E-learning Adoption Model: A case study of Pakistan

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Abstract: The integration of information and communication technologies in the traditional educational infrastructure has restructured the knowledge sharing and transfer of knowledge. The developed countries have gained a lot of benefit in their economy by merging the ICT into their educational sector and business organizations. The e-learning system acceptance has gained enormous attention by the higher education institutions in developed countries. However, developing countries are still lacking to reap maximum benefits of the cutting-edge technology. Due to the undoubted benefits, e-learning is gaining popularity in the developing countries as well. However, developing countries are still at the rudimentary stage of e-learning adoption. By considering the limitations of the e-learning in developing countries, it seems helpful to gain insight into the technology adoption and its continued use for Pakistan. E-learning adoption and continued usage effectively improve universities teaching and learning outcomes. After critically assessing the technology adoption models, including TAM, UTAUT, DOI, Flow Theory, ECM and Model of Personal Computer Utilization, a conceptual model is built to explain the adoption and continued intention of university students in Pakistan. The conceptual model is based on TAM as it is a robust and parsimonious model. The model extends TAM by adding some critical factors which are mainly categorized into individual, organizational, system and social context of e-learning. The proposed model enables universities to evaluate student's behavioral intention towards e-learning systems. The research work contributes by providing conceptual model for adoption of e-learning by the university students of Pakistan.

Keywords: E-learning adoption, Students' behavior intention, Technology acceptance mode

1. Introduction

E-learning is one of the most promising medium of learning in information and communication technologies (ICT). E-learning has replaced the traditional face to face class room based teaching with the dynamic and nonlinear access of knowledge. Moreover, it provides inexpensive and new opportunities of collaboration and interactivity among users. E-learning can be described as "a tool to improve education using the computer network technology, usually through electronic media like internet, intranet and extranet, providing information to users irrespective of time and space limitations, also better utilization of web based communication, training, sharing and transfer of knowledge" (Cheng, 2011).

E-learning is a step towards knowledge sharing and collaboration among users to enhance their knowledge and skills in the digital era (Jan, et al., 2012). Another significant advantage of e-learning is to provide an interactive environment to users via computer technology like online discussion forums, tutorials, live streaming, online reference material, self-learning and group projects (Wu, et al., 2012; Duan, et al., 2010).

The importance of E-learning in the Higher Education (HE) is discussed by many researchers (Park, 2009; Liaw & Huang, 2013; Ferdousi &

Levy, 2010). In this regard, E-learning becomes a major tool for improving educational and training activities. In addition to this, E-learning is also used to improve the service quality of organizations as well as to reduce the training expenditure of the staff in an organization (Wu, et al., 2012). HE is trying to incorporate the e-learning components into the traditional setup of education to boost the delivery of traditional courses or to offer degree programs at distant locations (Ahmed, 2010). As a result; e-learning is growing at a surprising rate among the educational institutions.

E-learning provides a platform to the students where they can share their ideas and knowledge to their co-members and instructors as well. Importance of E-learning systems due to its interactive environment and improved collaboration are widely accepted and recognized. E-learning provides the support that fosters the learning process of the learner. Hence, it is required to increase the adoption rate of the e-learning.

The current research mainly focuses on effectively integrating the e-learning into traditional educational system and to increase the adoption rate as well as continued use among students in the developing countries like Pakistan.

2. Literature review

2.1 Technology acceptance model (TAM)

To investigate the factors affecting user acceptance rate of computer technology, two factors of computer acceptance are identified, namely perceived ease of use (PEOU) and perceived usefulness (PU) (Davis, 1989). These factors and theory of reasoned action forms the basis of TAM (Davis, et al., 1989) . The existing studies based on TAM have empirically verified two core constructs i.e. PU and PEOU that affect users' attitude and behavioral intention towards technology adoption and continued usage (Lee, et al., 2011; Li, et al., 2012; Jan & Contreras, 2011; Sánchez & Hueros, 2010).

TAM has successfully applied on different technologies (Word, Email), situation (time, culture) and diverse control factors (age, gender, and region). Moreover, prior research investigated that, without adding the appropriate external variables, the core constructs of TAM only present general information about a system. Prior researches have extended TAM by adding various external factors. External factors depends highly on the context of the environment. The contextual factors like culture, technology and community influence the adoption of e-learning. In HEIs' contextual factors may be internal (user characteristics and organizational characteristics) or external (government ICT-policies, social environment) (Khan & Nawaz, 2013). These factors can be a supportive element or may create obstacle in e-learning implementation and usage. There is not a universal model for e-learning adoption as the acceptance and refusal may depends on the contextual factors that are culturally dependent.

2.2 Adoption of e-learning in developed countries
The developed countries are gaining maximum benefit from the new technology not only in the educational sector but also in the business organizations (Hsia, et al., 2012). HE in the United States constantly offers the e-learning courses and investing resources to maintain the infrastructure of such systems (Ferdousi & Levy, 2010). With the benefits of integrating e-learning in HE, there are numerous limitations to incorporate the ICT with the traditional learning. Poor technology infrastructure, lack of business strategies, students' frustration against web based education and rapid change in the technology may cause failure to students' acceptance of technology and technology continuance (Park, 2009). In the 1990s, developed countries have paid strong attention on internet infrastructure building and particular context was included from the start. Therefore, developed countries are leading in deploying e-learning infrastructure.

2.3 Adoption of e-learning in developing countries
E-learning adoption and continuance intention is a vital issue in developing countries. E-learning presents a significant challenge to the educators and policy makers in developing countries (Bhuasiri, et al., 2012). As thinking and attitude changes with the passage of time, it takes a lot of time to merge the ICT into traditional environment of the learning. There is need to pay attention on contextual factors in developing countries to incorporate the e-learning into their educational institutions (Andersson & Grönlund, 2009). The developing countries have to plan the e-learning implementation in their true perspective.   Moreover,   user   factors   and technological aspect must be investigated to meet the required benefits of ICT. Success of E-learning system   not   only   depends   on   availability   of technology, but the social, cultural issues must be explored and examined on priority basis.   The problems arise when systems are not designed from the learners' perspective due to the differences in terms of moderating variables like age, gender and experience (Nawaz, 2013). There is a need to examine the issues and barriers in the e-learning adoption and continuance intention in developing countries.

2.4 E-learning Status in Pakistan
Since 2000, the Government of Pakistan (GOP) has realized the need of emerging new technologies with the traditional education system. In 2002, Virtual University has been established to meet the required needs of all the students within and outside the country (Qureshi, et al., 2010). In 2007, Government of Pakistan and the Ministry of Information and Technology generated a National ICT R&D Fund and invited the proposals from IT institutions and software companies to develop the e-learning and evaluation system. It is highly recommended by the Higher Education Commission of Pakistan that universities have to establish the videoconferencing   and   Learning   Management Systems in their campuses to cope with the latest educational trends. This study also investigated that the availability of personal computer, technical assistance, privacy issues and language are the major   prominent   challenges   of   implementing   e-learning in Pakistan (Qureshi, et al., 2010). Besides this, demographic and contextual factors play a moderating role for the use of e-learning in a developing country like Pakistan. There is a need to develop a customized e-learning for different group of users which is the prerequisite to flourish higher education (Nawaz & Kundi, 2010).

Developing countries' cultural, social, contextual, demographics,   government   and   organizational

policies are different from developed countries (Nawaz, 2012).

Without maintenance of software, hardware and technology support, teachers and students' intention to use new technology is compromised. Author also stated that knowledge and communication gap among users, developers and policy makers may lead to delinquent. The most challenging issue in HEIs of developing countries like Pakistan is to create the infrastructure, services and facilities at institutional level (Nawaz & Khan, 2012).

There are numerous contextual differences in developed and developing countries models that results in low quality unless contextual factors are reconsidered locally (Basar, et al., 2013).

Successful adoption of e-Learning needs to identify the relationship with the social context within which it is practically applied because the effective e-Learning model in UK may not be as successful in Pakistan (Khan, et al., 2013).

In the context of HEIs of Pakistan, another study investigated the successful integration of ICT requires the success and failure factors for technology adoption. The critical factors should be analyzed and emerge into locally developed implementation model (Nawaz, et al., 2011).

(Basar, et al., 2013) identified that lack of local research to record the users' views and their requirements in the local context. It is not imaginable to initiate the new ICTs without extensive study of the local opinion. New technology integration highly depends on technology adoption into the existing social practice, policy and purpose of the local community. However, it is highly needed to know that how to efficiently implement e-learning in the traditional educational system to boost the learning process. Consequently, it is also useful to know the factors influencing students' intention to use e-learning which ultimately enhance students' motivation about e-learning. Therefore, it is necessary to conduct such kind of research which deals more rigorously with students' adoption, intention and continued use of e-learning. In order to address the said issue, this research attempts to fill this gap in the literature by developing a conceptual model to identify the critical factors influencing students' intention to participate in e-learning systems, as well as suggesting recommendations to enhance this participation for more learning outcomes.

Above mentioned studies constantly identifying the need of the e-learning model with local contextual requirements of the developing countries like Pakistan but lacks to investigate the system usage with some of the critical factors that may affect the intention and adoption of the system.

The literature review in Table 1 gives summary of researchers' contributions towards adaptation model and external factors.

Table 1: Literature Review towards adoption model of e-learning

Authors	Factors	Adoption models	Findings
(Raaij & Schepers, 2008)	• Subjective norm • Computer anxiety • Personal innovativeness	• TAM 2	• Subjective norm impact system usage indirectly through PU • There is not a direct relationship between PU and personal innovativeness.
(Liu, 2010)	• Online posting anxiety • Wiki Self-efficacy • Perceived behavioral control	• TAM	• PU and PEOU significantly predicted wiki usage and its intention. • Wiki usage is not affected by Perceived behavioral control
(Liu, et al., 2009)	• Presentation types (text, audio, video)	• TAM • Media richness theory • Flow theory	• Presentation types in e-learning are associated with the users' intentions. • Media presentation types always cause higher level of concentration and PU.
(Jan & Contreras, 2011)	• Subjective norm • Compatibility	• TAM	• PU and Subjective norm influences the attitude. • PU and attitude influence the behavioral intention.
(Pituch & Lee, 2006)	• Self-efficacy • System	• TAM	• System characteristics signify that if system is easy to use then it reports higher intention to use the

	functionality • System interactivity • System response • Internet experience		system. • System requirements should be compatible with the user requirements prior to ensure the implementation of the e-learning in educational institutions.
(Sánchez & Hueros, 2010)	• Technical support • Computer self-efficacy	• TAM	• The results demonstrate that technical support has direct effect on PU and PEOU and indirect effect on attitude. • Universities have to recruit the trained personnel to motivate the students and teaching staff
(Park, 2009)	• Subjective norm • System accessibility • Self-efficacy	• TAM	• Self-efficacy and subjective norm affects the behavioral intention to use the e-learning system. • System accessibility as an organizational factor was not dominant construct and affects only PEOU.
(Cheng, 2011)	• Network externality factor • Social factor • System factor • Individual factor • Cognitive absorption	• Extended TAM	• System usage is affected by the individual factors. The results demonstrate that it provides better support for social factors on system usage. • PEOU, attitude and intention is positively influenced by the Network Externality
(Hsia, et al., 2012)	• Locus of control • Computer self-efficacy	• TAM	• Locus of control significantly affects PU and is significant determinant of PEOU. The results indicate that self-efficacy is affected by the PEOU and intention to use
(Li, et al., 2012)	• Service quality • Course quality • Self-efficacy • System functionality • System response • System interactivity	• TAM • IS success model • Self-efficacy theory	• The model investigates and validates the relationship between the factors like PU, PEOU, system characteristics, course and service quality, self-efficacy and e-learning system reuse
(Viswanath Venkatesh, 2008)	• Subjective norm • Computer self-efficacy • Image • Job relevance • Output quality • Result demonstrability • Computer playfulness • Computer anxiety • Perception of external control • Objective usability • Perceived enjoyment	• TAM3	• TAM3 posits the important determinants of PEOU i.e. computer anxiety, computer playfulness, self-efficacy, perceived enjoyment, objective usability and perceptions of external control • TAM3 shows that the effect of PEOU on PU is moderated by experience • Determinants of PEOU have no significant effects on PU.

3. **Proposed conceptual model of e-learning adoption in Pakistan**

External variables influence the adoption and help to better understand the technology acceptance and continued usage. The current study focuses on the

external factors of e-learning adoption and its continued use. The external factors have been segregated into four major categories like individual context, system context, social context and organizational context.

3.1 Individual context
The first category of external variables incorporated is user characteristics. All users of e-learning systems have different perception due to their different characteristics and attitude towards the same technology use. Prior research asserted that personality variables like self-efficacy (Liu, 2010; Buchanan, et al., 2013; Sánchez & Hueros, 2010; Hsia, et al., 2012; Liaw & Huang, 2013), internet experience (Pituch & Lee, 2006), computer anxiety (Raaij & Schepers, 2008; Liu, 2010), enjoyment (Venkatesh, 2000) are the most important determinant of the technology adoption and usage. In addition, student success depends on the technical ability and skills along with how the technology brings fun and bliss for them to cope with the new technology.

3.2 System context
The second category of external variables is system context. System context in terms of technology acceptance and usage has been validated by many researchers. System functionality, interactivity and response are added as system context for technology adoption (Cheng, 2011; Li, et al., 2012; Pituch & Lee, 2006). System functionality is the ability to provide the flexible access to the e-learning system.

In addition to this, another important system characteristic is interactivity. System should be interactive as the e-learning systems provide the collaboration of students with other members and faculty as well. System integrates different assessment media presentation types like audio, video, text and makes an interactive environment (Liu, et al., 2009).

3.3 Social context
The third perspective is social context. Social context means the social influence on acceptance of e-learning systems. Subjective norm is considered as the social pressure on an individual to adopt new technology (Jan & Contreras, 2011). Subjective norm affects the systems usage through perceived usefulness (Raaij & Schepers, 2008). Subjective norm is also an important predictor of usage behavior and attitude (Park, 2009). In another study, the author suggested the role of teachers, parents and other co-members is important that influence the e-portal acceptance at schools (Maldonado, et al., 2011).

3.4 Organizational context
The forth category in an e-learning system adoption is organizational context. Organization's support foster the adoption and intended use. Organizations can influence the technology adoption via system accessibility and system visibility. Higher system accessibility brings the higher use of the e-learning system in the campus by the students (Park, 2009)
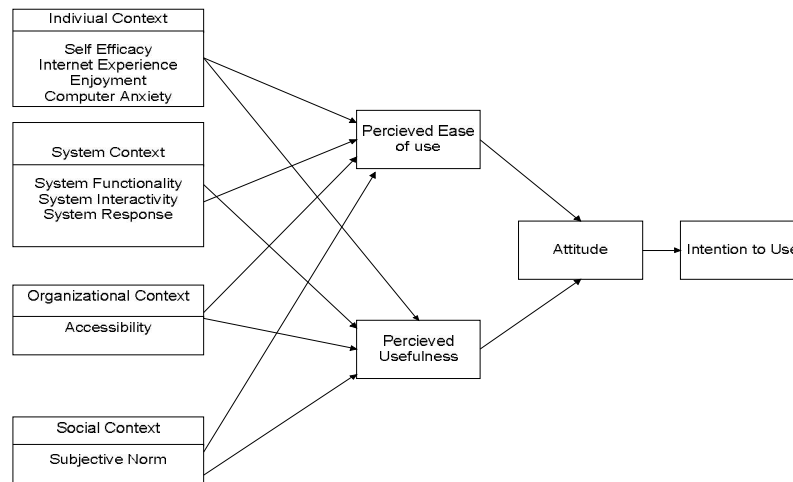
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Figure 1: Conceptual model of e-learning adoption in Pakistan

4. Operationalization of constructs:

The purpose of this paper is to present the conceptual model of e-learning adoption in Pakistan. This study

enriches an in-depth understanding of concerns involved in e-learning adoption and sets foundation for empirical evidences. In addition, construct operationalization and measure identification is the first phase towards empirical studies. Therefore, the literature was comprehensively investigated to recognize the precise measures for the constructs proposed in the conceptual model. Table 2 presents the constructs along with the measure with respect to technology adoption literature. The constructs have been adapted from various existing studies.

Table 2: Operationalization of construct

Categories	Items	Measure	Authors
TAM	PEOU	Interaction with e-learning system involve a lot of my mental exertion.	(Davis & Venkatesh, 1996) (Ngai, et al., 2007)
		E-learning system provides all the required functionality that makes my task easy to perform in the learning process.	
		I find e-learning system easy to use.	
	PU	**Using E-learning system:**	(Davis & Venkatesh, 1996) (Ngai, et al., 2007)
		Increases my productivity in my studies (quality of learning).	
		Improves my performance in my studies (course grades, attendance)	
		enhances my effectiveness in my studies (skills either general or subject specific)	
	Attitude	Using e-learning is fun.	(Ngai, et al., 2007)
		Using e-learning is worthy idea	
		E-learning system offers an appealing learning environment	
	Behavior intention to use	I had access to e-learning system, I aim to use it	(Davis & Venkatesh, 1996)
		I predict that I would reuse it to assist my self-learning	
		I will not make use of e-learning system	
User Context	Self-efficacy	**I can accomplish my learning tasks using e-learning system even if:**	(Compeau & Higgins, 1995) (Tan & Teo, 2000)
		I have never used such kind of system before	
		I have online help or reference manuals for the system	
		I have observed someone else using such kind of system before trying it myself	
	Internet Experience	**How much you use the internet to perform the various activities:**	(Tan & Teo, 2000)
		Intensively (more than 2 hours per day)	
		Frequently (multiple times per day)	
		Variety of tasks (Group projects, assignments and presentations etc.)	
		Diversity of tools for your studies (e-mail, search engines, online discussion groups etc.)	
	Enjoyment	Using e-learning system is enjoyable	(Venkatesh, 2000) (Moon & Kim, 2001)
		I find entertaining using e-learning system	
		I find interesting using e-learning system	
	Computer anxiety	I am afraid of using computer due to fear of making mistakes	(Venkatesh, 2000) (Raaij & Schepers, 2008)
		I might lose a lot of information due to wrong key strokes	
		Computer are somewhat frightening to me.	
Social Context	Subjective norm	Individuals (family members, teachers or friends) important to me supports my use of e-learning system	(Taylor & Todd, 1995)
		Individuals (family members, teachers and friends) who influence me think that I should use e-learning system	
		Individuals whose opinion I value, prefer that I should use	

		e-learning system	
Organizational Context	Accessibility	Computers are readily available to use in the university labs	(Culnan, 1984)
		E-learning system is always up	
		ICT infrastructure is available	
System Context	System Functionality	E-learning encourages learners' control over learning activity	(Pituch & Lee, 2006)
		E-learning presents course contents clearly	
		E-learning system presents the material in well-organized readable format	
		E-learning offers multimedia course contents	
	System Interactivity	E-learning system facilitates interactive communication between instructor and students	(Pituch & Lee, 2006)
		E-learning system facilitates interactive communication among university students	
		The communication tools in e-learning system are effective (chat room, email, bulletin board etc.)	
	System Response	E-learning system response is fast while downloading lecture materials and uploading assignments	(Pituch & Lee, 2006)
		E-learning system has consistent response time	

5. Conclusion

Emergence of ICT into Education and business organizations is becoming increasingly popular. Implementation success of E-learning in higher education (HE) is cost effective solution for many developed countries. Moreover, low adoption and high underutilization of ICT have been a major problem for developing countries in terms of realizing the benefits of ICT. Developing countries are trying to adopt and merge the E-learning into their educational structure. It is highly needed to take the consideration of e-learning adoption and continued usage by university students of Pakistan.

Most of the research paid attention on the critical factors of the e-learning adoption. The need is to develop an assimilated model that identifies the relationship among the critical adoption drivers of the e-learning in Pakistan. This paper proposed a conceptual model of e-learning adoption based on TAM. The conceptual model contemplates the students as the focal users of the e-learning system. The anticipated model emphasize the fact that students' individual, organizational, social and system characteristics need to be well understood prior to develop an adoption model. The model proposed that the students' characteristics such as internet experience along with the enjoyment, self-efficacy and computer anxiety play an essential role to adopt e-learning technology. Organizational drivers such as system accessibility and easy access to the system are the factors which drive to the successful adoption of e-learning. In addition, system functionality, interactivity and response influence the adoption of e-learning. Various researchers stress the

fact that society can positively influence technology adoption. A number of communities have an interest in and perspectives on the relationship between people and ICTs. These include industry, academia, designers, policy makers and other institutions. The proposed conceptual model in this research is based on the existing literature and needs to be empirically validated through the validity and reliability measures in future. A theoretical model followed by the empirical evident of e-learning can help to cope with the adoption and usage in the context of Pakistan.

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