A study of investigating learners attitudes toward e-learning

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Abstract. In an attempt to study and explore individual's attitudes and behaviors in using e-learning, this research proposes gender difference, computer related experience, self-efficacy, and motivation aspects. In this study, 424 university students use the Blackboard system and answer a questionnaire after using it for two months. The results demonstrate male students have more positive e-learning attitudes than female students do, computer related experience is a significant predictor on learners' self-efficacy and motivation toward e-learning. Furthermore, self-efficacy and motivation, including intrinsic and extrinsic motivation, are significantly predictors on behavioral intention of using e-learning.

Keywords: e-learning, learner attitudes, self-efficacy, motivation

1. Introduction

Computers and the Internet designed for educational purposes have fundamentally altered school education, especially in universities. With the enormous advances in computers and the Internet, the e-learning (electronic learning) urgently needs the application of new technologies in order to enhance the quality of teaching and learning (Liaw, 2002). In essence, e-learning systems, such as the Blackboard or WebCT, possess four characteristics (Liaw & Huang, 2003). First, e-learning offers a multimedia environment. Second, e-learning system supports interactive communication whereby users have full control over their own learning situations. This high-level interaction gives them dynamic control of information. Third, e-learning supports networking for accessing and sharing information. An e-learning system goes beyond static Web pages, by creating fully interactive networks with information exchange between learners and servers. And fourth, by implementing as a web-based application, e-learning provides a cross-platform environment, which allows e-learning systems to be executed independently on various computer operating systems.

This research builds a multiple approach to examine individual attitudes toward the Blackboard that includes gender difference, computer related experience, perceived self-efficacy, and perceived motivation aspects. Based on gender difference, this research will examine attitudes between male and female university students toward e-learning. Furthermore, how computer related experience can affect learners' self-efficacy and motivation toward e-learning will also be conducted. Moreover, the predictive relationship of self-efficacy and motivation on behavioral intention of using e-learning will also be investigated in this research.

2. Research hypothese

Many previous studies find that males surpass females both in experience with computers and information technology and positive attitude toward them (e.g., Brosman, 1998; Colley, 2003; Fan & Li, 2005; Liaw, 2002). One result of the varied computer experiences of males and females is a different approach to

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computers. Through playing with computers, male students learn to regard computers as toys or as technology to be mastered. Female students approach computers differently and tend to use them as tools to assist them in producing work (Colley, 2003). Besides, women have a preference for sticking to routines they know, whereas men interact with software in a more playful and exploratory manner (Giacquinta, Bauer & Levin, 1993; Singh, 2001). Based on gender difference prospective, we propose the following hypotheses.

H1: There has a significant gender difference in computer related experience.

H2: There has a significant gender difference in learners' attitudes toward e-learning.

Regarding the predictive relationship among computer related experiences on e-learning users' attitudes, Liaw and Huang (2003) stated that experience with word processing was a positive predictor on individual perceived enjoyment of search engines and experience using operating systems can predict individual perceived ease of use of search engines. Furthermore, previous studies provide evidences (Igabaria, Guimares, & Davis, 1995; Mitra, 1998) proving that individual computer and Internet experience positively affect on the individual perceived enjoyment of and ease of use information systems. On the other hand, Garland and Noyes (2004) argued that computer experience was a poor predictor of computer attitudes. Thus, this study will examine whether computer experience is a predictor on e-learning or not. And we propose the following hypotheses:

H3: Computer related experience is a positive predictor on learners' self-efficacy toward e-learning.

H4: Computer related experience is a positive predictor on learners' motivation of using e-learning.

From relevant research (Liaw, 2002; Moon & Lim, 2001; Vankatesh, 1999), users' perceived enjoyment of information systems will demonstrate positive influence on their perceived usefulness of information systems. Liaw and Huang (2003) also stated that motivation is a key factor to influence users' intention of using Internet technology. Furthermore, previous research (Al-Khaldi & Al-Jabri, 1998; Liaw, Chang, Hung, & Huang, 2006) demonstrated that self-efficacy is a key factor to influence users' behavioral intention toward information technology. Based on relevant research, this study proposes a hypothesis:

H5. The more the learners have perceived self-efficacy and motivation (including intrinsic and extrinsic motivation) of using e-learning, the more they will intend to use e-learning.

3. Research methodology

3.1. Participants

This study conducts a survey for understanding learner attitudes toward the Blackboard e-learning system. The survey was distributed to 560 university students who have used Blackboard for two months. Participants were invited to complete the questionnaire. The questionnaires, including a cover letter, were distributed to participants during class. All subjects were asked to respond to the questionnaire and their responses were guaranteed to be confidential. All 560 students participated the questionnaire survey. However, 136 missing responses were eliminated. Therefore, of the study group comprised of 424 students which includes 191 male students and 233 female students.

3.2. Measurement

The data for this study were gathered by means of a paper-and-pencil survey. The questionnaire included three major components: (a) demographic information, (b) computer experience, and (c) attitudes toward e-learning. The following shows the content of the questionnaire.Demographic information: The demographic component covered gender and the field of study. Computer experience: In this component, participants were asked to indicate whether they had experience with operating systems, the Internet, online library databases, and e-learning. These 4 questions were made using a 7-point Likert scale (ranging from 1 which means ''no experience'' to 7 which means ''well experienced'').Attitudes toward e-learning: Participants were asked to indicate their attitudes toward e-learning. These 13 questions were adopting a 7-point Likert scale (ranging from 1 which means ''strongly disagree'' to 7 which means ''strongly agree'').

4. Results

The means of computer experience and e-learning attitudes are presented in Table 1. The internal consistency reliability was assessed by computing Cronbach's αs. The alpha reliability was highly accepted (α=0.96) and items' coefficients are presented in Table 2. The values ranged from 0.57 to 0.81. Given the exploratory nature of the study, reliability of the scales was deemed adequate.

Table 1: Descriptive statistics of computer experience and e-learning attitudes

Variables	M	S.D.	Male M	Male S.D.	Female M	Female S.D.
Experience with operating systems	5.33	1.65	5.36	1.65	5.30	1.63
Experience with the Internet	6.09	1.16	6.03	1.22	6.13	1.11
Experience with online library databases	4.30	1.66	4.23	1.75	4.36	1.59
Experience with e-learning	3.48	1.68	3.54	1.70	3.44	1.66
Perceived self-efficacy of using e-learning	4.23	1.39	4.39*	1.48	4.11	1.31
Perceived enjoyment of using e-learning	3.95	1.26	4.08*	1.24	3.84	1.26
Perceived usefulness of using e-learning	4.30	1.30	4.42	1.26	4.20	1.32
Behavioral intention of using e-learning	4.10	1.18	4.27*	1.17	3.97	1.17

*: Significant gender difference

Table 2: The Mean, Standard Deviation, item-total correlations of e-learning attitudes

Items	M	S.D.	r*
Perceived self-efficacy of using e-learning:			
I feel confident using the e-leaning system (the Blackboard).	4.25	1.49	0.72
I feel confident operating e-learning functions.	4.23	1.43	0.71
I feel confident using online learning contents.	4.23	1.44	0.72
Perceived enjoyment of using e-learning:			
I am enjoyed with using e-learning as an assisted learning tool.	3.90	1.44	0.767
I am enjoyed with using e-learning functions.	3.87	1.38	0.77
I am satisfied with learning contents.	3.95	1.35	0.77
I am enjoyed with multimedia instruction.	4.08	1.37	0.79
Perceived usefulness of using e-learning:			
I believe e-learning contents are informative.	4.33	1.46	0.78
I believe e-learning is a useful learning tool.	4.27	1.36	0.77
I believe e-learning contents are useful.	4.30	1.41	0.79
Behavioral intention of using e-learning:			
I intend to use e-learning to assist my learning.	4.14	1.40	0.80

I intend to use e-learning contents to assist my learning.	4.13	1.39	0.78
I intend to use e-learning as an autonomous learning tool.	4.04	1.28	0.61

r*: Corrected Item-total correlation

An independent-samples t test was conducted to evaluate the hypotheses H1 and H2. The results showed that there has no significant gender difference on computer experience. Regarding e-learning attitudes, the statistical results indicated there was a significant gender difference on perceived self-efficacy of using e-learning, $t(422) = 383.00$. $p = 0.035$, a significant difference on perceived enjoyment of using e-learning, $t(422) = 409.09$. $p = 0.049$ and a significant difference on behavioral intention of using e-learning, $t(422) = 404.87$, $p = 0.009$. These results showed that those male students had more positive attitudes toward e-learning.

For investigating hypotheses H3 and H4, the predictive model is an available statistical method. Regarding analytic strategy for assessing the predictive model, path analysis is an appropriate multivariate analytical methodology for empirically examining sets of relationships in the form of linear causal models. The value of the path coefficient associated with each path represents the strength of each linear influence. Although the path coefficient can be estimated in many ways, multiple regression analysis has been used by most empirical applications of this methodology.

To investigate H3, a regression analysis was performed to check the effects of experience with operating systems, experience with the Internet, experience with online library databases, and experience with e-learning on perceived self-efficacy of using e-learning. The result showed that three factors were predictors (experience with e-learning, experience with the Internet, and experience with operating systems) and experience with e-learning had more contributions than the other two predictors ($F(3, 420)=82.96$, $p<0.001$, $R^2=0.30$). Regarding H4, a regression analysis was performed to check the effects of experience with operating systems, experience with the Internet, experience with online library database, and experience with e-learning on perceived enjoyment of using e-learning (intrinsic motivation). The result showed that three factors were predictors (experience with e-learning, experience with the Internet, and experience with online library databases) and experience with e-learning had more contribution than the other two factors ($F(3, 420)=63.65$, $p<0.001$, $R^2=0.28$). Regarding H4, another regression analysis was performed to check the effects of experience with operating systems, experience with the Internet, experience with online library database, and experience with e-learning on perceived usefulness of using e-learning (extrinsic motivation). The result showed that two factors were predictors (experience with e-learning and experience with the Internet) and experience with e-learning had more contribution ($F(2, 421)=61.09$, $p<0.001$, $R^2=0.17$).

Regarding H5, a regression analysis was performed to check the effects of perceived self-efficacy of using e-learning, perceived enjoyment of using e-learning, and perceived usefulness of using e-learning on learners' behavioral intention of using e-learning. The result presented that three factors were all positive predictors and perceived usefulness of using e-learning had more contribution than the other two predictors ($F(3, 420)=122.84$, $p<0.001$, $R^2=0.63$).

5. Discussions and conclusions

Regarding the hypothesis H1, this study demonstrates that there is no gender difference on computer related experience which includes experience with operating systems, the Internet, e-learning, and online library databases. The result is different from other previous researches (Colley, 2003; Fan & Li, 2005; Liaw, 2002). On the other hand, regarding the hypothesis H2, this study demonstrates that gender difference happens on e-learning attitudes that including learners' self-efficacy, extrinsic motivation, and behavioral intention. This result supports the previous researches (Colley, 2003; Fan & Li, 2005; Liaw, 2002; Ong & Lai, 2006).

Regarding the hypotheses H3 and H4, this research is to investigate whether computer related experience is a positive predictor or not on self-efficacy and motivation. The statistical results support previous research (Liaw & Huang, 2003; Mitra, 1998) that computer experience is a positive predictor of e-learning attitudes, including perceived self-efficacy, perceived enjoyment, and perceived usefulness of using e-learning.

According the hypothesis H5, this study demonstrates that self-efficacy and motivation (including enjoyment and usefulness) are significant predictors of learners' behavioral intention of using e-learning. This result also supports previous researches (Liaw, 2002; Liaw, et al., 2006; Moon & Lim, 2001).

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7. References

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