World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:8, No:6, 2014

The Determinants of Senior Students' Behavioral Intention on the Blended E-Learning for the Ceramics Teaching Course at the Active Aging University

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Open Science Index, Educational and Pedagogical Sciences Vol:8, No:6, 2014 publications.waset.org/9998575.pdf

***Abstract*—**In this paper, the authors try to investigate the determinants of behavioral intention of the blended E-learning course for senior students at the Active Ageing University in Taiwan. Due to lower proficiency in the use of computers and less experience on learning styles of the blended E-learning course for senior students will be expected quite different from those for most young students. After more than five weeks course for two years the questionnaire survey is executed to collect data for statistical analysis in order to understand the determinants of the behavioral intention for senior students. The object of this study is at one of the Active Ageing University in Taiwan total of 84 senior students in the blended E-learning for the ceramics teaching course. The research results show that only the perceived usefulness of the blended E-learning course has significant positive relationship with the behavioral intention.

***Keywords*—**Active Aging University, blended E-learning, ceramics teaching course, behavioral intention.

I. Introduction

GRADULLY, Taiwan has become an aging society and senior populations in Taiwan until 2010 reached 10.7% of all population [1]. It predicts that the proportion of the population in 2018 will reach 14.8%, the proportion of Taiwan's senior population will be as high as 22.7% in 2028and it will become the super-aged society [1]. Of course, with the rapid growth of the senior population in Taiwan the senior educational institutions are also booming development, such as cities and counties have set Elderly Learning Resource Center,

Evergreen Academy, Community College, Air University (specially) aging learning center for elementary and junior-high school attached to all kinds of supplementary schools. There is important to promote senior citizens to live and learn older and activate lifelong learning opportunity. The Ministry of Education in Taiwan is in response to the impact of the aging society and considers lifelong learning as an important vision. And also it integrates information technology into life as an important goal of the society for the senior citizens.

In recent years, Taiwan's Ministry of Education supports many universities to open the Active Ageing Universities. The main purpose is to expect that through the integration and sharing of the resources of the school it provides senior citizens in the community to be able to enter the University for lifelong learning. It will include information technology applications and new life development courses. The main purpose is to implement the senior citizens healthy, independent and happy learning [1]. Furthermore, according to the survey of the Ministry of the Interior in Taiwan it pointed out that in the population over the age of 65 will use the computer to only 6.67%. Although most of the elders use computers and the Internet are not so high but in order to let the senior citizens get into the Internet Road the government unit try through Evergreen Academy, Senior Learning Center to offer many computer courses for senior citizens to learn by their enthusiastic response. Therefore, the demand for computer network technology is urgent. But the process of teaching computer courses can not be completely in accordance with the method of teaching for most young students in the past. Of course, it can not just consider the content and methods of teaching [2]. And also it should be aware of the relevant factors that affect the information technology tools, learning computer courses to senior citizens to eliminate the barriers to entry of the information technology, sustainable learning and learn the real application in life.

Of course, it is to explore the integration of information technology into teaching at the past. In the most of the research it is still using the technology acceptance model as its foundation. By using the concept of the Technology Acceptance Model, the majority objects are still younger students to explore. Such as, Chang, et al [3] applied the behavior of action learning platform in the use of English teaching courses for high school students. Cheng et al. [4] also explored the use of digital learning system for the education and training for members of the organization. And Lin [5] discussed the adult learners how to continue use of digital learning systems and Teo [6] used the technology acceptance model explored the teachers in the use of digital learning acceptance. Therefore, this study in order to understand the determinants of behavioral intention for senior students at the Active Ageing University on computer application courses on the acceptance factors. It imports the technology acceptance model to be explored. Therefore, based on arguments of the research, the study proposes the following research questions to investigate the senior students of the Active Ageing University in the blended E-learning system to earn ceramics teaching courses whether it will enhance its intention to use.

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II. Literature Review and Hypothesis Discussion

Davis et al. [7] suggested the Theory of Reasoned Action (Theory of Reasoned Action, TRA) to amend and propose the Technology Acceptance Model that simplified into perceived usefulness and perceived ease of use two external variables and factors of influence attitudes. Davis et al. [7] decided mainly by the perceived usefulness and perceived ease of use that use attitude will directly affect behavioral intentions thus directly affect the use of the system and attitude. Therefore, part of the model to remove the subjective norm develops the technology acceptance model. Technology acceptance model essentially included perceived usefulness and perceived ease of use of these two beliefs are important factors of the computer to accept behavior.

Many empirical studies have confirmed Technology Acceptance Model that the continued use of the user's own intention by the perceived usefulness and ease of use impact. The higher the relative ease of use will affect its perceived usefulness and then through continuing use intention practical for the adoption of the information technology. Since Davis et al. [7] proposed the Technology Acceptance Model many information technology adoption behavior studies using this model explain the behavior of personal use of information technology [8], [9]. Therefore, according to the view of the Technology Acceptance Model, this study proposes the following hypothesis:

H1: Perceived usefulness for senior students to the behavioral intention of the blended E-learning for ceramics teaching course will have a positive impact on the relationship

H2: Perceived ease of use for senior students to the behavioral intention of the blended E-learning for ceramics teaching course will have a positive impact on the relationship

H3: Perceived ease of use for senior students in the blended E-learning for ceramics teaching course to perceived usefulness will have a positive impact on the relationship.

III. Research Design and Methods

A. Measure of the Design and Research Framework

According to the above discussion, the authors suggest that perceived usefulness, perceived ease of use and intention to use of senior students in the blended E-learning for ceramics teaching courses. Fig. 1 presents the research model based development in accordance with its previous literature. Before formal questionnaire analysis, this study experts validity testing in order to detect the initial content validity of the questionnaire to do that through two university professors in the field of information management department. Scale design for technology acceptance model, perceived usefulness and perceived ease of use and intention to measure questions that was modified from Davis. Finally, all of the measurement items are using the Likert 5-point scale.

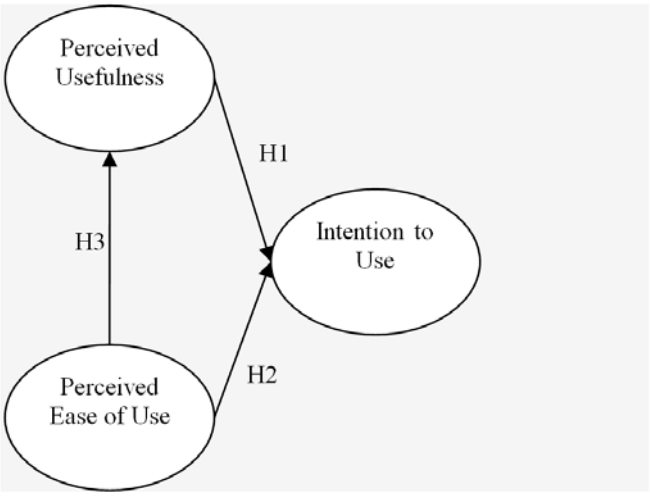

Fig. 1 Research framework

B. Experimental Design and Object

In this study, using a single group posttest experimental design (one-group posttest-only design) the authors selected a group of subjects involved in the blended E-learning for ceramics teaching courses to experiment. The objects of study are all the senior students of the Active Aging University in the southern of Taiwan so that the use of scale to collect the data of this study constructs to validate the model proposed in this study. The objects are 44 and 40 (total 84 for two years) senior students, returning the questionnaires are up to 62, the main distribution of ages between 60-70 years old (total approximately 92.1% of the sample). While men accounted for 44.2% and 55.8% for women, the objects of the study have the majority of computer experience no more than one year (73%).

C. Experimental Process

There was not so much experience to use the computer as well as to study in the blended E-learning for ceramics teaching courses before. The authors illustrate the use of online course platform and process for senior students previously then let all the students of the Active Ageing University at their home themselves to learn the E-learning courses. In this study, in order to ensure that the participants will be able to effectively actual study of the E-learning system so that students actually have learned the five weeks course continuously. The course is of three hours per week and after the end of the last blended E-learning program the authors let senior students base on their own feelings to answer the every question. There is no standard answer. According to their own feeling, they will fill answer for the every question. The steps of the relevant experimental process are showing in Table I.

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TABLE I
EXPERIMENTAL PROCESS FOR TWO YEARS (TWICE)

Stage	Place	Process	Time
Course introduction	Classroom	1.The semester curriculum design and implementation	10min.
		2.Description of the semester teaching process as well as the E-learning platform to use	10min.
		3.Features of the E-learning platform and applied to teaching	100min.
		4.Initial use of the E-learning platform for digital learning and interactive learning	30min.
Real teaching and E-learning	Any place	1.Involved be suggested according to their own pace and time requirements for the physical classroom and the E-learning platform	5 weeks
Fill answer for questionnaire	Classroom	1. Participants use the E-learning platform to the last day of classes. 2. Fill answer for each question and fill out the consent of answers for everyone.	30min.

D. Common Variance Bias

In addition, this research has taken procedural remedies to mitigate possible common method biases. The suggestions of Tourangeau et al. [10] were applied to construct the questionnaire items to reduce method biases. The expert review described earlier also served to assist this purpose. Reminding respondents to answer questions as honestly as possible by assuring them there were no right or wrong answers would also help reducing common method biases [11].

IV. DATA ANALYSIS AND RESULTS

A. Analysis of the Measurement Mode

In this study, the analysis tool is SmartPLS 2.0 (M3). Unlike the first generation of the regression analysis, structural equation model is suitable for predicting the highly complex mode method [12]. However, structural equation modeling software mainly can be divided into two types, namely the covariance matrix component-based approach, covariance matrix based mainly LISREL with AMOS and ingredients based mainly PLS (Partial Least Square) [12]. The PLS can be processed to form the Formative with the Reflective indicators. Unlike general covariance matrix estimated structural Formula software, such as LISREL or AMOS, it is only the processing of the model of the reaction formula indicators [12].

In this study, the authors use the PLS software for the analysis of this main structural equation model because: (1) Compared with LISREL the PLS is more relaxed restrictions for sample and sample distribution that do not need the normal distribution [13], [14] (2) In the structural model those do not need to have a strong theoretical foundation to support Confirmatory and Exploratory studies and unlike LISREL strong theoretical foundation is necessary before empirical[13], [14]. Therefore, in the measurement and structural model testing of the present study the authors use the method of PLS Bootstrap 500 for model checking.

The confirmatory factor analysis is used to test the measurement mode. The assessment of the measurement mode analysis is used structural equation modeling PLS (Partial Least Squares) for model validation. Considerations on the PLS do not require multivariate normal distribution (Multivariate Normal Distribution) also do not need to consider the large sample measurement to be estimated using the least squares method to estimate [12], [15].

The assessment criteria of internal consistency (Internal Consistency) are mainly based on composite reliability (Composite Reliability, CR) and Nunnally [15] suggested as the measurement. However, in this study, the composite reliability ranged from 0.910to 0.923, the results were consistent Bagozzi & Yi [12]CR> 0.7. Convergent validity refers to the measurement of a single construct multiple projects. When all constructs the value of the average amount of variance extracted (AVE) are greater than the recommended value threshold of 0.5the average variance extracted measure in this study ranged from 0.701 to 0.951are greater than the recommended value. Factor loadings are all measurement items significantly and are higher than the recommended value of 0.5 [15]. The above analysis shows the potential variables in this study that the measurement mode is with good convergent validity. The reliability test results are shown in Table II.

TABLE II
AVE AND CR VALUES OF THE TEST RESULTS

Construct	Item	Loading Factor	Composite Reliability (CR)	Average Amount of Variance Extracted (AVE)	Cronbach Alpha
Perceived usefulness	PU1	0.951	0.910	0.904	0.979
	PU2	0.898			
	PU3	0.855			
Perceived ease of use	PEU1	0.968	0.923	0.701	0.944
	PEU2	0.966			
	PEU3	0.938			
Behavioral intention	ITU1	0.823	0.913	0.951	0.969
	ITU2	0.900			
	ITU3	0.973			

The discriminant validity is the inspection and measurement variable for the identification of the different constructs. Each construct is greater than the value of the square root of the average variance extracted amount between different measurement constructs between the correlation coefficients [12]. According to the analysis of the results the average variance extracted square root value is greater than the correlation coefficient between the constructs. Obviously, the results of each construct have its discriminant validity. The relevant discriminant validity of the results is shown in Table III.

TABLE III
DISCRIMINANT VALIDITY OF THE TEST RESULTS

	Behavioral intention	Perceived ease of use	Perceived usefulness
Behavioral intention	**0.974**		
Perceived ease of use	0.533	**0.837**	
Perceived usefulness	0.440	0.566	**0.950**

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B. Structural Model Analysis

The structural equation model analysis is used to explain the study hypothesis each dimension of the estimated path coefficients between the concepts is used to explain the relationship between the independent variables and the dependent variable. On the other hand, the structure of the model can also be used to view the dependent variable, the overall explanatory power (R-square). In this study, however, it is the use of Bootstrap's Resample estimate PLS on each structure among the estimates [12]. In this study, the results of the structural model analysis, hypothesis 1&3(hypothesis 2 is not) respectively, are in line with statistical hypothesis. With this result, only the perceived usefulness of the blended E-learning has significant relationship with the behavioral intention. Finally, the structure model explains up to 0.588, and 0.450 percent of variance respectively. Research hypothesis test results are shown in Fig. 2 and Fig. 3.

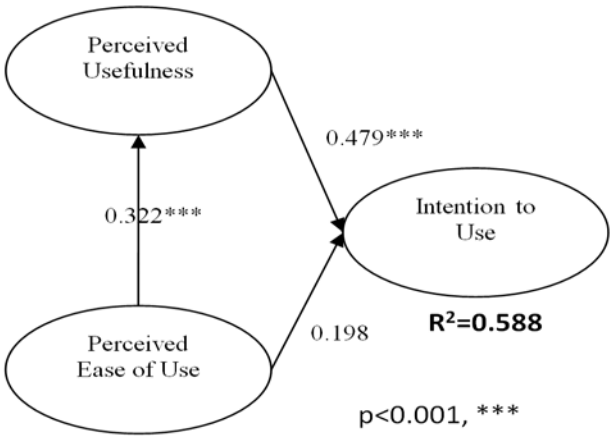

Fig. 2 Result for research framework

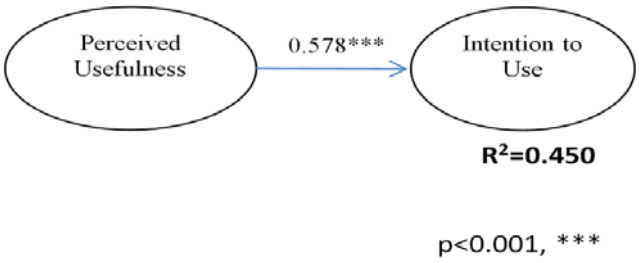

Fig. 3 Relationship of perceived usefulness and intention to use

V. Discussion and Conclusion

A. Discussion and Conclusion

According to the results, only the perceived usefulness have significant impact on behavioral intention to use. This result is different with past studies of the Technology Acceptance Model [9] for most young students. This result represents in the blended E-learning course, if teachers intend to perform the blended E-learning teaching for senior students in the future. Firstly, we must strengthen the ease of use of the interface of system and platform. Finally, because of the relative simplicity of the interface design for platform senior students learning intention will be improved.

B. Limitations of the Study and Future Research Directions

This study is based on senior students as the research object sat one of the Active Ageing University in Taiwan. Through the issuance of the questionnaire it is tried to reduce the impact of regional differences but the main recovery still based on students with specific regions. Therefore, the results may be not applicable to explain the blended E-learning behavior of all the senior students in Taiwan. This is one of the limitations of the research. Secondly, although the design of this research of the present study is a longitudinal section survey that is collect data for two years the samples are not so many as good statistical analysis required. Therefore, In order to do the follow-up procedure of this study if the enough data can be collected it will be not only to help to predict the beliefs and behaviors of senior students but also will increase the understanding of the cause and effect relationship between all the variables.

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