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A STUDY ON THE INFLUENCE OF LEARNER CHARACTERISTICS, EDUCATOR CHARACTERISTICS AND LEARNING STRATEGIES ON LEARNING SATISFACTION IN E-LEARNING

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Abstract

In education, the rise of e-learning has broken the barriers and restrictions of time, space and place in the transmission of old knowledge, and provided a more flexible learning style. Based on the arguments of Alavi & Leidner (2001) and Piccoli et al. (2001), this study examined the relationship between learner characteristics, educator characteristics, and learning strategies in an e-learning environment, and the effects of these three on learning satisfaction. A total of 112 valid questionnaires were collected from 200 questionnaires sent to users of an online teaching system at a university in southern Taiwan. The research results revealed that learner characteristics appeared significantly positive correlations with learning strategies (0.866, $p < 0.01$), educator characteristics presented remarkably positive correlations with learning strategies (0.837, $p < 0.01$), educator characteristics appeared significantly positive correlations with learning satisfaction (0.858, $p < 0.01$), and learning strategies showed notably positive correlations with learning satisfaction (0.842, $p < 0.01$). In previous studies, a positive correlation was found between learning strategies and learning satisfaction, so this study found that the better the use of learning strategies, the higher the satisfaction with e-learning.

Key Words: Learner Characteristics, Educator Characteristics, Learning Strategies, Learning Satisfaction, E-Learning

Introduction

The modern life style is already at the stage of knowledge explosion. The use of network resources accelerates the spread and sharing of knowledge. In education, the rise of e-learning has broken the barriers and restrictions of time, space and place in the transmission of old knowledge, and provided a more flexible learning style. E-learning enables everyone to roam freely in the virtual world and to conduct individu-

alized learning according to learners' needs. This undoubtedly causes the tremendous impact to the traditional teaching methods.

In the past, some educators have formed virtual teams in some fields, hoping to improve the effectiveness of traditional teaching through technical tools (Alavi, 1994; Alavi et al., 1995). The use of computers could improve the interaction between teachers and students in the classroom (Leidner & Fuller, 1997).

According to Lee (2001), there were two key factors to measure the effectiveness of online teaching: the view of learners and the psychological cognitive process. Alavi & Leidner (2001) further argued that, if analyzed from a "student" point of view, previous research has focused on "can IT learning environments improve learning outcomes? ", which would focus on "how different IT learning environments affect students' psychological learning processes and outcomes? " It could be seen from the above researches that more attention has been paid to the process of how learners' psychological state changes in the learning process.

Based on the perspectives of Alavi & Leidner (2001) and Lee (2001), this study was extended to focus on learners' "psychological learning process". In this study, the application of learning strategies was regarded as a psychological learning process. Learning itself was a series of cognitive process changes, so learners could make psychological cognitive changes through the use of learning strategies. Therefore, learners' use of learning strategies was an intermediate process of learning. For learning itself, it is an important key to achieve effective learning. In other words, the individual differences of learners in the learning process would result in different learning outcomes due to the different psychological cognitive states of individuals and the application of learning strategies.

To sum up, this study took learning strategies as mediator in e-learning environment, and explored the role and importance of learning strategy in learning process, as well as the influence of learning strategies on e-Learning satisfaction.

Literature and Research Hypothesis

The Definition of E-Learning

A useful introduction to the various terms used in e-learning is provided by Urdan and Weggen (2000). They defined e-learning as the delivery of learning materials, packages or opportunities (ie content) through various forms of electronic media, including the Internet, intranets, extranets, satellite broadcast, audio/videotape, interactive TV, and CD-ROM. They used e-learning synonymously with technology-based learning or TBT.

The scope of e-learning is very broad, and all those who use different types of information technology as tools or media to achieve learning purposes, such as e-learning (Mbarek & Zaddem,2013; Al-Homod & Shafi,2013), Technology-mediated learning (Alavi & Leidner, 2001), Vir-

tual learning environments (Wilson, 1996; Piccoli et al., 2001), computer-supported group-based learning (Strijbos et al., 2004), distance learning (Beyth-Marom, 2003) and e-learning systems, can be called "e-learning".

Learner Characteristics

Piccoli et al. (2001) proposed a framework in e-learning environments that contains two major dimensions: human dimension and system design dimension. This study examines the relationship between learner characteristics and learning strategies based on the "human dimension" proposed by Piccoli et al. Learner characteristics include:

(1) Learning motivation: In a study by Leidner & Jarvenpaa (1995), maturity and motivation in an e-learning environment have been shown to have a direct correlation with academic achievement. Therefore, it can be inferred that learning motivation also directly affects learning satisfaction.

(2) computer self-efficacy: Compeau & Higgins (1995) extended self-efficacy theory to the use of information technology, and called it "computer self-efficacy". It refers to the self-judgment of whether an individual has the ability to complete a particular task when using a computer. The purpose is not to judge the ability to perform various computer skills, but to assess the level of confidence that the user has to use the computer to complete a task.

(3) prior experience: Piccoli et al. (2001) suggested that in an e-learning environment, prior experience can be seen as a prerequisite for success and will lead to different responsive attitudes, intentions and behaviors of learners. As learners gain experience in the virtual environment, they can develop their own learning strategies in the e-learning environment.

This study hypothesizes that different learner characteristics will have different effects on individual learning experiences and therefore on the use of learning strategies. The following hypothesis is, therefore, proposed in this study.

Hypothesis 1: Learners' characteristics has an impact on learning strategies.

Educator Characteristics

Webster & Hackley (1997) concluded that the educator plays a very important role in learning environment. They also found that educator characteristics such as technology attitude, teaching style, and technology control are all measures that correlate with learning effectiveness. Gregory (2003), in a study on distance learning, also pointed out that there is a high correlation between educators and satisfaction. From the arguments above, it can be found that the influence of educator characteristics in the e-learning environment on the learning process and learning satisfaction is quite important.

In the framework proposed by Piccoli et al. (2001), the researchers reported that the characteristics of educators also influenced learning effectiveness, and mentioned that in previ-

ous studies on IT-based learning environments, some characteristics of the educators have been emphasized to affect the effectiveness of learning. From the arguments above, it can be found that the influence of educator characteristics in the e-learning environment on the learning process and learning satisfaction is quite important.

From the literature, it is hypothesized that learners' learning experiences are influenced differently by the educator characteristics. The educator characteristics in an e-learning environment will influence the learner's use of learning strategies, and the educator characteristics will also influence the level of learning satisfaction. Accordingly, the following hypotheses are proposed in this study.

Hypothesis 2: Educator characteristics have an impact on learners' learning strategies.

Hypothesis 3: Educator characteristics have an impact on learners' satisfaction with e-learning.

Learning Strategies and Learning Satisfaction

Mayer (1987) considered learning strategies as any activity used by the learner to promote learning effectiveness during the learning process. Learning strategies thus encompass all the ways in which learners actively manipulate the flow of information in response to a specific learning goal. Therefore, a learning strategy can be defined as a learner's behavior that affects the learner's processing of information.

According to Piccoli et al. (2001), the measurement of learner satisfaction is very important in an emerging learning environment. Satisfaction can also be used to predict learners' future participation in similar learning styles. As a result, if learners are able to use various learning strategies in an e-learning environment, they will increase their satisfaction with the e-learning environment and will be willing to continue to use it for similar learning. Therefore, "learning satisfaction" was included in the study variables.

This study hypothesized that the use of learning strategies in the e-learning environment would have a certain impact on the effectiveness of e-learning, and if properly used, would lead to better e-learning results and higher learning satisfaction.

The following hypothesis is then proposed in this study.

Hypothesis 4: The use of learning strategies has an impact on e-learning satisfaction.

Method

Research Sample and Object

A total of 112 valid questionnaires were collected from 200 questionnaires sent to users of an online teaching system at a university in southern Taiwan.

Reliability and Validity Test

The questionnaire items in this study are referred to domestic and in-

ternational research that the questionnaire presents certain content validity. Learner characteristics (learning motivation, learning motivation, computer self-efficiency, prior experience), educator characteristics, learning strategies and learning satisfaction in this study are preceded the overall structural causal relationship test; the linear structural relations model analysis results show the overall model fit reaching the rational range that they reveal favorable convergent validity and predictive validity. Item-to-total correlation coefficients are used for testing the construct validity of the questionnaire content, i.e. reliability analysis, and the calculated item-to-total correlation coefficients are used for judging the questionnaire content. The item-to-total correlation coefficients of the dimensions in this study are higher than 0.7, revealing certain construct validity. To further understand the reliability and validity of the questionnaire in this study, reliability and validity analyses are preceded. The higher Cronbach's α reveals the better reliability. The formal questionnaire in this study is developed according to the standard, and the measured Cronbach's α appears in 0.70~ 0.90, apparently conforming to the reliability range.

Empirical Result Analysis

The data results of this study are organized in Table 1.

Table 1. Overall linear structural model analysis result

evaluation item	parameter/evaluation standard		result	t
preliminary fit	learner characteristics	learning motivation	0.688	10.15**
		computer self-efficiency	0.657	8.13**
		prior experience	0.664	8.46**
	educator characteristics		0.701	11.24**
	learning strategies		0.713	12.16**
	learning satisfaction		0.722	13.72**
internal fit	learner characteristics → learning strategies		0.866	33.25**
	educator characteristics → learning strategies		0.837	26.37**
	educator characteristics → learning satisfaction		0.858	29.49**
	learning strategies → learning satisfaction		0.842	27.63**
overall	X^2/Df		1.277	
	GFI		0.975	
	AGFI		0.912	
	RMR		0.006	

Note: * stands for p<0.05, ** for p<0.01, and *** for p<0.001

From Table 1, the three dimensions of learner characteristics (learning motivation, computer self-efficiency, prior experience) achieved the significance (t>1.96, p<0.05); educator characteristics reached the significance (t>1.96, p<0.05); learning strategies achieved the significance (t>1.96, p<0.05), and learning satisfaction reached the significance (t>1.96, p<0.05). Apparently, the overall model showed favorable preliminary fit.

Regarding fit of internal structural of model, learner characteristics appeared significantly positive correlations with learning strategies (0.866, $p < 0.01$), educator characteristics presented remarkably positive correlations with learning strategies (0.837, $p < 0.01$), educator characteristics appeared significantly positive correlations with learning satisfaction (0.858, $p < 0.01$), and learning strategies showed notably positive correlations with learning satisfaction (0.842, $p < 0.01$), revealing H1, H2, H3 and H4 is being supported.

The overall model fit standards $\chi^2/Df=1.277$, smaller than the standard 3, and RMR=0.006 showed proper results of χ^2/DF and RMR. Furthermore, chi-square value was sensitive to sample size that it was not suitable for directly judging the fit. However, the overall model fit standards GFI=0.975 and AGFI= 0.912 were higher than the standard 0.9 (the closer GFI and AGFI to 1 showing the better model fit) that this model presented favorable goodness-of-fit.

Discussion and Conclusions

The research results reveal the positive correlations among learner characteristics, educator characteristics, learning strategies, and learning satisfaction. In other words, learning motivation computer self-efficacy, and prior experience in the learner's characteristics influence learning strategies and further increase learning satisfaction. The better the educator characteristics are, the more they influence the learning strategies used by the learner. The better the characteristics of the educator show, the more positive the experience is for the learner and the higher the e-learning satisfaction. In previous studies, a positive correlation was found between learning strategies and learning satisfaction, so this study found that the better the use of learning strategies, the higher the satisfaction with digital learning.

Due to the development of the Internet, there are many digital learning systems for learners to choose. This study is inadequate because it only focuses on the users of a e-learning system at a university in southern Taiwan. In the future, other e-learning systems can be included in the study to make the results more convincing.

Besides, in this study, only three variables of learner characteristics were discussed: learning motivation, computer self-efficacy, and prior experience; no variables were listed for educator characteristics. However, there are not only three characteristics of learners, and educator characteristics can also be categorized so that more variables can be included in the follow-up study to further understand the important factors affecting learning satisfaction in the e-learning environment, and serve as the basis for improving the design of e-learning curriculum.

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