Understanding students' satisfaction and continuance intention of e-learning: Application of expectation–confirmation model

Forouzan Rezaeian Tiyar *, Chabahar Maritime University, Iran, Islamic Republic Of.
Hooshang Khoshsima, Chabahar Maritime University, Iran, Islamic Republic Of.

Abstract

The evolution of technologies leads to the great significance of e-learning in the domain of education. Recognition of the crucial factors which influence learners' aims towards continued use of e-learning would guide teachers, learners and e-learning developers to increase e-learning use. To this end, the present study investigates the Expectation-Confirmation Model (ECM) factors of Post-Adoption Expectation (PAE) which is explored via using language learners' post-adoption experiences in the use of e-learning systems. Learning process, tutor interaction, peer interaction, and course design are the four factors identified used for extending the perception of language learners' experiences in e-learning. The survey method was used to empirically validate the suggested model (ECM) of the present study. A total sample of 120 Iranian university students participated in the study.

In order to investigate the proposed model, structural equation modelling employing Smart PLS 2.0 was run. The findings indicate that learners' confirmation of using e-learning has a significant effect on the four aforementioned factors. Learning process and course design are the only two factors that have a significant effect on users' satisfaction and continuance intention. On the other hand, the results showed that tutor interaction and peer interaction do not have a significant effect on predicting learners' satisfaction and continuance intention of e-learning systems.

Keywords: e-learning, students' satisfaction, students' continuance intention, expectation-confirmation model, post-adoption expectation

*ADDRESS FOR CORRESPONDENCE: **Forouzan Rezaeian Tiyar**, Chabahar Maritime University, Iran, Islamic Republic Of.
E-mail address: f.rezaeiantiyar@yahoo.com

1. Introduction

The evolution of technologies has recently influenced not only people's way of life including communication and social affairs, but also their methods of education. Computer assisted language learning, which is known as one of the paramount components of modern education, has become widespread in the academic field in recent years. E-learning is defined as the intentional utilization of information systems and communication technology in teaching and learning procedures (Mohammadi, Ghorbani & Hamidi, 2011). It is a learner-centered and cooperative learning approach in which the teacher acts as a facilitator of the teaching and learning process. Therefore, a large number of institutes, organizations and education suppliers have decided to design and explore e-learning courses.

Contrary to the fact that the active use of e-learning has received a remarkable degree of favorable reviews among various users such as academics, teachers and learners, the intention to continue use of such systems is not great (Chiu, Sun, Sun, & Ju, 2007). According to Roca, Chiu and Martínez (2006), learners initially accept e-learning as a learning device but after a while they avoid using it.

Lee (2010) postulated that although the first-time acceptance and use of e-learning is the first most important stage towards accomplishing e-learning or information systems success, the long-term and actual success of these systems relies on its continued usage. It can be said that recognizing the crucial factors influencing learners' aims and intentions towards continued use of e-learning would guide teachers, learners and e-learning developers to increase e-learning use. Therefore, the success of e-based learning is particularly associated with learners' satisfaction and some other effective factors including perceived familiarity and usefulness, perceived enjoyment and intimacy which affect their intention to continue using e-learning services.

A remarkable number of studies have been done on the importance of users' intentions to continue using such systems permanently. These studies were founded on different well-known theories including the expectation-confirmation model (ECM), innovation diffusion theory (Rogers, 1995), flow theory, the expectancy disconfirmation theory, the unified theory of acceptance and use, the theory of planned behaviour (TPB) (Ajzen, 1991) and the technology acceptance model (TAM) (Davis, Bagozzi, & al, 1989). They proved the e-learning advantages in modern training and investigated how learners' understanding of such advantages is crucial in the continued use of this system. Furthermore, they explained why and how different users, such as language learners, are interested in using web-based (e-learning) services. TAM and TPB have been utilized to investigate variables which support and motivate individual users to accept and use an information system.

For example, Lee (2010) explored the expectation–confirmation model (ECM), the technology acceptance model (TAM), the theory of planned behaviour (TPB) and the flow theory, to hypothesize a theoretical model to explain and predict the users' intentions to continue using e-learning. The work of Lee (2010) concentrated on TAM and TPB models to clarify learners' post-adoption expectation (PAE) due to the known possibility of e-learning use. In other words, Lee (2010) examined the users' satisfaction with and continuance intention of e-learning according to the expectation-confirmation model (ECM) and then reported that the ECM factor of post-adoption expectation (PAE) can be explained by TAM and TPB models. The use of e-learning has resulted in the conduct of many studies at various academic levels in organizations. Despite such large volumes of studies, there is still a lack of adequate perception about learners' e-learning experiences and how these experiences could affect learners' satisfaction and their continuance intention toward the use of e-learning. The present research is derived from Lee's (2010) study. The researcher attempted to re-research the factors influencing learners' satisfaction and their intention to continue the use of e-learning. This study exploits learners' experiences in e-learning and uses them as a base for the measurement of PAE.

Paechter (2010) showed there are seven issues which can be used to identify learners' e-learning experiences. They include structure, tutor expertise, tutor support, flexibility, motivation, knowledge communication and relation communication. Different scholars presented particular definitions of

each of these measurement items. First, according to Brophy (2000) the stated structure contains those well-made learning materials that are necessary for developing successful course design and programs. Second, for the sake of supporting individual learners to become involved in ongoing activities, teachers can use tutor expertise and tutor support as significant factors while they are engaged in tutor interaction (Johnson, Hornik, & Salas, 2008). Third, the greatest importance of flexibility and motivation in establishing the self-regulation and pace in the act of the learning process leads them to be known as essential factors in the e-learning process (Narciss, Proske, & Koerndle, 2007). Fourth, Jucks, Paechter and Tatar (2003) reported that when learners attempt to interact together, they actually utilize the required knowledge and relation communication as major characteristics of interaction among themselves. Knowledge and relation communication lead the students to take advantage of a unified learning setting.

The current study utilized the ECM model to probe learners' satisfaction and their intention in the continued use of e-learning. Furthermore, it attempted to investigate the seven measurement items of learners' e-learning experiences introduced through the four main features of PAE including: learning process, peer interaction, tutor interaction and course design. This study used the ECM model as a base to design a framework in order to examine the process through which confirmation of expectation improves the four aforementioned features of PAE and also how these two cases influence learners' satisfaction and their continuance intention in e-learning use.

2. Literature review

2.1 Expectation-confirmation theory

There are many definitions of ECM. For example, it is defined as a model of Information Technology (IT) continuance used for examining continued information technology usage behaviour. The expectation-confirmation model is derived from the user behavioural literature and combined with both theoretical and empirical findings of preceding information system usage studies to theorize an effective model of information system continuance (Bhattacherjee, 2001b). This theory was initially used to investigate consumer satisfaction and post-purchase behaviour, service marketing and online banking users' continued use of an information system (IS) (Bhattacherjee, 2001b). Bhattacherjee (2001a; 2001b) suggested an ECM of IT continuance is on the basis of the congruence between individuals' continued use of IT decisions and their frequent purchase decisions. Lee (2010) stated that based on ECM, users' intention towards continued use of IT relies on three variables including the user's level of satisfaction with the IT, the extent of the user's confirmation of expectations, and post-adoption expectations, in the form of perceived usefulness. The constituents of ECM are shown in Figure 1.
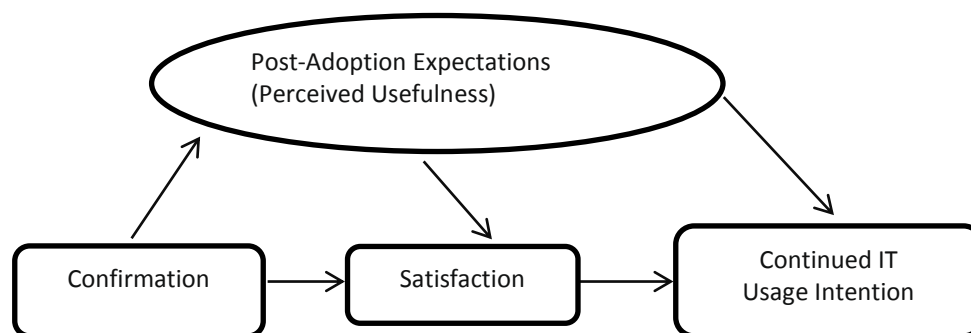

Figure 1. Expectation–confirmation model

As shown in Figure 1, the expectation-confirmation model is a model used for exploring pre-behaviour (expectation) and post-behaviour (perceived performance) variables rather than pre-behaviour. It is used to investigate users' behaviour in an IT post-adoption environment. The ECM illustrates that user satisfaction with IT usage is regarded as an important point in guiding individuals to have a continuance intention in using different types of web-based services. Satisfaction and confirmation have been known as the two essential terms in this model. Satisfaction is the overall evaluation of an information system that demonstrates an emotion-based response about the related IT (Lam, Shankar, & Erramilli, 2004). Users' satisfaction is an essential characteristic of continuance intention (Kim & Han, 2009; Thong, Hong, & Tam, 2006). Therefore, it can be shown that continuance intention in using an IT system is significantly related with user's satisfaction with its usage. According to Figure 1, confirmation is inversely connected with expectation and directly connected with perceived performance. Locke (1976) initially regarded satisfaction as "the pleasurable or positive emotional state resulting from the appraisals of one's job". Oliver (1981, p. 21) defined satisfaction as "the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience". These definitions consider satisfaction as a cognitive appraisal of the expectation-performance discrepancy (confirmation). It can be stated that lower expectation and/or higher performance results in higher confirmation. They accordingly influence people's satisfaction and continuance intention. On the other hand, the reverse condition leads to the disconfirmation, dissatisfaction and discontinuance intention. For example, a number of studies in the marketing domain reported that the level of people's satisfaction determines their decision to frequently purchase a product or a service (Bearden & Teel, 1983; Oliver, 1988; Szymanski & Henard , 2001). There is some type of relationship between consumers' decisions to repurchase a product/service and users' continuance intention toward using IT products or services. Considering this fact, it can be declared that ECM proposes comparable rapports in IT contexts. Individuals' confirmation of expectations and their perceived usefulness of IT identifies individuals' satisfaction with IT. It is viewed as a particular kind of post-adoption expectation. ECM proposed that individuals' confirmation of expectations shows individual users achieved and expected benefits via their experiences in the use of IT. Therefore, it can be stated that confirmation of expectations results in the creation of a positive impact on individuals' satisfaction.

According to the expectation-confirmation model, individuals' understanding of the usefulness of IT have a significant influence on their satisfaction with IT by working as a baseline for reference against confirmation judgments (Lee, 2010). On the other hand, the adaption level theory confirms the existence of such relationship. It is suggested that individual users would be able to understand the stimuli only in association with an adapted level. For example, studies that have been done in the case of marketing demonstrated that if users have a higher level of expectations, they would accordingly have higher levels of satisfaction (Oliver & DeSarbo, 1988). Furthermore, several studies in the areas of IT adoption reported that perceived usefulness is the most important determinant of users' adoption intentions (Davis, Bagozzi, & al, 1989; Taylor & Todd, 1995; Venkatesh, 2000). Thus, ECM considers that users' perceived usefulness of IT significantly influences their intention toward continued IT usage. Bhattacherjee (2001a; 2001b) postulated that when users' initial perceived usefulness is not concrete, which may be because of the uncertainty over what to anticipate from IT usage, their perceived usefulness of IT would be determined by confirmation experience.

TAM was first introduced by Davis (1989). It was known as the theoretical extension of reasoned action theory (Fishbein & Ajzen , 1975). According to this theory, Davis (1989) pointed out that it can be used to explain users' acceptance. TAM concentrates on two factors in terms of technology acceptance: perceived usefulness and perceived ease of use. Perceived usefulness is ''the degree to which a person believes that using a particular system would enhance his/her job performance" and perceived ease of use is ''the degree to which a person believes that using a particular system would be free of physical and mental effort" (Davis, 1989, p. 34). Perceived usefulness and perceived ease of use influence people's attitudes towards using the system and are related to TRA. These attitudes identify peoples' behavioural intentions that actually result in system use. TAM is widely used in several studies which focus on users'

acceptance of technologies consisting of e-mail, word processing, the World Wide Web, enterprise resources planning systems and e-commerce (Davis, 1989; Gefen & Straub, 1997; Lu & Zhou , 2009). Therefore, e-learning can be seen as a means of enhancing learners' learning efficiency that makes them able to readily interact with their teachers, classmates, peers, partners and the others online. Therefore, IT users' continuance intention is not much different from consumers' repurchase intention in that both conditions (1) follow an initial (acceptance or purchase) decision or intention, (2) are affected by the initial use (of IT or product) experience, and (3) can possibly lead to ex-post changing of the first decision (Bhattacherjee, 2001b).

2.2 Research model and hypotheses

This study attempted to explore and explain learners' satisfaction and their intention towards continuance in using e-learning via the application of the ECM model. Moreover, it attempted to:

1. investigate the relationship between confirmation and the four features of e-learning PAE;
2. investigate the relationship between the four features of PAE and learners' satisfaction and their continuance intention;
3. investigate the relationship between confirmation and satisfaction towards e-learning use.

The model proposed in this study is shown in Figure 1. Bhattacherjee's (2001) study pointed out that individuals' confirmation of expectation has a significant effect on the PAE of Internet Technology. Based on Bhattacherjee's (2001b) findings, it can be said that when learners adopt an e-learning system, their confirmation of expectations would significantly affect their perceptions of e-learning in the case of learning process, tutor interaction, peer interaction and course design. Thus, the research hypotheses can be stated as follows:

H1: Confirmation significantly affects learners' understanding of the learning process.

H2: Confirmation significantly affects learners' understanding of tutor interaction.

H3: Confirmation significantly affects learners' understanding of peer interaction.

H4: Confirmation significantly affects learners' understanding of the course design.

Bhattacherjee's study (2001b) indicated that individual users would have a higher level of satisfaction and continuance intention if they have a higher level of understanding of their PAE. The following hypotheses were suggested about learners' e-learning satisfaction on the basis of the abovementioned fact:

H5: Learners' perception of the learning process would have a significant impact on e-learning satisfaction.

H7: Learners' perception of tutor interaction would have a significant impact on e-learning satisfaction.

H9: Learners' perception of peer interaction would have a significant impact on e-learning satisfaction.

H11: Learners' perception of course design would have a significant impact on e-learning satisfaction.

Additionally, in the case of continuance intention the following hypotheses are made according to Bhattacherjee's (2001b) results:

H6: Learners' perception of learning process would have a significant impact on e-learning continuance intention.

H8: Learners' perception of tutor interaction would have a significant impact on e-learning continuance intention.

H10: Learners' perception of peer interaction would have a significant impact on e-learning continuance intention.

H12: Learners' perception of course design would have a significant impact on e-learning continuance intention.

The degree to which learners achieved the expected advantages regarding their utilization of e-learning is referred to as the confirmation of expectations. Lee (2010) demonstrated that confirmation had a positive influence on users' satisfaction and satisfaction has a high degree of significant impact on users' continuance intention. The following hypotheses result from Lee's (2010) study.

H13: Learners' confirmation of expectation has a significant effect on satisfaction.

H14: Learners' confirmation of expectation has a significant effect on continuance intention.

3. Research Methodology

3.1 Research design

This research is an empirical study which used a survey method to investigate the proposed research model (Expectation-Confirmation Model: ECM). The researcher used Lee's (2010) study as a base to measure learners' confirmation, satisfaction and continuance intention. Each of these three factors involved three items. On the other hand, the e-learning PAE was developed on the basis of Paechter et al.'s (2010) study about learners' e-learning experiences. This study investigated the within grouping concept and divided the previously noted measurement items into these factors:

1. learning process: flexibility and motivation;
2. tutor interaction: tutor expertise and tutor support;
3. peer interaction: knowledge communication and relation communication, and
4. course design: course structure.

These measurement items were based on a five-point Likert scale.

3.2 Research sample

A sample of 250 Iranian university students who had some sort of experience in using e-learning (about 96%) took part in this study. The questionnaires were randomly distributed among all of the 250 subjects. One-hard fifty questionnaires with invalid responses were discarded. A total of 120 subjects fully answered the questionnaires. Therefore, 120 questionnaires were used for the purpose of the current study. Thirty-seven percent of the respondents were male and 63% were female (120 respondents). The respondents were aged between 18 and 27 years old. Their age ranges were as follows: 85% of the respondents were aged 18 to 25 and 15% of the respondents were aged above 25. Regarding the Web use experience, 33% of the respondents selected web browsing, 29% selected e-mail, 27% selected chat-rooms, and 11% selected downloading.

3.3 Data analysis.

Structural Equation Modelling (SEM) software and Partial Least Squares (PLS) were used for data analysis. They were used to investigate the measurement and structural model. Since PLS leads to minimal demands on sample size and normal distribution (Chin , 1998), it was used in this study. A two-stage modelling service was implemented: 1) assessing the measurement model and 2) testing the structural model.

4. Results and discussion

Chin's (1998) proposed criteria were utilized to assess the convergent validity and discriminate validity of the measurement model. The convergent validity of the model equals more than 0.7 which is ranged from 0.75-0.95. AVEs are more than 0.5 which are ranged from 0.70-0.89. Factor loadings are more than 0.7 which are ranged from 0.85-0.95. It can be noted that the measurement model indicates high discriminate validity in that the square root of the AVE for each construct is larger than its correlation with other factors.

At the next stage, the researcher tested the research hypotheses in terms of assessing the structural model. The estimated path coefficients and the variances (R^2 values) of the dependent variables are indicated in Figure 2. The results of the hypothesis testing (H1-H4) revealed that there are significant relationships between confirmation and the four factors of PAE. Learners' perceptions of learning process and course design have a significant effect on satisfaction and continuance intention. Thus, the following hypotheses were proved: H5, H6, H11 and H12. The results obtained showed tutor interaction and peer interaction do not have a significant influence on satisfaction and continuance intention. Therefore, it can be said that hypotheses H7, H8, H9 and H10 were rejected. On the other hand, there is a significant relationship between confirmation, satisfaction and continuance intention. Thus, the hypotheses H13 and H14 were confirmed. The total explanatory power of the proposed model has an R^2 of 65% of e-learning satisfaction and an R^2 of 59% of continuance intention.

The findings of this research illustrate that learners' confirmation of expectation is significant in predicting their e-learning PAE in the case of learning process, tutor interaction, peer interaction and course design. It shows that particular attention and attempts should be paid to prepare and train learners to efficiently use e-learning so that they could enhance their confirmation of expectation and improve their satisfaction accordingly. Of the four factors of PAE introduced, learners' perception of learning process has the most positive influence on satisfaction and continuance intention. Thus, effective flexibility should be stipulated in the learning process in order to assist learners to take responsibility for their own learning.
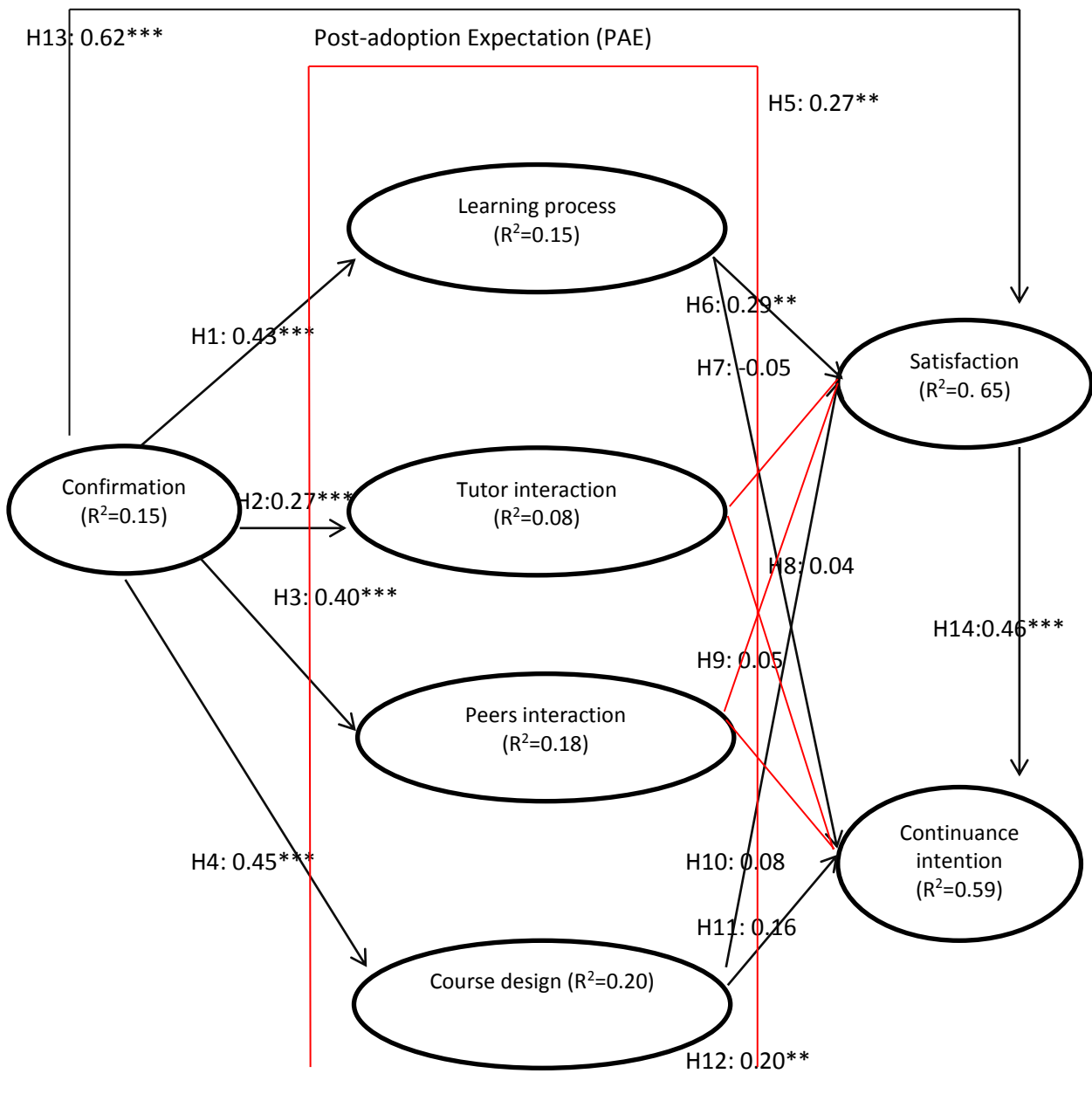
Note: *p<0.10; **p<0.05; ***p<0.01
Figure 1. Research model and results

On the other hand, the results showed that the secondary indicator of satisfaction and continuance intention belongs to course design. It illustrates that e-learning practitioners should develop and design an effective e-learning course structure and explore reasonable course materials in the e-learning system. The findings revealed tutor interaction and peer interaction have no significant effect on e-learning satisfaction and continuance intention. This might be due to the fact that at the university level, learners' use of e-learning critically concentrates on obtaining learning materials but not on communication and collaboration (Njenga & Fourie, 2010). It is suggested that e-learning suppliers

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should provide more opportunities to improve communication in the e-learning system and to accelerate learners and tutors interaction.

5. Conclusion

This study mainly aimed to empirically investigate learners' satisfaction and continuance intention towards e-learning on the basis of the Expectation-Confirmation Model (ECM). The researcher utilized the four factors of learning process, tutor interaction, peer interaction, and course design for the sake of measuring learners' post-adoption expectation (PAE) of e-learning. The present study attempted to obtain a good understanding of learners' confirmation of expectation and how this fact would affect their perceptions of four PAE factors. Furthermore, it tried to examine how these factors influence learners' satisfaction and continuance intention. First, the findings revealed that confirmation has a significant relationship with PAE factors and satisfaction in the use of e-learning. Second, learning process and course design have a significant effect on satisfaction and continuance intention. It can be concluded that e-learning developers should make great efforts to enhance learners' confirmation of expectations and facilitate their PAE through promoting learning process and the design of e-learning courses.

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