive the additional value that technology brings to their teaching and the benefits to their students – flexibility, vocational, resource opportunities and the enrichment of learning through various media. Instructors would increase the use of technology in their teaching when they are provided with upgraded equipment, support and training (Parker, 1997).

Lack of time, lack of interest/motivation, lack of co-operation, compensation system, and quality of teaching in a virtual environment are some of the problem encountered by the lecturers (Mihhailova 2006). Preparing the e-learning courses and adjusting existing course into e-learning format while having teaching workload are mainly identified as reasons for lack of time. Though developing web-based course is time-consuming process at an initial stage, it can give a lot of relaxation in the later part. It is also perceived that there is no clear rule for measuring the work of lecturers teaching online and payment for them. The lack of motivation and interests of lecturers are attributed to the inappropriate compensation system. Further, the difficulty of measuring teaching quality in e-learning also appeared to be one of the problems identified by the lecturers.

Findings of Bongalos et al. (2006) indicate that Learning Management System (LMS), BlackBoard (BB) is a user friendly system and generally faculty member considers the courseware material developed as a complementary to their teaching modalities, however issues related to accessibility of system, technical difficulties, systemic training programmes for teachers, the attractive system of incentives and user readiness are key factors that determine the overall success of the programme and its viability. Instructors also felt that the use of courseware as an alternative mode of teaching has given them empowerment.

According to Fathaigh (2001), there are studies that indicate the ‘intrinsic motivators’ are more important than the ‘extrinsic motivators’. Interest in discovering new openings for student learning, commitment to the intellectual challenges in new methods and interest in the use of computers in teaching are recognised as intrinsic motivators, whereas monetary and personal rewards as extrinsic motivators.

2.5.4 Staff Development and Training

It is questionable here that the attitude and confidence that have been developed over the period of time in the use of the traditional system would coordinate with the roles to be played inversely in the new method. Instructors who are more comfortable and familiar with traditional methods are expected to bring significant role changes in them when implementing e-learning (Schifter 2000). Bates (1997) elucidated that there is a need for modify and rethinking their role in the open and distance education. This would be a totally new practice for the lecturers who are required to use the e-learning method. There is a need for training on how to use the system.

Prior studies have also focused on understanding the barriers or inhibitors for e-learning adoption by instructors. Infrastructure and funding are some of the barriers identified in some educational institutions in few countries (OECD 2005). The uncertainty about pedagogic value that e-learning may create and staff development are critical issues whereas staff development is one of the important factors for the sustainability of e-learning programme in higher education. However, infrastructure issues and staff training are very curial at the early stage of e-learning implementation. Schifter (2000) has also found out the factors that prevent the lecturers from taking part in e-learning programme, those are lack of technical support provided by the institutions, lack of release time, concern about the lecturers’ workload, lack of allowances for materials/expenses and concern about the quality of courses.

King (2002) recognised immediate professional training as an important factor because if they are not trained, it is difficult to keep them with new challenging technology and it is sometimes intimidating or annoying. Therefore, the professional

development is considered as an important factor to keep them alive with changing new system.

2.5.5 Experience

The study of Li and Lindner (2007) indicates that the most of the lecturers was in the early stages of Rogers' innovation-decision process and differs significantly by their area of specialisation, educational qualification, teaching experience and the experience of using distance education method. Their findings also illustrate that the increased availability of distance education technologies and web-based distance education programme do not mean an effective adoption by instructors and learners. Kammer (2015) concluded that lecturers who are new to the e-learning have ideas, desires and expectations for their teaching experience.

2.6 E-LEARNING IN DEVELOPING COUNTRIES

There are many multifaceted challenges that exist and influence against the effective diffusion and adoption of ICT in developing countries.

United Nations publishes an annual E-Government Survey Report. E-Participation Index (EPI) focuses on the use of online services to facilitate the provision of information by governments to citizens. As per the survey report of 2016 Survey, the United Kingdom (UK) is ranked as a world leader on the e-participation index while Japan and Australia acquired second place. Table 2.2 illustrates E-Participation Index (EPI) of South Asian and Southeast Asian countries.

Singapore has secured 8th position in global setting but top position among the countries in Southeast Asia and South Asia. However, India, Vietnam, Malaysia and Sri Lanka have been positioned as the Top 50 performers in e-participation in 2016. This gives an implication that they are improving their e-readiness. Most of the developing nations have endeavoured to implement e-government and e-learning nowadays.

Table 2.2 E-Participation Index (EPI)

Rank	Country	EPI
8	Singapore	0.9153
27	India	0.7627
43	Vietnam	0.6949
47	Malaysia	0.6780
50	Sri Lanka	0.6610
67	Thailand	0.5932
67	Philippines	0.5932
84	Bangladesh	0.5254
89	Nepal	0.5085
104	Afghanistan	0.4237
114	Pakistan	0.3729
114	Indonesia	0.3729
114	Brunei	0.3729
118	Bhutan	0.3559
133	Lao	0.2712
133	Timor-Leste	0.2712
146	Maldives	0.2203
170	Myanmar	0.1017
179	Cambodia	0.0678

Source: United Nations E-Government Survey 2016

A number of socio-economic characteristics and technological aspects have been taken for granted in developed nations that need to be explicitly addressed during technological transformation in developing countries. These include insufficient telecommunications infrastructure, inconsistent power supply, limited resources of the education sector, the need for basic educational facilities, and acceptable levels of student - teacher ratio. Many improvement and special interventions are required to solve the issues in adopting technology into the education sector (Uys, Nleya & Molelu 2004).

Uys, Nleya and Molelu (2004) describes management issues in the implementation of e-learning and suggests technological innovation strategies in higher education in Africa. They indicate that e-learning should be implemented within a strategically developed framework based on a clear and unified vision and a central educational rationale. Their finding further highlights the importance of using a combination of strategies, top-down, bottom-up and inside-out during the

implementation period to achieve consistency, collegiality and proprietorship. However, ICT has been recognised as a one of facilitators for improvement of access and quality of education in Namibia (Massing 2017).

E-learning in the most of the organisations surveyed in Thailand and Philippines is still in its infancy and the first stage of implementation whereas in Malaysia and Singapore, the e-learning market is more mature. The key challenges faced by the organisations in South East Asia were change management and technology. The needs for senior management support, more engaging content, more localized content and better learning management capabilities were identified under change management and the challenges associated the technology were lack of technology readily available to employees to access learning anywhere; lack of consistently reliable access to the e-learning solution, and lack of integration with other systems (Sahijwani, Sivalingam & Roza 2005).

Akbar (2005) has pointed out some major issues that should be considered for e-learning implementations in Bangladesh were a national strategy, connectivity, accreditation, acceptability, quality of the learning materials, and relevant contents. Further, he identified financial constraint is one of the limiting factors of the e-learning participation among the learners in the developing countries. In the context of e-learning readiness in Indonesia, Priyanto (2008) has identified three components that influence e-learning readiness such as resources, education and environment. Resources include technology availability (hardware and software) (technological readiness), teachers and students capability (human resources) and funding availability (economic readiness). An instructive feature includes availability of learning content (content readiness) and availability of guideline on e-learning and electronic pedagogy standardization (educational readiness). Environment factor comprises acknowledgment and appreciation of superior (leadership readiness) and cultural readiness is embedded in schedule of everyday work and institutions should encourage the lecturers by giving incentives. However, educational and environmental factors were identified as the main obstacle in implementing e-learning in Indonesia.

Many universities in Thailand have adopted ICT to support traditional classroom instruction and the government also allocates a large portion of its national budget to support the higher education. Siritongthaworn et al. (2006) inspected the approaches of e-learning usage and found that there were three main factors that influence successful e-learning implementation. Those are characteristic of the organisation, the instructors and the Internet environment. The organisational component which includes both the university policy towards e-learning and the organisation of the e-learning unit itself was the vital factor. The instructors' perceptions of the benefits of e-learning and the ease of use and Internet accessibility also contributed to implementation success. The key barrier identified is the student preference for instructor-led learning.

There are several hindrances that delay the development of ICTs in developing countries. Some of these hindrances identified by Sharma (2003) are as follows:

Infrastructural Barriers

One of the main reasons for the lower level of diffusion and use of ICT in developing countries is lack of infrastructure facilities. The Higher price of computers and lower infiltration of internet and telephones are identified as one of the main barriers to the growth of e-learning in developing countries.

Policy Planning by the Governments

The policy plan of government to use ICT in education is considered very important factors for the success. Various governments have importance to make education online. However, some of the countries in the South Asian region have not given priority to make use of ICT for the education and thus lagging behind in this area.

Political Factors

The introduction of any new technology is greatly influenced by political power. If the political leaders are in favour of the particular technology, they tend to show interest and support in its implementation.

Economic Factors

The cost associated with the implementation of ICT is another important factor that limits its growth in the developing countries. Most of the developing countries face financial constraints and depend on substantial foreign assistance to ensure the development of ICTs.

Thomas (1987) mentioned four key economic factors that might affect the adoption of ICT in a country:

- Financial strength of the society
- Attitude of policymakers
- Cost-efficiency of the technology

Some educational institutions in the developing countries acquired costly technology shutdown the system without having sufficient infrastructure to run and improper maintenance and lack of skill to run. It has been observed that developing countries often spend on the latest technologies without considering what is really needed for them. So cost-efficiency of an ICT is another chief issue that determines its growth.

Cultural Factors

There are certain context-specific and socio-cultural factors such as gender, age, caste, class, ethnicity and educational achievement that affect the access to and use of ICT. These factors should be identified and examined for the ICT based initiatives to be executed appropriately. Thomas (1987) found out that the cultural element of languages is one of the most important factors in the implementation of ICTs in developing countries. The elements of human factors like language barriers, cultural differences, gender issues and nature of society must be addressed to meet the challenge. Culture is one of the barriers in some societies to pursue higher education that can be achieved through e-learning (Aldiab et al. 2017).

Women in ICT and Barriers therein

Key barriers to the use of ICT among women in the developing countries were found to be language and insufficient education and skills, the low social status of women and professional area of women.

Nigeria, being a developing country and having an inadequate education finance policy, is highly lacking behind in the area of engineering and technological development. The low level of computer literacy; poor internet service quality, poor quality of software, software piracy and other vendor related issues; the low level of e-learning awareness; high cost of e-learning infrastructure have been identified as critical factors affecting e-learning acceptance in Nigeria (Folorunso, Ogunseye & Sharma 2006).

Currently, most of the developing countries follow the traditional instructor-centred approach due to the lack of infrastructure and the fact that the implementation and full use of e-learning environments have not yet penetrated the existing educational organisation (Iahad et al. 2004).

In order to realize the aim of e-learning as an educational tool, it is essential to accommodate the learning needs of different cultures in order to promote equitable learning outcomes for targeted students and to promote education and technological literacy that improve socio-economic opportunities in developing nations (Henning 2003; Selinger 2004).

2.7 SRI LANKAN HIGHER EDUCATION AND ICT

Sri Lanka is one of the developing countries in Asia and regarded as a nation of high resilient. The engine of growth had been the service sector (55% of GDP) where progress in telecommunication sector contributed significantly (World Bank 2005). Though the fixed line telephone growth was fairly good, its growth was not satisfactorily distributed countrywide. The fast growth of mobile network has offered a new option to a rural area. Moreover, the cost, quality and connectivity issues of these services were questionable. The literacy rate in Sri Lanka is the highest among the South Asian countries (92%) but the computer literacy rate was very low until recent time. The introduction of ICT into the school system in Sri Lanka had taken more than two decades. Even though a variety of efforts were initiated since 1983, national scale introduction of computer education to public school system gained momentum from 1994 onwards (Liyanage 2007).

With the objective of leveraging on Information and Communication Technology (ICT) for the purpose of improving public service delivery, increasing private sector competitiveness, promoting new sources of growth, accelerating social development, bridging the digital divide and supporting peace, the World Bank has provided USD 53 million for the e-development project, called e-Sri Lanka in September 2004. The Information and Communication Technology Agency of Sri Lanka (ICTA) has been responsible for facilitating the implementation of the project, consisting six components, namely (World Bank 2004):

- i. ICT policy, Leadership and Institutional Development Programme;
- ii. ICT Human Resources Development and Industry Promotion Programme;
- iii. Regional Telecommunications Network,
- iv. ICT Education and Tele-centre Development Programme;
- v. Re-engineering Government programme; and
- vi. E-society programme

Under the ICT Education and Tele-centre Development Programme, the ICTA has set up four different types of Knowledge Centres which are known as 'Nenasalas'. These knowledge centres have been categorized as such rural knowledge centres, e-libraries, distance & e-learning centres and tsunami camp computer kiosks, depending on the complexity and the type of services that will be offered.

The infrastructure, especially the Internet access in Sri Lanka is at par with other developing countries in the region. There are many ISPs in Sri Lanka, with SLT being the largest. At the last count, there were 17 active providers, with an additional 10 licenses issued. Most of these players, however, are quite small. The vast majority of subscribers are in the Colombo area, but there are points-of-presence in several other urban centres. The cost of Internet ISP access is comparable to similar services elsewhere in the world. Despite various industries in Sri Lanka making use of e-mail and the web, it is notable that virtually none of them have truly integrated it into their business (Gunawardana 2005).

Boud, Solomon and Symes (2001) identified that today Universities are under increasing pressure to reduce public expenditure and to increase the numbers and diversity of their student population. As in the case of Sri Lanka, there are a number of students who pass in the G.C.E Advanced level (A/L) examination are dropped out in admission decision by the University Grants Commission (UGC) which offers admissions to a limited number of students who get higher aggregate marks in their A/L exam. In the academic year 2013/2014, out of 143,740 students who satisfied the minimum requirement for university admission, only 25,200 students got admissions and in 2014/15, out of 149,572 students, only 25,643 got admissions (UGC 2015). The normal percentage of students being selected to university out of the eligible candidates is between 17% - 18%. The reason for the limitation can be attributed to the lack of resources and other infrastructure facilities in universities. There are 14 conventional Universities and 1 Open University to which students are allotted by the UGC. The eligible students who are unfortunate to gain internal admission to universities can get admission for some external degree programmes or apply for admissions to the Open University. However, the number of students completing their degree successfully is very minimal compared to the numbers of eligible students. Further, UGC recently passed another regulation to restrict the admission to external degree programmes based on the Z score obtained at the G.C.E Advanced Level Examination.

E-learning could be an alternative education method which would give equal opportunities to many students to learn. E-learning implemented for on-campus use provides flexibility in scheduling courses and improves the use of limited resources such as classrooms and laboratories (Bourlova & Bullen 2005). Presently a few universities offer e-learning facilities. However, its successfulness and fulfilment of its purpose are not known yet. Therefore, higher educational institutions should evaluate their readiness before embarking on an e-learning programme (Mosa, Mahrin & Ibrahim 2016). Once the e-learning system is successfully implemented in all universities, a greater number of students can be absorbed into the tertiary education programme but this situation may pose some challenges for university lecturers as they are forced to use the e-learning system.

ICTA is currently in the process of implementing four Distance & e-learning Centers (DeL centres). Two of them are located at the University of Jaffna and the South Eastern University of Sri Lanka. The DeL centre will have distance and e-learning services inclusive of all infrastructure facilities such as video conferencing room, multi-media computer laboratory and a playback room. The overall objective of the DeL Centre project is to provide new information sharing and learning opportunities to a large spectrum of users in the country, through the establishment of an interactive, multi-channel network linking to existing domestic e-learning networks, and global networks for distance and e-learning, such as the Global Development Learning Network. DeL centers aim at raising the skill levels of a broad spectrum of the population in key urban areas outside the Colombo, the capital. The initiation of the Government to implement such an island-wide e-learning programme alerts all higher learning institutions to be prepared to offer educational activities through e-learning system in the near future. So far only a few public programmes instructed by Government are coordinated through these e-learning centres.

On the actual use of e-learning, Edirippulige et al. (2006)'s study on medical students found that nearly half of the respondents (43%) stated that they were familiar with the term e-learning but only 19% stated that they had used e-learning modalities for educational purposes. The majority of respondents said that they had not used web-based learning material or multimedia resources for medical education. However, more than half of (56%) respondents agreed that e-learning would be useful tools in medical education. Despite the majority of respondents believing that e-learning modalities can be a useful tool to address some of the problems in medical education in developing countries, a lack of technology and learning opportunities have restricted the potential benefits.

While e-learning has been studied extensively in developed countries, only a few have been conducted in the context of Sri Lanka. Towards preparing the country to move towards implementing e-learning at the higher educational institutions, it is necessary to understand the factors that promote or encourage the success of e-learning.

2.8 TECHNOLOGY ADOPTION THEORIES

There are many studies have been undertaken to investigate the key factors determining the individual acceptance of technologies. Out of these empirical studies, there is a number of research models emerged such as Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), and Innovation Diffusion Theory (IDT)).

The following technology acceptance theories and models have been considered and discussed in detail. The comparison of models and their applicability in the current research scenarios have been considered for the framework development.

2.8.1 Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was introduced by Fishbein and Ajzen (1975). This theory is concerned with the determinants of consciously intended behaviours, shown in figure 2.2.

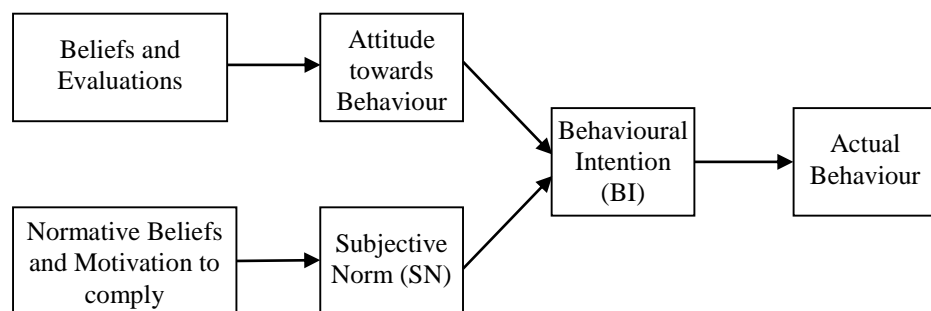


Figure 2.2 Theory of Reasoned Action (TRA)

TRA explains that a person's performance of a particular behaviour is determined by his or her behavioural intention (BI) to perform the behaviour, and BI is jointly determined by the person's attitude (A) and subjective norm (SN) concerning the behaviour in question. Attitude (A) is defined as an individual's positive or negative feelings about performing the target behaviour and the subjective norm is referred to the person's perception that most people who are important to him/her think that he/she should or should not perform the behaviour in question. A person's attitude toward a behaviour is determined by his or her salient beliefs about consequences of performing

the behaviour multiplied by the evaluations of those consequences and the individual's subjective norm (SN), the social pressure exerted on the person, is determined by multiplicative functions of his or her normative beliefs that is the perceived expectations of specific referent individuals or groups and his or her motivation to comply with these expectations. (Fishbein & Ajzen 1975). The fundamental premise of TRA is that individuals will adopt a specific behaviour if they perceive it will lead to positive outcomes (Compeau & Higgins 1995b).

2.8.2 Technology Acceptance Model (TAM)

Davis (1989) proposed the Technology Acceptance Model (TAM) to explain and predict the acceptance and use of information technology at work in 1989. It is an intention based model derived from the Theory of Reasoned Action (TRA), but tailored to meet the broad needs of information technology research and received considerable attention in the field. The model is presented in figure 2.3.

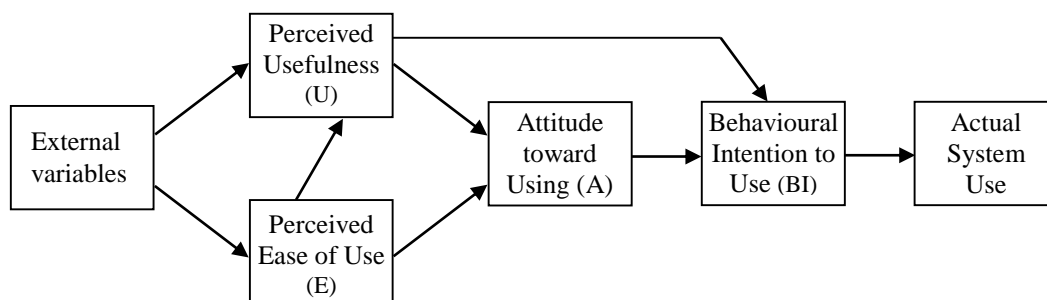


Figure 2.3 Technology Acceptance Model (TAM)

TAM proposes two particular beliefs, perceived usefulness and perceived ease of use that are the two primary drivers that determine technology acceptance. Perceived usefulness (U) is defined as the degree to which a person believes that using a particular system would enhance his/her job performance and perceived ease of use (E) is defined as the degree to which a person believes that using a particular system would be free of physical and mental effort. As per the model, both perceived usefulness (U) and perceived ease of use (E) influence the attitude of individuals towards the use of a particular technology, while attitude (A) and perceived usefulness (U) predict the individual's behavioural intention (BI) to use the technology. Perceived usefulness is also influenced by perceived ease of use (E). Perceived ease of use (E) can indirectly

affect the acceptance of technology through perceived usefulness (U), while behavioural intention (BI) is also linked to subsequent adoption behaviour. TAM also suggests that external variables intervene indirectly, influencing both perceived usefulness (U) and perceived ease of use (E) (Davis, Bagozzi & Warshaw 1989). As a result of its weak correlation with both behavioural intention (BI) and perceived usefulness (U), Attitude (A) was subsequently omitted from the model by Davis, Bagozzi and Warshaw (1989).

A fundamental hypothesis of TAM is that the effect of external variables (e.g. system characteristics, development process, and training) on the intention to use a technology is mediated by beliefs of perceived usefulness (U) and perceived ease of use (E) (Venkatesh & Davis 2000). The external factors that influence the use of the system include computer experience, computer usage and computer self-efficacy (Igarria, Iivari & Maragahh 1995; Landry 2003; Abd-Elmotaleb & Saha 2013).

Among other various models that try to exhibit the process of user acceptance of information system, TAM is one of the most cited theoretical frameworks. The result of the statistical meta-analysis of TAM applied in various fields, conducted by King and He (2006) shows that TAM to be a valid and robust model that has been widely used and potentially has wider applicability.

2.8.3 Motivational Model (MM)

Motivation has been identified as a key determinant of behaviour in a wide variety of domains (Deci & Ryan 1985). Researchers have defined and examined two broad classes of motivation (intrinsic and extrinsic motivation) across a variety of contexts and studies. Intrinsic motivation refers to the pleasure and inherent satisfaction derived from a specific activity while extrinsic motivation emphasises performing a behaviour because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity such as increased pay and improved job performance (Deci & Ryan 1985). Vallerand (1997) expressed that these two types of motivation combined in leading to the highest level of motivation. Such intrinsic and extrinsic motivation

together influences an individual's intention to perform an activity as well as actual performance (Deci & Ryan 1985).

In the context of technology, Davis, Bagozzi & Warshaw (1992) tested a motivational model of technology usage. They found that extrinsic and intrinsic motivation were key drivers of an individual's intention to perform the behaviour (i.e. technology usage). Extrinsic motivation is perceived to be instrumental in achieving valued outcomes are distinct from the activity itself such as increased pay, promotion, or improved job performance. Intrinsic motivation is the perception that user will want to perform an activity for "no apparent reinforcement other than the process of performing the activity per se" (Davis, Bagozzi & Warshaw 1992).

2.8.4 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) (Ajzen 1988 1991) is an extension of the TRA which was related to voluntary behaviour. Behaviour is not 100% voluntary and under control. Because of the limitations of TRA in dealing with behaviours over which people have incomplete volitional control, a third independent determinant of intention, perceived behaviour control (PBC) was introduced, and with this addition, the theory was called the theory of planned behaviour (TPB). TPB is a theory that predicts deliberate behaviour because behaviour can be deliberative and planned, and TPB is considered to be more general than TRA because of PCB (Chau & Hu 2002) is shown in figure 2.4.

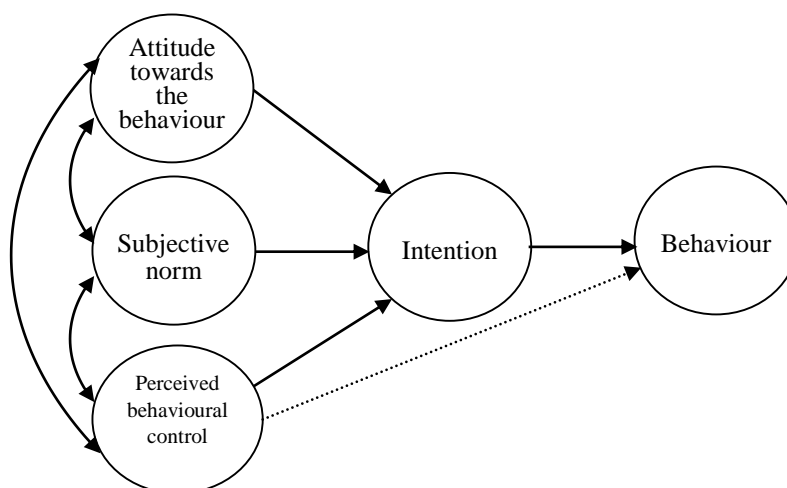


Figure 2.4 Theory of Planned Behaviour (TPB)

The intention is determined by three core constructs: (1) attitude toward the specific behaviour, (2) subjective norms (SN) and (3) perceived behavioural control (PCB) (Ajzen 1991). Perceived behavioural control refers to people's perceptions of their ability to perform a given behaviour and it influences intentions. If the attitude and subjective norm are favourable and the perceived behavioural control is greater, then the intention to perform the behaviour in question will be stronger. According to TPB, human action is guided by three kinds of considerations:

1. Behavioural beliefs - beliefs about the likely outcomes of the behaviour and the evaluations of these outcomes. These beliefs produce a favourable or unfavourable attitude toward the behaviour.
2. Normative beliefs refer to the perceived behavioural expectations of such important referent individuals or groups as the person's spouse, family, friends, and teacher, doctor, supervisor, and co-workers, depending on the population and behaviour studied. These beliefs result in perceived social pressure or subjective norm.
3. Control beliefs - beliefs about the presence of factors that may facilitate performance of the behaviour and the perceived power of these factors. These beliefs indicate whether the person feels in control of the action in question and they give rise to perceived behavioural control.

2.8.5 Combined TAM and TPB (C-TAM-TPB)

Taylor and Todd (1995) argued that TAM is unclear in predicting the behaviour of inexperienced users and explaining the determinants of IT usage is the same for experienced and inexperienced users of a system. TAM does not include the influence of social and control factors on behaviour which has been found to have a significant influence on IT usage behaviour (Compeau & Higgins 1995b; Mathieson 1991; Moore & Benbasat 1991; Taylor & Todd 1995; Thompson, Higgins & Howell 1991). These factors have been considered as key determinants of behaviour in the Theory of Planned Behaviour (Ajzen 1991). To address these issues Taylor and Todd (1995) developed an augmented version of TAM and included two factors: subjective norm and perceived

behavioural control to TAM as the important determinants of IT usage, because of their predictive utility in IT usage research and their wide use in social psychology (see figure 2.5).

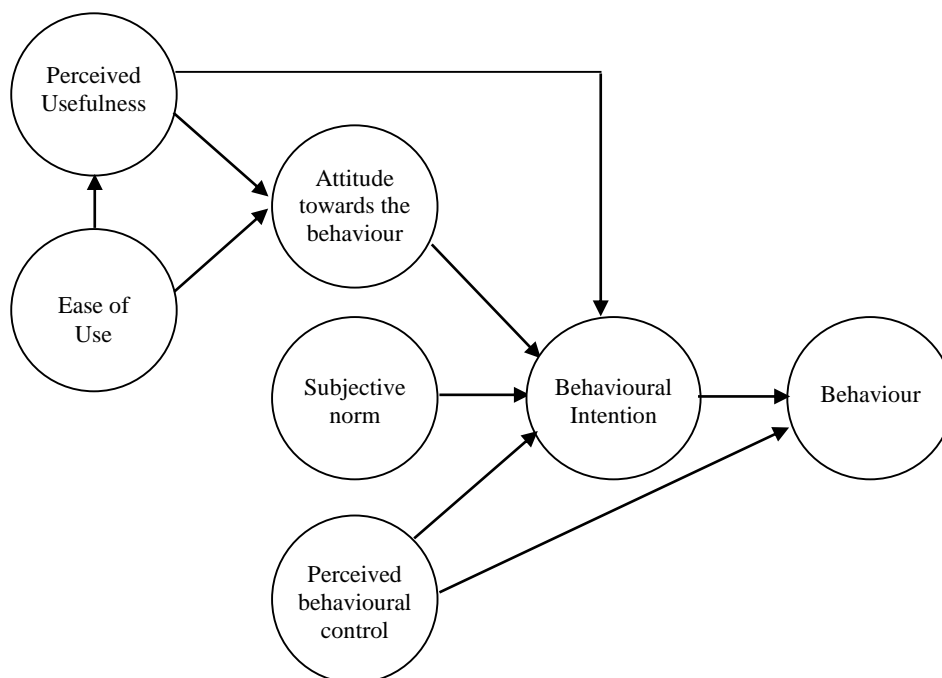


Figure 2.5 Combined TAM and TPB (C-TAM-TPB)

Taylor and Todd (1995) suggest that augmented TAM provides an adequate model of IT usage for both experienced and inexperienced users, accounting for a reasonable proportion of the variance in intention and behaviour. For both groups, all direct determinants of intention, except attitude, were significant. Therefore, the augmented TAM can be used to predict subsequent usage behaviour prior to users having any experience with a system. This suggests that this model can be used to predict usage for people who have never used the technology before as well as the capacity to predict usage for people who have used the technology or for people who are familiar with the technology. So IT usage models may be employed diagnostically prior to implementation. It also can be applied to understand the behaviour of both experienced and inexperienced users.

2.8.6 Model of PC Utilization (MPCU)

Many information systems (IS) researchers have adopted the theory of reasoned action of Fishbein and Ajzen (1975) and tested in sociological and psychological researches and found it to be lacking in a certain respect (Thompson, Higgins & Howell 1991). Triandis (1980) has proposed a theory modifying and redefining many of the same concepts and constructs. According to his argument that the behavioural intention is determined by feelings people have towards the behaviour (affect), what they think they should do (social factors) and by the expected consequences of the behaviour. Behaviour, in turn, is influenced by what people have usually done (habits), by their behavioural intentions, and by facilitating conditions.

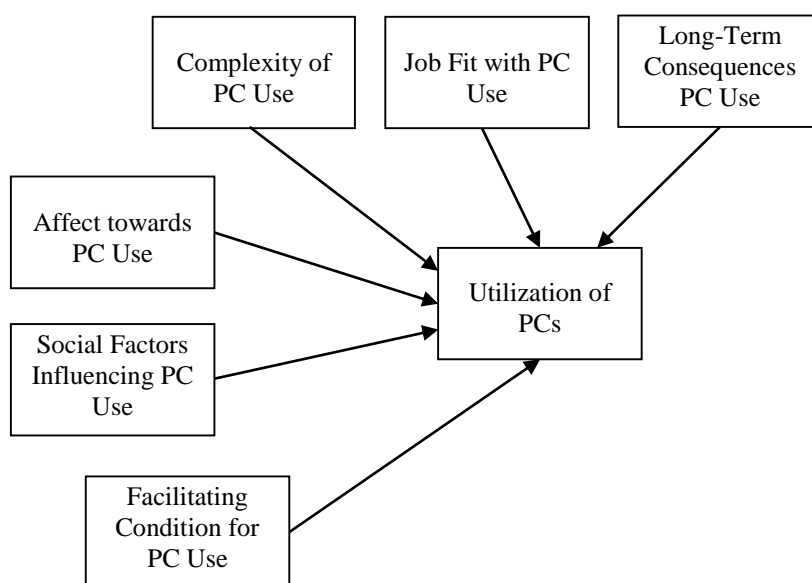


Figure 2.6 Factors influencing the utilization of Personal Computers
Source: Thompson, Higgins & Howell 1991

Since the Triandis' (1980) theory of attitudes and behaviour has not been used within the IS context, Thompson et al. (1991) adapted and refined the theory for IS context and used the model to predict PC Utilization (see figure 2.6).

Thompson, Higgins and Howell (1991) examined the direct effect of social factors, affect, perceived consequences and facilitating conditions on behaviour. Behavioural intentions were excluded from the model because it was actual behaviour (i.e., PC utilization) in which they are interested. Habits were excluded because, in the

context of PC utilization, habits (i.e., previous use) have a tautological relationship with current use.

Social factors are the individual's internalization of the reference group's subjective culture and specific interpersonal agreements that the individual had made with others, in specific social situations. *Affect toward use* is feelings of joy, elation or pleasure or depression, disgust, displeasure or hate associated with an individual with a particular act. *Long-term consequences* are the outcomes that have a payoff in the future. *Complexity* is defined as the degree to which an innovation is perceived as relatively difficult to understand and use. *Job-fit* measures the extent to which an individual believes that using a technology can enhance the performance of his or her job. *Facilitating conditions* are defined as the objective factors in the environment that observers agree to make an act easy to do (Thompson, Higgins & Howell 1991).

2.8.7 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) explores and helps to explain the adoption of an innovation. Rogers (2003) defines diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system". As expressed in this definition, innovation, communication channels, time, and social system are the four key components of the diffusion of innovations.

The first element of the diffusion of innovations process, *an innovation* is an idea, practice, or project that is perceived as new by an individual or another unit of adoption. The second element is *communication channels*. Communication is a process in which participants create and share information with one another in order to reach a mutual understanding and the channel is the means by which a message gets from the source to the receiver. The third element is the *time* aspect which is ignored in most behavioural research. The innovation-diffusion process, adopter categorization, and rate of adoptions all include a time dimension. The last element *social system* is defined as a set of interrelated units engaged in joint problem solving to accomplish a common goal. Since diffusion of innovations takes place in the social system, it is influenced by the social structure of the social system (Rogers 2003).

The innovation-decision process (see the above figure 3.6) is one through which an individual (or another decision-making unit) passes (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision. There are five functions or stages of the model (Rogers 2003).

1. Knowledge occurs when an individual is exposed to an innovation's existence and gains some understanding of how it functions.
2. Persuasion occurs when an individual forms a favourable or unfavourable attitude toward the innovation.
3. Decision occurs when an individual becomes involved in activities that lead to a decision to adopt or reject the innovation.
4. Implementation occurs when an individual puts an innovation into use.
5. Confirmation occurs when an individual seeks reinforcement for an innovation-decision already made or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation.

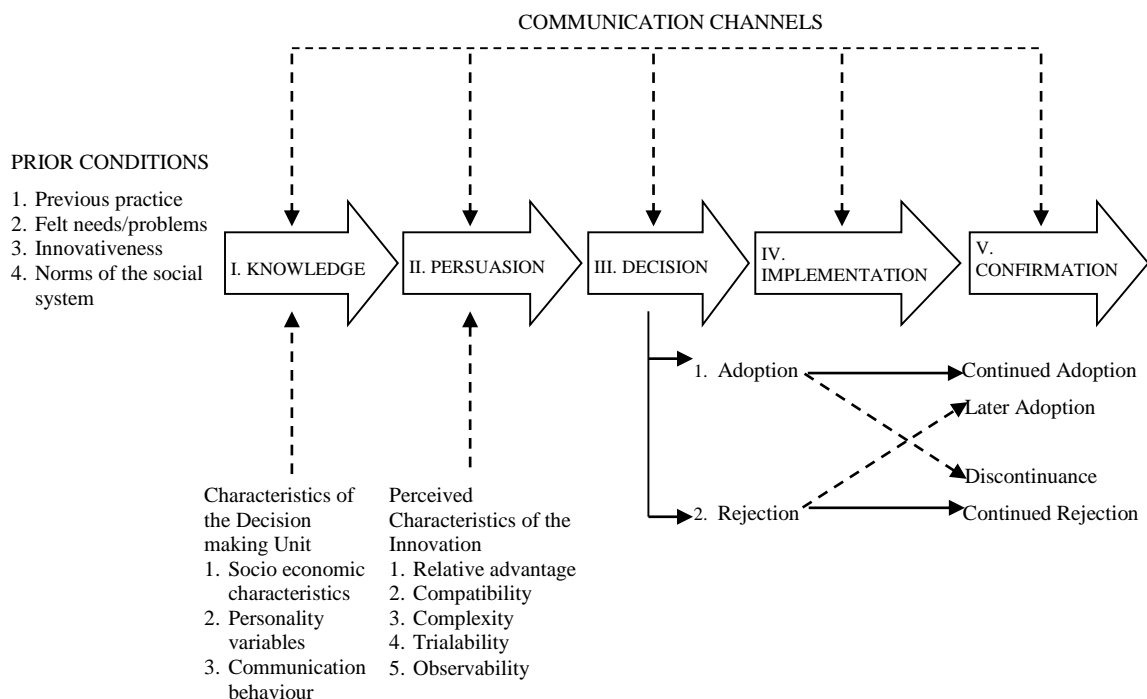


Figure 2.7 Model of Innovation Decision Process

Rogers (2003) proposes attributes of innovations that help to decrease uncertainty about the innovation. Attributes of innovations include five characteristics

of innovations: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability.

Relative advantage is defined as the degree to which an innovation is perceived as being better than the idea it supersedes. The characteristic of *compatibility* is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of the receivers. *Complexity* is the degree to which an innovation is perceived as relatively difficult to understand and use.

Trialability of an innovation is the degree to which an innovation may be experimented with on a limited basis. *Observability* is the degree to which the results of an innovation are easily seen and understood (Rogers 2003).

Moore and Benbasat (1991) identified two more constructs beyond Roger's classification to study individual technology adoption. The first one is *image*, defined as the degree to which use of innovation is perceived to enhance one's image or status in one's social system and the second one is *voluntariness of use*, defined as the degree to which use of the innovations is perceived as being voluntary, or free will. Observability has been operationalized as "result demonstrability," i.e., the ease of telling others the consequences or results of using information technology. Observability also includes visibility i.e. the degree to which the results of an innovation are visible to others.

2.8.8 Social Cognitive Theory (SCT)

Social cognitive theory of Bandura (1986) illustrated in figure 2.8 provides a framework for understanding, predicting, and changing human behaviour. The theory postulates that human functioning results from interactions among personal factors (e.g., cognitions, emotions), behaviours, and environmental conditions (Bandura, 1986, 1997). How people understand the results of their own behaviour notifies and changes their environments and the personal factors they possess which, in turn, inform and modify succeeding behaviour. The three factors, identified as the foundation of the SCT by Bandura (1986), (a) personal factors in the form of cognition, affect, and biological

events, (b) behaviour, and (c) environmental influences that constantly influence each other.

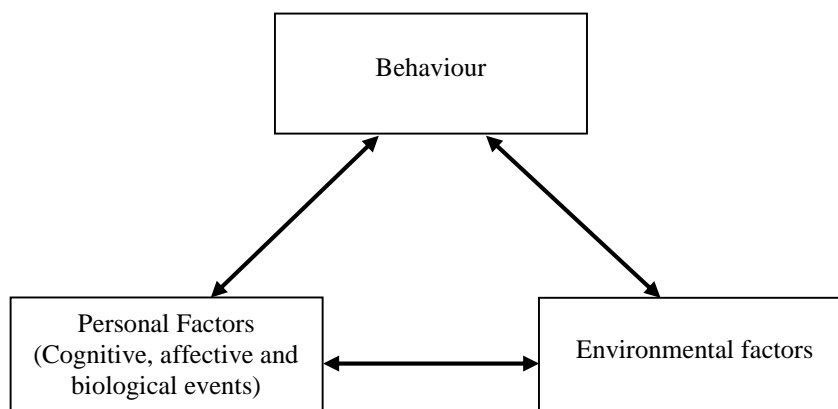


Figure 2.8 Social Cognitive Theory

Environment refers to the factors that can affect a person's behaviour. There are social and physical environments. Social environment comprises family members, friends and colleagues. The physical environment is the size of a room, the ambient temperature or the availability of certain foods. The environment offers models for behaviour. *Observational learning* happens when a person observes the actions of another person and the reinforcements that the person receives (Bandura, 1997). Bandura reformed the label of his theory from social learning to social 'cognitive' both to distance it from prevalent social learning theories of the day and to highlight that cognition plays a serious role in people's competence to construct reality, self-regulate, encrypt information, and accomplish behaviours.

Based on Bandura's social cognitive theory, Compeau and Higgins (1995b) have applied and extended theory to study individual reaction to computing technology. The model identifies the relationships between cognitive factors (self-efficacy, performance-related outcome expectations, and personal outcomes expectations), affective factors (affect and anxiety), and usage (Compeau, Higgins & Huff 1999).

Self-efficacy is defined as an individual's beliefs about his or her capabilities to use computers. *Outcome expectations*, which are defined as the perceived likely consequences of using computers, had two proportions. First one is *performance-*

related outcomes that are associated with improvements in job performance (efficiency and effectiveness) and the second one is *personal outcomes expectations* that are related to expectations of change in image or status or to expectations of rewards, such as promotions, raises, or praise. *Affect* represents the positive side i.e. the enjoyments that the person derives from using computers and anxiety represents the negative side i.e. the feelings of apprehension or anxiety that the person experiences when using computers. *Use* is defined as the degree of use of computers at work and at home.

2.8.9 Technology Acceptance Model 2 (TAM2)

TAM 2 developed by Venkatesh and Davis (2000), is an extension of TAM that explains perceived usefulness and usage intention in terms of social influence (subjective norm, voluntariness and image) and cognitive instrumental process (job relevant, output quality, result in demonstrability and perceived ease of use) (see figure 2.9).

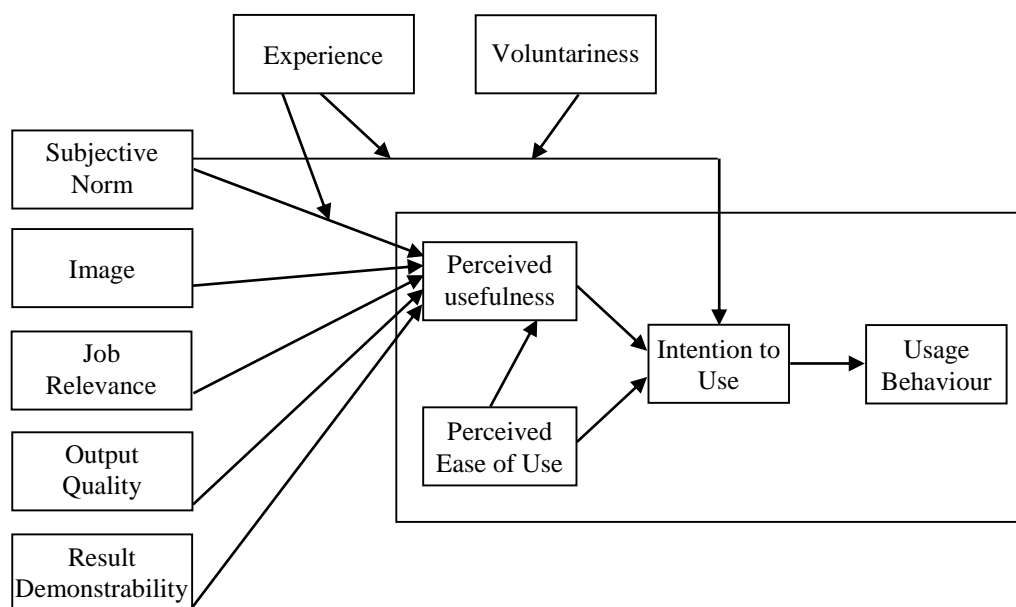


Figure 2.9 TAM2 - Extension of TAM (Venkatesh & Davis 2000)

Subjective norm which is consistent with TRA has a significant effect on intention in mandatory setting but not in voluntary setting. As a moderating variable *voluntariness* is defined as “the extent to which potential adopters perceive the adoption decision to be non-mandatory” (Agarwal & Prasad 1997; Hartwick & Barki 1994; Moore & Benbasat 1991). *Image* is defined as “the degree to which use of an innovation

is perceived to enhance one's status in one's social system" (Moore & Benbasat 1991). *Job relevance* is defined as an individual's perception regarding the degree to which the target system is applicable to his or her job. *Output quality* refers to the perception of how well the system performs the task. *Result demonstrability* is defined by Moore and Benbasat (1991) as the "tangibility of the results of using the innovation." *Perceived usefulness*, taken from TAM, is defined as the degree to which a person believes that using a specific system would improve his or her job performance (Davis, Bagozzi & Warshaw 1989).

The extended model (TAM2) was tested using longitudinal data collected from four different systems at four organisations, two involving voluntary usage and two involving mandatory usage. Both social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) potentially influenced user acceptance (Venkatesh & Davis 2000).

2.8.10 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al (2003) formulated a unified model having empirically compared the prominent eight models and their extensions which have been elucidated in the above sections and the summary of the theories has been illustrated in Table 2.3. The unified model is called the Unified Theory of Acceptance and Use of technology (UTAUT). This model that compiles all the variables associated in the eight existing models and a designated subset of additional constructs and was validated using both existing data, from the prior studies of technology adoption model, and data collected from two new surveys. The UTAUT aims to describes user intentions to use an IS and subsequent usage behaviour. The model is presented in figure 2.10. The theory was framed with four main determinants of intention and usage, and four moderators of key relationships. Three main determinants (performance expectancy, effort expectancy, and social influence) determine the behavioural intention to use technology and the other core variable (facilitating condition) directly determines the usage behaviour.