A model of organizational employees' e-learning systems acceptance

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ABSTRACT

This study examines the factors that influence employees' adoption and use of e-learning systems and tests the applicability of the technology acceptance model (TAM) in the organizational context. We examined the relationship of employees' perceptions of their behavioral intention to use e-learning systems in terms of four determinants (individual, organizational, task characteristics, and subjective norm), to further explore the effects of management and organizational support on the subjective norm. Data were 357 valid questionnaires from four industries in Taiwan. The findings indicate that organizational support and management support significantly affected perceived usefulness and intention to use. Individuals' experience with computers and computer self-efficacy had significantly positive effects on perceived ease of use. Task equivocality significantly influenced perceived usefulness. Organizational and management supports significantly impacted the subjective norm, perceived usefulness, perceived ease of use, and intention to use. Additionally, the results suggest that external variables that affect perceived usefulness, perceived ease of use, and intention to use, need to be considered as important factors in the process of designing, implementing, and operating e-learning systems. The results provided a more comprehensive insight of individual, organizational, and task characteristics in predicting e-learning acceptance behavior in the organizational contexts, rarely tested in previous studies. By considering these identified factors, practitioners can take corresponding measures to predict or promote organizational employees' e-learning systems acceptance more effectively and efficiently. Furthermore, by explaining employees' acceptance behavior, the findings of this research help to develop more user-friendly e-learning systems and provide insight into the best way to promote e-learning systems for employees.

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1. Introduction

Information technology has dramatically altered the way people teach and learn. Electronic learning (e-learning), a new approach in education, highlights learner-oriented and life-long teaching–learning processes (Ong et al., 2003) [82]. E-learning generally refers to the use of computer network technology, primarily over an intranet or through the Internet, to deliver information and instruction to individuals. The characteristics of e-learning fulfill the requirements for learning in a technologically advanced society and have created great demand from businesses for e-learning systems [75]. E-learning allows training to reach diverse and geographically dispersed workforces in a cost-efficient manner, and can take place on-demand and at a lesser cost than on-site training.

E-learning systems have become popular tools for facilitating teaching and learning processes that allow flexible learner-centered training. In this case, the e-learning system is defined as an information system that can integrate a wide variety of instructional material (via audio, video, and text mediums) conveyed through e-mail, live chat sessions, online discussions, forums, quizzes and assignments. Additionally, e-learning encompasses Internet, intranet, extranet, satellite broadcasts, interactive TV and CD-ROMs, allowing for synchronous and asynchronous communication and instructional delivery between trainers and learners. Consequently, these e-learning systems may better meet the needs of employees who are geographically dispersed or have conflicting schedules.

In order to meet the needs of today's highly competitive global economy, employees must be up-to-date with the latest knowledge and technologies. To cultivate a highly trained and educated workforce, organizations have invested substantial resources in developing e-learning alternatives to traditional types of training systems [57]. Training is considered to be a key strategic organizational tool and is associated with higher profits and lower employee turnover. Many organizations have adopted e-learning solutions for their corporate training, such as Dell Learning, CISCO E-Learning, and the HP Virtual Classroom [23]. As a result, organizations are increasingly relying on e-learning as a solution to training issues of immediacy, convenience, and consistency [23]. E-learning

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plays a significant role in training and development within the organizational environment.

The benefits of e-learning applications in organizations and educational institutions have been discussed in many studies [69,10,35,39,72]. Although e-learning systems are increasingly being used and are proving to be beneficial in organizations and educational institutions, the problem of underutilization remains [52,64,67,69]. Whereas business and educational institutions have invested substantial resources in e-learning systems [81,65], the benefits of such systems will not be achieved if learners fail to use the system [73,63]. Therefore, researchers and practitioners alike strive to investigate the decision of whether an individual will adopt those technology systems that appear to promise substantial benefits [63,21,22,29,91] (Hu et al., 1999; Venkatesh et al., 2003). Furthermore, the study of user perception (McMahon et al., 1999) and an understanding the factors that promote effective use of those systems (Mun & Hwang, 2003) become increasingly essential to improve understanding and prediction of acceptance and utilization of educational technologies in organizational contexts (Lau & Woods, 2008). Prior empirical studies made efforts to explicate the determinants and mechanisms of users' adoption decisions on the basis of the technology acceptance model (TAM) [21,22,20,85,88,89] with the conviction that the adoption process influences successful use of particular technology systems (Grover et al., 1998; Karahanna, Straub, & Chervany, 1999; Liao, Palvia, & Chen, 2009).

The TAM, adapted from a theory of reasoned action (TRA) [3,27], has been used as a theoretical basis for many empirical studies of user technology acceptance [85,88,89]. The TAM has partially contributed to understanding end-users' acceptance of e-learning systems (Ajzen & Fishbein, 1977) [21,22,7,94]. A number of studies have focused on acceptance by students in educational institutions [76,86,44,79,93]. However, research literature that addresses learner acceptance of e-learning systems in organizational contexts is scarce. Ong et al. [69] examined perceived credibility and computer self-efficacy to investigate the applicability of the TAM in explaining engineers' decisions to accept e-learning. In their investigation of workers' intentions to use e-learning in four international agencies of United Nations, Roca and Gagne (2007) proposed perceived autonomy support, perceived competence and perceived relatedness as determinants of the TAM variables. Although research exists on some specific external variables in an attempt to understand users' acceptance behavior of e-learning in organizational contexts, existing parameters of the TAM are not sufficient to fully reflect the e-learning system end-users' acceptance within organizations, and further examination of additional factors is still required [69].

Thus far, it has not been clear as to what additional factors would affect e-learning system usage behavior and intentions in organizational contexts. Studies investigating the determinants related to e-learning systems use have not been empirically tested from the more comprehensive perspectives of individual, organizational, and task characteristics in the organizational context [54,63,61,56]. Additionally, researchers have suggested that TAM studies should extend beyond technology-based tools and include a broader range of social factors, such as the subjective norm, to better predict users' technology use and acceptance [12,77,96]. Subjective norm, a construct from the theory of reasoned action (TRA), was found to be affected by external variables [2]. A substantial body of empirical evidence has been accumulated to provide support for the predictive power of the combined model of TAM and TRA in the context of IT acceptance [3,27,19,47,85]. However, several researchers (David et al., 1989) [54] indicated that subjective norm was not a significant construct in TAM. This could be attributed to the use of students as respondents in many TAM studies. As Taylor and Todd [85] noted, subjective norm is expected to be more important in an organizational setting. In the present study, the participants were those who may experience some social pressure to use the e-learning systems in the organizations.

Accordingly, the present study used the TAM as a baseline model and the inclusion of subjective norm (from TRA) to explain the dynamics of user acceptance of an e-learning system. The purpose was to establish a theoretical framework for understanding the conditions under which e-learning systems adoption was practical and beneficial in the organizational context. Specifically, we identified a rich set of antecedents to determine the comprehensive nature of e-learning systems adoption in organizations. To accomplish this aim, structure equation modeling (SEM) was applied to examine and validate the hypothesized relationships of employees' perceptions of their behavioral intention to use e-learning systems in terms of four aspects of determinants (individual, organizational, task characteristics, and subjective norm), and to further explore the effect of management and organizational support on subjective norms. Hopefully, by examining the impact of these specific antecedents on e-learning systems acceptance in organizations, the knowledge base on important determinants of e-learning system adoption can be expanded. This empirical study could be useful for researchers to develop theories, and practitioners to better understand the strategies for designing and promoting e-learning systems in organizations.

In the next section, we establish the theoretical foundation for the research model, and explain our reasons for adopting it as the theoretical framework of this study. This is followed by a description of the survey instruments and data collection methods. We then present the results of testing our hypotheses, and finally, the limitations, conclusions, and implications are discussed.

2. Theory of reasoned action and the technology of acceptance model

The theory of reasoned action (TRA), originating from social psychology, is formulated as generalized explanations of a broad range of individual behaviors [3]. It should be appropriate for studying the determinants of computer usage behavior as a special case. The theory states that attitude and subjective norm are two typical determinants of behavioral intention that define behavior [3,27].

In the TRA, the subjective norm refers to "the person's perception that most people who are important to him think he should or should not perform the behavior in question" [27, p. 302]). Information system researchers assert that any factor could affect the subjective norm [59,54,90]. Thus, variables such as system design characteristics, user characteristics, task characteristics, and organizational structure would fall into this category, which Fishbein and Ajzen [27] refer to as "external variables." A substantial body of empirical data in support of the TRA has been accumulated [3,27]. Additionally, the TRA has been empirically tested and many studies have provided support for the predictive power of the model in the context of IT acceptance [85].

Davis (1986, 1989) introduced the technology acceptance model (TAM) to theoretically extend the TRA model. "The TAM adapted the generic TRA model to the particular domain of user acceptance of computer technology, replacing the TRA's attitudinal determinants, derived separately for each behavior, with a set of two variables: perceived ease of use (PEOU) and perceived usefulness (PERUSE)" [46, p. 88]. The TAM was derived to apply to some specific domains of human–computer interaction [21,22]. The TAM asserts that two salient beliefs—perceived usefulness (PU) and perceived ease of use (PEU)—determine technology acceptance and are the key antecedents of behavioral intentions to use information technology. The first belief, PU, is the degree to which an