Investigating perceptions and the intention of museum guides to use navigation learning system

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Abstract: With the rapid development of science and technology, learning is no longer confined to the classroom. The museum is one important source that provides new knowledge for students. When informal learning goes viral along with a variety of occasions or knowledge sources, more and more researches have indicated that the museum learning is a sound manner to achieve it. Thus, providing a guidance to navigate exhibits apparently becomes a key for successful learning in the museum. This study constructed a web-based navigation learning system to assist elderly volunteers navigating the museum's exhibits and to enhance the quality of their guiding service. The study employed technology acceptance model (TAM) to explore the degree of acceptance of the navigation learning system by 48 elderly volunteers. The statistical analysis was conducted and the results revealed that computer using experience and computer self-efficacy has significant positive effect on perceived usefulness and perceived ease of use. On the other hand, the results revealed that computer anxiety has significant negative effect on perceived usefulness and perceived ease of use. In addition, the results demonstrated that perceived usefulness and perceived ease of use have significant positive effect on intention to use the system for elderly volunteers.

Keywords: Informal learning, Web-Based Learning, Technology Acceptance Model

1. Introduction

In recent years, due to rapid technological development, learning is no longer confined to the classroom (Huang, Chiu, Liu & Chen, 2011). For example, students may acquire knowledge outside of the classroom where informal learning happens in such places as botanical garden, museums, cinema and etc. Thus, there are many novel way of learning emerged recently, which has received a great attention of many researchers (Lin, Lin & Huang, 2011; Huang & Wu, 2011). One of the important sources for providing new knowledge for students is the museum. Museums have several resources related to nature and culture; hence it can promote social experience, learning, and leisure of students. Therefore, the museum plays an important role in informal learning (Paris & Hapgood, 2002).

There are several major factors that need to be considered to make the museum attractive for visitors. One of them is professionalism of museum's guides who is capable to provide dynamic and interactive services that can inspire visitors' motivation to learn about exhibits. Falk & Dierking believed that the staff of the museum becomes capable to

provide a positive influence on tourists after a good training (Falk & Dierking, 2000). Furthermore, in order to satisfy with more professional and rich services, museums need new perspectives and practices to train guides (Hurst, 1995), for example, successful navigation to convey the complete knowledge to visitors. Furthermore, most guides are elderly people, and therefore, it's an important issue how to increase the quality of guiding service.

Web-based learning can bring more advantages comparing to traditional learning, which cannot be subjected to such constraints as time or space (i.e. asynchronous learning) (Anido, Llamas & Fernandez, 2001). Moreover, based on the characteristics of repetition learning, learners can enhance the knowledge and skills among the learning process, which also has been gaining popularity (Chen & Macredie, 2004). In the past, most research in WBL is based on hypertext design. According to hypertext, educators can design adaptive learning form learner's learning path (Lo, Chan & Yeh, 2012). Meanwhile, Kearsley thought that information can be easily reached shared with the aid of computer and technology (Kearsley, 1999).

This study developed a web-based navigation learning system to assist elderly volunteers navigating the museum's exhibits and to enhance the quality of their guiding service. This system dynamically provides related to exhibits knowledge for guides using this system. This system can provide a guide to acquire more knowledge and skills in the repeated learning. Overall, the focus of this study is that elderly volunteers cannot be limited by time and space to carry out simulation learning, self-training, self-testing, and discussion of issues related to guiding with others while using the system. Besides, this study expected to enrich elderly volunteers with the professional knowledge and interpretive skills that satisfy their personal learning and needs.

This study provides the navigation learning system and the volunteers guides participated in complete and professional training. Most of participants are elderly people and this study aimed to investigate their acceptance of the navigation learning system by applying questionnaire survey and a technology acceptance model (TAM). Moreover, the study investigated the effects of the external variables on intention to use the system.

2. Navigation training learning system

This study used Xtended Object Oriented Portal System (XOOPS) framework to develop learning system, which provided a dynamic web content management function. The system provides member login, main menu, multimedia, and website link features which are shown in Figure 1.

Figure 1. Navigation learning system

This system is designed for the Botanical Garden of the National Natural Science Museum. The design of the navigation learning system is based on Self-directed Learning Model (Garrison, 1997). The main function of this system is a member area, simulation learning of a guide, experts' video demonstration for guide and discussion forums. Figure 2 shows the overall system architecture, each function is described as follows.

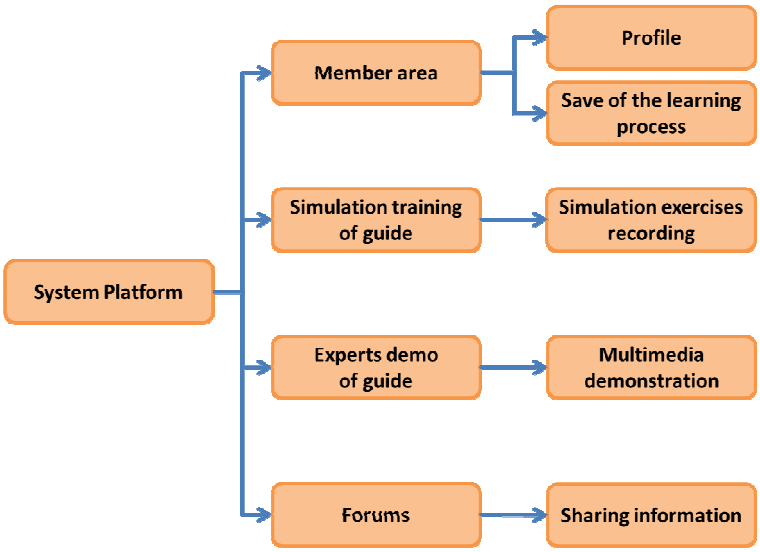

Figure 2. Architecture of Guide Training Learning System

In this system, the main feature is online Virtual Showcase simulation function, which provides exhibition for a guide through simulation learning. A guide can use Quick Time VR to watch expert's video demonstration for proper guiding. Through the system, a guide can understand different characteristics of Pineapples, such as growth habits, plant structure. Moreover, this system with Wink screen recording capabilities provides a guide with simulation exercises. The Virtual Showcase simulation function displays in Figure 3.

Figure 3. The Virtual Showcase simulation function

Moreover, a guide can use the function of member area to manage personal information and upload personal training video to share with other people. All member are able to download video and view the way of navigation, and consider whether this video needs improvement or not. Meanwhile, a guide also can communicate with other members

through forums, e.g. discuss demo-videos, ask questions, and answer questions.

3. Research methodology

3.1 Sample

This research was proposed a navigation learning system, and investigated the degree of acceptance for guides to use this system. Moreover, a case study of the exhibition about pineapple was administered in this study. All of the pineapples in the exhibition were grown in the green house, which is located in the Tropical rainforest environment. Participants in the study were 48 members (14 males and 34 females). Their age was between 30 and 50 years and they were employed as the museum guides.

3.2 Measures

This study conducted 15 mandatory sessions during three weeks regarding the aim of this study and about operation of the system. After the sessions the questionnaire survey was administered. The questionnaire includes six dimensions. All items of the questionnaire were validated by the experts before the study. A five-point Likert scale was employed to measure responses of participants.

3.3 Measures of TAM

Technology acceptance mode (TAM) first proposed by Davis in 1986 (Davis,1989), which according to the Theory of Reasoned Action (TRA) (Fishbein & Ajzen,1975) effectively explains and predicts an user's perceptions regarding information system and an user's behavioral intention to use the system.

TAM variables are External Variables (EV), Perceived Ease Of Use (PEOU), Perceived Usefulness (PU), Attitude Toward using System (AT), Behavioral intention (BI) and Actual System Use (ASU). The TAM was modified by many researchers continuously, which resulted into TAM2 model (Davis & Venkatesh, 2000). TAM2 removes the "attitude" variable, and proves users' perceived usefulness direct impact on degree of acceptance the new technology. Noteworthy, the past research confirmed that perceived ease of use will directly affect the user's perceived usefulness. However, perceived ease of use has indirect effect on behavioral intention but thought perceived usefulness.

According to the related literature, perceived usefulness and perceived ease of use are the most influential variables for evaluating technology acceptance behavior. Therefore, this study takes the revised technology acceptance model as a research framework and theoretical foundation. Meanwhile, according to the relevant literature, the Technology Acceptance Model 2 (TAM2) includes external variables (i.e. computer using experience, computer self-efficacy, and computer anxiety). In this study, the external variables and amended architecture model are shown in Figure 4.

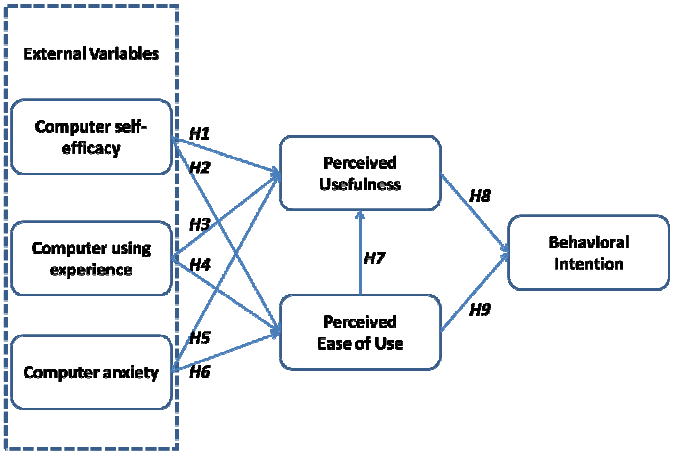

Figure 4. Technology Acceptance Model 2

According to the research framework, this study proposes 9 hypotheses.

- *H1*: Computer using experience has positive effect on participants' perceived usefulness of the navigation learning system.
- *H2*: Computer using experience has positive effect on participants' perceived ease of use of the navigation learning system.
- *H3*: Computer Self-efficacy has positive effect on participants' perceived usefulness the navigation learning system.
- *H4*: Computer Self-efficacy has positive effect on participants' perceived ease of use of the navigation learning system.
- *H5*: Computer anxiety has negative effect on participants' perceived usefulness of the navigation learning system.
- *H6*: Computer anxiety has negative effect on participants' perceived ease of use of the navigation learning system.
- *H7*: Cognition perceived ease of use has positive effect on participants' perceived usefulness of the navigation learning system.
- *H8*: Cognition perceived ease of use has positive effect on participants' intention to use the navigation learning system.
- *H9*: Cognition perceived usefulness has positive effect on participants' intention to use the navigation learning system.

4. The results

The results of the reliability analysis indicate that coefficient of Cronbach's α is between 0.735 and 0.949 (Table 1). All of the coefficients of Cronbach's α are greater than the standard value (0.7), that is, the questionnaire has achieved internal consistency reliability.

Table 1. Reliability analysis

Satisfaction Dimensions	Cronbach's α
Computer using experience	.913
Computer Self-efficacy	.890
Computer anxiety	.735
Perceived usefulness	.949
Perceived ease of use	.905
Intension of use	.864
Scales analysis	.919

In order to understand relationship between computer using experience, computer self-efficacy, computer anxiety, perceived usefulness, perceived ease of use, and behavioral intention to use the system the study administered the regression and path statistical analyses. The results of the analyses are shown in Figure 5.

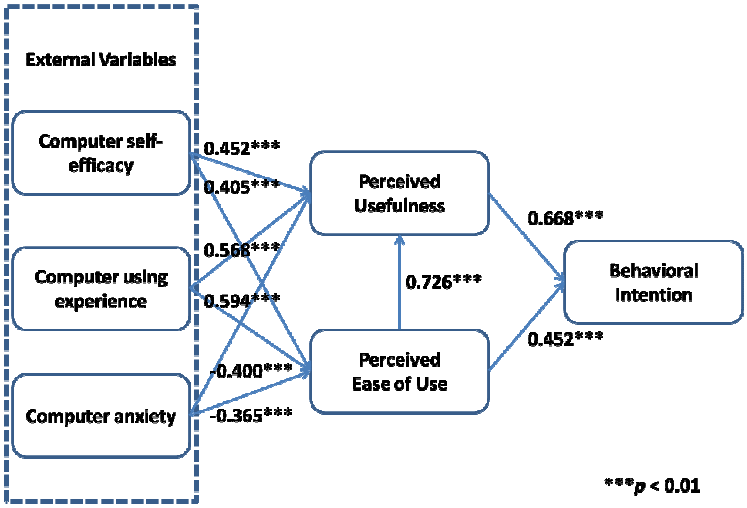

Figure 5. Path coefficients analyze

The results show that computer self-efficacy has a strong direct effect on perceived usefulness and perceived ease of use (β=0.57 and β=0.59). This relationship of computer using experience has direct effect on perceived usefulness and perceived ease of use (β=0.45 and β=0.40). Although the effect of computer anxiety on perceived usefulness and perceived ease of use is negative (β=-0.4 and β=-0.37). Perceived ease of use has positive effect on perceived usefulness (β=0.73). Perceived ease of use and perceived usefulness have positive effect on intention to use (β=0.57 and β=0.668). The most significant is the effect of perceived ease of use on perceived usefulness that can explain the factor which effect user to use the system. The second factor is effect of perceived usefulness on intention to use. The third factor is effect of computer self-efficacy on perceived ease of use.

5. Conclusion

This study revealed that the external variables (computer experience, computer self-efficacy, and computer anxiety) have significant effect on perceived usefulness and perceived ease of use. Perceived ease of use has positive and significant impact on perceived usefulness. Meanwhile, the perceived ease of use and the perceived usefulness has positive and significant impact on behavioral intention. This suggests that computer using experience and self-efficacy of elderly guide volunteers have a positive and significant impact on perceived ease of use and perceived usefulness. However, as most of the participants are elderly guide volunteers, this study recommends increasing the time of computer courses in the future to reduce the users' computer anxiety. Furthermore, regarding the future work, researchers can add open-ended items as well as advice column to the questionnaire in order to gather additional comments on how to improve the navigation learning system.

Acknowledgements

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