



# Investigating users' perspectives on e-learning: An integration of TAM and IS success model



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## ABSTRACT

The purpose of this paper is to examine an integrated model of TAM and D&M to explore the effects of quality features, perceived ease of use, perceived usefulness on users' intentions and satisfaction, alongside the mediating effect of usability towards use of e-learning in Iran. Based on the e-learning user data collected through a survey, structural equations modeling (SEM) and path analysis were employed to test the research model. The results revealed that "intention" and "user satisfaction" both had positive effects on actual use of e-learning. "System quality" and "information quality" were found to be the primary factors driving users' intentions and satisfaction towards use of e-learning. At last, "perceived usefulness" mediated the relationship between ease of use and users' intentions. The sample consisted of e-learning users of four public universities in Iran. Past studies have seldom examined an integrated model in the context of e-learning in developing countries. Moreover, this paper tries to provide a literature review of recent published studies in the field of e-learning.

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## 1. Introduction

To meet educational purposes and students' demands, e-learning development emerges to be a catalyst for today educational institutions (Alsabsy, Cater-Steel, & Soar, 2013; Docimini & Palumbo, 2013). E-learning can be defined as a dynamic and immediate learning environment through the use of internet to improve the quality of learning by providing students with access to resources and services, together with distant exchange and collaboration (Docimini & Palumbo, 2013; Jeong & Hong, 2013). E-learning supports learners with some special capabilities such as interactivity, strong search, immediacy, physical mobility and situating of educational activities, self-organized and self-directed learning, corporate training, personalized learning, and effective technique of delivering lesson and gaining knowledge (Bidin & Ziden, 2013; Docimini & Palumbo, 2013; Jeong & Hong, 2013; Martin & Ertzberger, 2013; Viberg & Gronlung, 2013). E-learning has a positive impact on both teachers and students in that it positively affects the duration of their attention, learning and training tenacity, and their attitudes towards collaboration and interaction (Chen & Tseng, 2012; Ozdamli & Uzunboylu, 2014). Past studies have indicated that anywhere and anytime learning and access to

information and communication are facilitated through using e-learning (Chen & Tseng, 2012; Ho & Dzeng, 2010; Islam, 2013; Pena-Ayala, Sossa, & Mendez, 2014). Kratochvíl (2013) and Abachi and Muhammad (2013) note that all individuals involved in e-learning are fond of using it towards learning because of flexible access in terms of time, space, and pace and online collaborative learning. However, demand for the development of e-learning is increasingly growing; still the need for research on potential factors affecting e-learning adoption like quality which is the heart of education and training in all countries (Ehlers & Hilera, 2012), is felt especially in the context of developing countries (Masoumi & Lindstrom, 2012), a fact that warrants investigation into it.

Past studies have used information technology adoption theories such as Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT) and the Unified Theory of Acceptance and Use of Technology (UTAUT) and the DeLone & McLean's model to explore e-learning users' behavioral patterns. Some of these studies have taken the barriers and the drivers of e-learning adoption into consideration (e.g., Chen & Tseng, 2012; Islam, 2012, 2013, 2014; Sumak, Hericko, & Punik, 2011). In this paper it is attempted to introduce an integrated model of TAM and DeLone & McLean's model for predicting individual's actual use of e-learning system in Iran. As Li, Duan, Fu, and Alford (2012) note, it is essential to examine the relationship between e-learners' experiences, perceptions, and their behavioral intentions to use, because system use is an important indicator of the system's success.

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Hassanzadeh, Kanaani, and Elahi (2012), in their attempts to assess e-learning systems success in Iranian universities, identified technical system quality, educational system quality, content and information quality, service quality, user satisfaction, and intention to use, influential towards use of system, system loyalty, and goal achievement. Motaghian, Hassanzadeh, and Karimzadegan Moghadam (2013), in their attempts to assess the influence of IS-oriented, psychological and behavioral factors on instructors' adoption of web-based learning systems in Iran, identified that perceived usefulness, perceived ease of use, and system quality improve instructors' intentions to use web-based learning systems.

However, only a limited number of published works have applied an integrated model of IS success model and TAM to explore e-learning usage drivers in the context of developing countries. This research, compared to Hassanzadeh et al. (2012), tries to step forward to investigate the students' perceptions of e-learning services based on an integrated model of TAM and IS success model and provides a literature review of recent published works in the context of e-learning which appear to be the main contributions of the paper. This paper is focused on Iran as a developing country in the Middle East, which possesses a large population of over 75 million individuals, 37 million of which according to Internetworldstats.com. (2012) are internet users, ranking Iran first in the Middle East and fourth in Asia. This study attempts to fill a research gap by addressing the effects of quality features of e-learning systems including educational quality, service quality, technical system quality, and content and information quality, accompanied with perceived ease of use and perceived usefulness on students' satisfactions and intentions towards use of e-learning, besides investigating mediating effect of perceived ease of use on intention through perceived usefulness.

The remainder of the paper is structured as follows: we address literature review in the next section. This is followed by the presentation of the research hypotheses, discussion of findings, conclusions, and finally recommendations for future studies.

## 2. Literature review

Owing to complicated, interrelated, and multi-faceted nature of IS success, early attempts fell short in defining information system success. To address this problem, a success model was presented by DeLone and McLean (1992) which was later modified to compensate for changing in IS over time. IS success model (DeLone & McLean, 2003) identified six components of IS success as follows: system quality, information quality, and service quality, intention to use/use, user satisfaction, and net benefits. In IS success model, system use precedes user satisfaction and positive experience with use contributes to the enhancement of satisfaction which sequentially leads to a higher intention to use (Petter, DeLone, & McLean, 2008). The revised IS success model, as one of the most widely used model for IS success, has so far been frequently adopted to examine e-learning system success.

The Technology Acceptance Model proposed by Davis and Bagozzi (Bagozzi, Davis, & Warshaw, 1992) appears to be the most widely used innovation adoption model. This model has been used in a variety of studies to explore the factors affecting individual's use of new technology (Venkatesh & Davis, 2000). Davis (1989) suggests that the sequential relationship of belief–attitude–intention–behavior in TAM, enables us to predict the use of new technologies by users. In fact, TAM is an adaptation of TRA in regard to IS which notes that perceived usefulness and perceived ease of use determine an individual's attitudes towards their intention to use an innovation with the intention serving as a mediator to the actual use of the system. Perceived usefulness is also considered to be affected directly by perceived ease of use.

Cheng (2012) in his study to examine whether quality factors can affect learners' intention to use e-learning system, incorporated instructor quality to other components of IS success model and concluded that information, service, system, and instructor quality play the antecedent role and come to be as the key drivers of employees' perceptions with regard to e-learning acceptance. Saba (2013), who carried out a study on implications of e-learning systems and self-efficacy on students' outcomes, concluded that system quality, information quality, and computer self-efficacy all affected system use, user satisfaction, and self-managed learning behaviors of student. Kim, Trimi, Park, and Rhee (2012) on their study on investigating the impact of quality on the outcomes of e-learning based on IS success model, found that system quality, information quality, and instructional quality positively influence user satisfaction. Li et al. (2012) identified that e-learning service quality, course quality, perceived usefulness, perceived ease of use, and self-efficacy directly affect, system functionality and system response indirectly affect, while system interactivity insignificantly affects on users' intentions towards use. Chang (2013) showed that web quality significantly and positively influences user value and user satisfaction; furthermore, he concluded that perceived value and satisfaction play the antecedent role in user's intention towards use of e-learning. Wang and Chiu (2011) who incorporated communication quality, information quality, and service quality in his model showed that all had significant positive effects on user satisfaction and loyalty intention to use the e-learning system for interacting experience, collaborating with others, and getting feedback. Owing to the rarity of research in examining the students' learning satisfaction with system quality of a system, Tajuddin, Baharudin, and Hoon (2013) carried out a study to examine the relationship between learning satisfaction and system quality which revealed a positive relationship. According to Tseng, Lin, and Chen (2011), the most significant determinants of e-learning effectiveness were the quality of the e-learning system and learner attractiveness. In his study, increased usage of multimedia features was figured out to attract learner's attention and eventually improve his attractiveness and reduction in the response time and waiting time for materials to load was found to improve the quality of the system; accompanied with the responsiveness of instructors to learners' questions which need to be maintained and improved. Islam (2012) who included perceived system quality in the his expectation–confirmation based IS model revealed that perceived usefulness, confirmation of initial expectation, and system quality significantly influenced students' satisfaction, sequentially satisfaction in addition to perceived usefulness significantly determined continuance intention towards e-learning usage. Udo, Bagchi, and Kirs (2011) indicated an instrument for assessing e-learning quality comprises five components including assurance, empathy, responsiveness, reliability, and website content that four of which (except reliability) are valid and reliable constructs to measure e-learning quality and influence learners' satisfactions and intentions to attend in online courses.

### 2.1. Other related theories and studies

On the other hand, there are other related theories that deserve to be mentioned. These are theories such as Theory of Planned Behavior (TPB) which discusses that adoption behavior is preceded by behavioral intention which in itself is a function of the individual's attitude, their beliefs about the extent to which they can control a particular behavior and other external factors; Social Cognitive Theory (SCT) is a framework for understanding, predicting, and changing behavior which introduces human behavior as a result of the interaction between personal factors, behavior, and the environment; Diffusion of Innovation Theory (IDT) which considers adoption of IS as a social construct that gradually develops

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