



Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model

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ABSTRACT

Although e-learning has been prompted to various education levels, the intention to continue using such systems is still very low, and the acceptance-discontinuance anomaly phenomenon (i.e., users discontinue using e-learning after initially accepting it) is a common occurrence. This paper synthesizes the expectation–confirmation model (ECM), the technology acceptance model (TAM), the theory of planned behavior (TPB), and the flow theory to hypothesize a theoretical model to explain and predict the users' intentions to continue using e-learning. The hypothesized model is validated empirically using a sample collected from 363 learners of a Web-based learning program designed for continuing education. The results demonstrate that satisfaction has the most significant effect on users' continuance intention, followed by perceived usefulness, attitude, concentration, subjective norm, and perceived behavior control as significant but weaker predictors. The implications of these findings for e-learning practitioners are discussed at the end of this work.

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1. Introduction

With the rapid growth of the Internet, numerous education/training institutes and companies have devoted great efforts and large sum of money to develop e-learning programs for users. However, while e-learning has been promoted to various levels of users, the intention to continue using such system is still very low (Chiu, Sun, et al., 2007). In addition, the acceptance–discontinuance anomaly phenomenon (users discontinue using e-learning after initially accepting it) frequently occurs (Roca, Chiu, et al., 2006). Although initial acceptance of e-learning is an important first step toward achieving e-learning success, actual success still needs continued usage. Therefore, understanding the factors affecting customers' intention to continue using e-learning will not only assist e-learning developers in designing popular contents, but also help teachers and vendors design strategies that are more likely to increase the use of e-learning.

In this paper, we synthesize the expectation–confirmation model (ECM), technology acceptance model (TAM), theory of planned behavior (TPB), and flow theory to hypothesize a new model to explain users' intention to continue using e-learning. We combine these four theoretical perspectives for the following three reasons. First, although previous research has found ECM to be a robust model for continued IT adoption (Bhattacharjee, 2001a, 2001b), it employs only three variables to explain behavioral intention, namely satisfaction, confirmation, and post-adoption expectations. However, a user's behavioral intention toward adopting IT will also be affected by other factors, such as the opinions of important individuals (subjective norms) (Fishbein & Ajzen, 1975). Furthermore, even if users have a strong intention to perform a behavior, they may feel that they lack the necessary resources and skills (perceived behavioral control) (Ajzen, 1991), and the use of TPB addresses this gap. Second, while TPB captures the roles of individuals, organizational members, and social influences on behavioral intention, it does not inform us what attitudinal beliefs would affect a user's attitude toward e-learning (Wu & Chen, 2005). According to Taylor's research (Taylor & Todd, 1995a, 1995b), TAM provides two attitudinal beliefs, namely perceived ease of use and perceived usefulness as two major antecedents of attitude, which make up precedent factors of attitude for TPB. Moreover, since each theory has distinct roots and is based on a different set of antecedent variables, we contend that they independently provide a partial understanding of users' cognitive processes related to IT usage. It is therefore possible that, when combined, these theories may collectively provide an improved and more comprehensive understanding of the cognitive processes and behaviors related to IT usage than when each theory considered alone. Third, adding the flow theory allows us to capture the elements of motivation related to fun and entertainment, with regard to the adoption of e-learning (Koufaris, 2002). Flow has been used to describe a state in which “people are so involved in an activity that nothing else seems to matter” (Csikszentmihalyi, 1997), such as when users play online games. During the states of flow, other events occurring

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in users' surrounding environment lose significance and their sense of time becomes distorted (Hoffman & Novak, 1996). When people use e-learning systems, there is potential for them to experience flow, as most e-learning products provide chats room, message boards, and entertainment functions, all of which may provide enjoyment and lead to concentration and engagement in users. Therefore, we will also use flow theory to examine user's continued usage of e-learning.

While prior research has examined ECM, TAM, and TPB independently in explaining information technology (IT) usage, to the best of our knowledge, no study has yet theoretically combined these three models. The primary contributions of this study are its examination of the integration of ECM, TAM, TPB and flow theory in explaining long-term e-learning usage intention and an empirical evaluation of which factors are critical to affecting this intention. The findings from this paper may therefore help bridge the existing gap between acceptance and continuance streams of e-learning usage research. The results of this work are expected to give both practitioners and academics an increased understanding of users' continuance intention, which can then be used as a guideline to devise more appropriate e-learning products.

The rest of the paper is organized as follows. Section 2 presents our research model and hypotheses, while Section 3 proposes the measurement method and scales. We present the research results in Section 4, followed by discussion in Section 5. Finally, the implications and conclusions of this work are presented in Sections 6 and 7.

2. Research model and hypotheses

We next develop our research model and hypotheses based on the expectation–confirmation model, the technology acceptance model, the theory of planned behavior, and flow theory.

2.1. Expectation–confirmation model (ECM)

In the IT literature, Bhattacharjee (2001a, 2001b) proposed an ECM of IT continuance based on the congruence between individuals' continued IT usage decisions and consumers' repeat purchase decisions. The ECM posits that an individual's intention to continue IT usage is dependent on three variables: the user's level of satisfaction with the IT; the extent of user's confirmation of expectations; and post-adoption expectations, in the form of perceived usefulness. Fig. 1 presents the ECM.

There are five main hypotheses in the ECM. First, users' satisfaction with IT has a positive effect on their intention to continue using the IT. Studies in marketing have discovered that the major reason for a consumer's decision to repurchase products or patronize services is their level of satisfaction (e.g. (Bearden & Teel, 1983; Oliver, 1993; Szymanski & Henard, 2001)). Owing to the similarity between re-purchasing products/services in a consumer context and the continued usage of IT products/services, the ECM posits an equivalent relationship in the latter context. In turn, user's satisfaction with IT is determined by the user's confirmation of expectations and their perceived usefulness of IT (which is one type of post-adoption expectation). The confirmation of expectations suggests that users obtained expected benefits through their usage experiences with the IT, and thus leads to a positive effect on users' satisfaction. On the other hand, based on the expectancy-confirmation paradigm, users' perceived usefulness of IT has a positive effect on their satisfaction with IT by working as a baseline for reference against confirmation judgments. This relationship is supported by the adaptation level theory, which proposes that users perceive stimuli only in relation to an adapted level.

Prior marketing studies have found that the higher the users' expectations, the higher are their satisfaction (Oliver & DeSarbo, 1988). Moreover, the IT adoption literature has consistently found that perceived usefulness is the most important determinant of users' adoption intentions (Davis, Bagozzi, et al., 1989; Taylor & Todd, 1995a, 1995b; Venkatesh, 2000). As a result, the ECM posits users' perceived usefulness of IT has a positive effect on their intention to continue IT usage. Lastly, the ECM posits that the users' confirmation of expectations will have a positive effect on the perceived usefulness of IT. Perceived usefulness of IT could thus be adjusted by confirmation experience, particularly when the users' initial perceived usefulness is not concrete due to the uncertainty over what to expect from using the IT (Bhattacharjee, 2001a, 2001b). Because e-learning is a kind of information technology on the Internet, we derived the following hypotheses from the ECM:

H1. Users' satisfaction with e-learning is positively related to their continued e-learning usage intention.

H2. Users' confirmation of expectations is positively related to their satisfaction with e-learning.

H3. Users' perceived usefulness of e-learning is positively related to their satisfaction with e-learning.

H4. Users' perceived usefulness of e-learning is positively related to their continued e-learning usage intention.

H5. Users' confirmation of expectations is positively related to their perceived usefulness of e-learning.

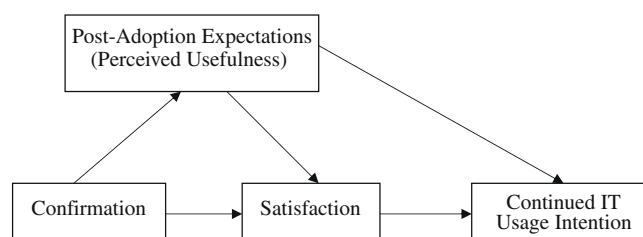


Fig. 1. Expectation–confirmation model.

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