Factors Influencing Students' Attitudes to Computer Utilization in Tertiary Institutions: An Exploratory Study

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ABSTRACT

Students today need to have computer knowledge and skills to enable them perform their task at school and their jobs. This presents a challenge to universities on how to provide computer education to their students. This challenge is even more critical for students in developing countries. Few studies have been done on attitude of students' use of computers in a university environment using a well-grounded technology acceptance mode. The purpose of this study is to find the factors that influence student attitude in the acceptance and use of computers in tertiary institutions in emerging economies using the Theory of Planned Behavior Model.

Keywords: Factors, Computers, Students, Attitude, Challenge.

INTRODUCTION

A Country's economic and technological development can be accelerated by improvements in the training and use of computers. Computer technology now fuels the global market and is the driving force in the growth of developed economies*.* It is now generally accepted that computer skill is an important enabler of growth through increased productivity and the creation of opportunities. This is not the case with developing economies*.* Tertiary institutions provide broad computer training for the industry. This presents a challenge to universities on how to provide the necessary computer education to their students. This challenge is even more critical for students and institutions in emerging economies.

 Numerous studies have been conducted on student use of computers in developed countries, but few studies have been done on factors that influence students' use of computer in tertiary institutions in developing countries. None has researched the attitude of students' use of computers in a university environment using a well-grounded technology acceptance model. The purpose of this study is to find the factors that influence student attitude in the acceptance and use of computers in tertiary institutions in emerging economies such as Nigeria, using the Theory of Planned Behavior Model. This Model will be used in order to ascertain factors such as ability, knowledge, resources and time to learn. The result of this study will give us an insight to students' attitude in accepting computers in developing countries and compare it in future research studies to those of students in advanced countries.

This paper is organized as follows: Introduction, then Literature Review which examines other studies on the subject. The section on Theoretical Frame describes some technology acceptance models, including the technology model and the hypotheses used in this study. The next section, Methodology, describes how data was collected. Result section, presents data analysis, while the next section discusses data interpretation and implication, and finally the conclusion.

LITERATURE REVIEW

Education prepares society for interaction within the social, economic and cultural domains of daily life, (Olaniran & Agnello, 2008). Demands of the modern global age require people and institutions to continuously acquire new knowledge and skills, (Haddad & Drexler, 2002). Oxfam Education Report, (2002), stated that computer skills provide teachers and students great opportunities in teaching and learning, thus improving the quality of teaching and learning in High Schools and Universities. It also brings flexibility in to Institutions and method of delivery of course materials. It is a known fact that students with a prior access to computers tend to enter universities with positive attitudes toward computers, (Ramayah et al., 2005). The workforce must be computer skilled in order to reap the benefits of this new tool. Globalization implies that the whole world is viewed as a single market place in the acquisition, utilization and development of computer skilled professionals, (Badamas, 2002*).*

The new economic order makes it necessary for developing countries to develop a national policy and society that place a high value on computer education and training, since computer is now an integral part in the learning and teaching process, (Mitra, 2000). In some developing countries, computer professionals are expected to be produced through the process of education, training, and continuing education, (Badamas, 2005). Students today, need to have computer knowledge and skills to enable them perform their task at school and at their jobs, (Kirby et al., 2002*).* Students' attitude towards computers is an important factor in influencing their acceptance of computers for their studies and use, (Palaigeorgiou et al., 2005). Computer attitude can be defined as a person's positive or negative feeling towards computer related activities, (Smith, Caputi & Rawstone, 2000). The intention to use or not to use the computer affects an individual's attitude toward the computer and has a great impact on the use of computers, (Bakr & Samira, 2011). Attitudes, skills and practice are interrelated variables, (Chen et al., 2006).

THEORETICAL BACKGROUND

A person's behavior can be determined by intentions, (Fishbein & Ajzen, 1975), and an individual's attitude toward the computer has a great impact on his intentions to use or refuse to use computer. There are many Acceptance models that have been developed and published in the study and research on Information Technology Acceptance, (Compeau & Higgins, 1995; Goodhue, 1995; Goodhue & Thompson, 1996; Leonard-Barton & Deschamps, 1988). Some of these models include the Theory of Reasoned Action (TRA), introduced by Ajzen and Fishbein in 1980, and further expanded as the extended Theory of Reasoned Action. TRA model is used to predict a wide range of behaviors. It is stated that an individual's beliefs influence their attitude and behavior, and that people who are important to him or her influence his or her behavior, (Fishbein &Ajzen, 1975).

The core constructs of TRA are Attitude toward Behavior and Subjective Norm. Technology Acceptance Model (TAM), (Davis et al., 1989) is a technology acceptance model designed to predict information technology acceptance and usage. The core constructs of TAM are Perceived Ease of Use, Perceived Usefulness and Subjective Norm. Although TAM is a robust and widely used model, it can only predict technology adoption cases successfully between 30% (Meister & Compeau, 2002), and 40% of the time, (Venkatesh & Davis, 2000). The Theory of

Planned Behavior (TPB) (Ajzen, 1991) is an extension of the Theory of Reasoned Action by adding Perceive Behavioral Control as an additional construct to TPB. Perceived Behavioral Control, Subjective Norm and Attitude are the main constructs of the Theory of Planned Behavior.

Figure 1: Theory of planned behavior model.
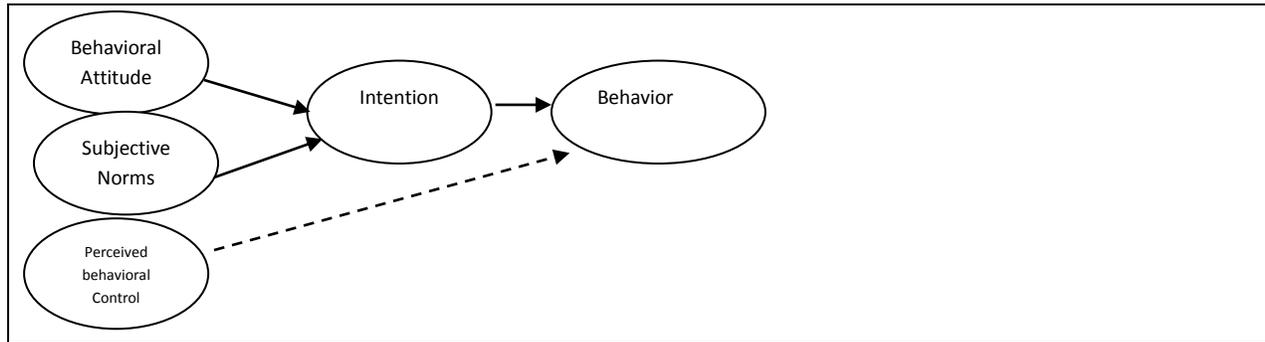
The Theory of Planned Behavior (TPB) as shown in figure 1, states that the combination of three constructs: Attitude toward Behavior, Subjective Norm and Perceived Behavioral Control lead to the formation of a Behavioral Intention. Attitude can be defined as a person's positive or negative evaluation of objects, situations or persons, (Aiken, 1996). Subjective norm is defined as an individual's perception of social normative pressures, or relevant others' (parents, friends, etc.) beliefs that he or she should not perform a particular behavior. Perceived Behavior Control refers to an individual's perceived ease or difficulty of performing a particular behavior, (Ajzen, 1991).

In the context of this study, it is hypothesized that three factors; Behavioral Attitude (BA), Subjective Norms (SN) and Perceived Behavioral Control (PBC) together predict attitude towards students' Behavioral Intention (BI) in the acceptance and use of computers in tertiary institutions in a developing country such as Nigeria. Stated in a formula, this relationship can be expressed as displayed in Figure 2.

Figure 2: Relationship equation.

$$B \text{ (Behavior)} = w_1 BI \text{ (Behavioral Intention)}$$

$$\text{Behavioral Intension (BI)} = w_2 BA + w_3 SN + w_4 PBC$$

This leads to the following hypotheses:

Hypothesis   1:   Attitude toward Behavior is significantly and positively correlated with the intent to use computers.

Hypothesis   2:   Subjective Norm is significantly and positively correlated with the intent to use computers.

Hypothesis 3: Perceived Behavioral Control is significantly and positively correlated with the intent to use computers.

METHODOLOGY

To collect data, a survey instrument was designed. The survey instruments were given to the students which they completed and they were interviewed. The questions range from basic demographics to statements that measure Ajzen's Theory of Planned Behavior. The data was analyzed using the constructs of Ajzen's Theory of Planned Behavior. Participants in this study were 212 students enrolled at the university. The number was made up of male and female students. There were 169 responses, which is about 80%, considered good for analysis (Babbie, 2001).

A six-point Likert scale ranging from Strongly Agree to Strongly Disagree was used for their response. Cronbach's alpha, Correlation Matrix and Hierarchical regression were used to calculate Reliability and Validity. Data was analyzed for Pearson's correlation analysis and hierarchical regression analysis using SPSS 17.0. Regression analysis was performed to establish the degree to which latent variables predict behavior intention and acceptance, and hierarchical regression is used because it allows for specification of the order of entry of variables based on theory and previous studies.

The following questions were used to measure the attitude of students in the use of computers.

Behavioral Attitude

Attitude towards the use of computers was measured using three statements:

> ATT1: Using computer is a good idea
> ATT2: Using computer is a positive idea
> ATT3: Using computer is a helpful idea

Subjective Norm

Subjective Norm construct was measured with the following questions:

> SN1: My professors influence me in my decision whether to use computers
> SN2: My friends influence me in my decision whether to use computers
> SN3: Other people important to me influence me in my decision whether to use computers

Perceived Behavioral Control

The following four statements were used to measure Perceived Behavioral Control:

> PBC1: I have the ability to use computers
> PBC2: I possess enough knowledge to use computers

PBC3: I have the resource to use computers
PBC4: I have the time to use computers

Behavioral Intention

Behavioral Intention was measured using these three questions:

BI1: I intend to use computers in the next three months
BI2: I plan to use computers in the next three months
BI3: I anticipate I will use computer in the next three months

RESULTS

Each construct showed Cronbach alpha greater than 0.7, which showed the instrument is reliable and valid (Santos, 1999).

Table 1: Computed Cronbach Alpha for Each Construct.

Construct	Value
Attitude	.892
Subjective Norm	.706
Perceived Behavioral Control	.717
Behavioral Intention	.818

The result of Pearson's correlation (Table 2) shows correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlation matrix.

	Attitude	Subjective Norm	Perceived Behavioral Control
Behavioral Intention	.337*	.451**	.428*
Attitude		.283	.368*
Subjective Norm			.525**

The Durbin-Watson test is used to check serial dependence. The result of this test (d=2.204) fall within the accepted range 1.5 - 2.5 (Tabachnick et al., 2000). We could also observe the change

in R2 as each independent variable is entered into the model. In this way, we can determine whether additional variables are significant when entered into the equation.

Table 3: Hierarchical Regression Analysis using ATT, SN, and PBC.

Predictors (Constants)	R	R^2	Sig. F change	Durbin-Watson
ATT	.428	.183	.010	
ATT, SN	.484	.234	.014	
ATT, SN, PBC	.539	.290	.013	2.204

The resultant model was found to be statistically significant because results from the study show that the predictor variables, (Attitude, Subjective Norm, and Perceived Behavioral Control) are of statistical significance. Empirical support was found for the three proposed hypothesis:

Hypothesis 1 is supported. The correlation between Attitude and Behavioral Intention is +.337. In the hierarchical equation, Attitude was loaded first and explained 18.3% of the variance in Behavioral Intention. This shows that Attitude is significantly and positively correlated with the intent of students to use computers.

Hypothesis 2 is supported. Correlation between Subjective Norm and Behavioral Intention is +.451. Subjective Norm was entered next into the hierarchical regression equation, and the total variance intentions explained increased to 23.4%. It shows that Subjective Norm is significantly and positively correlated with the intent of students to use computers.

Hypothesis 3 is supported. The correlation that was run between Perceived Behavioral Control and Behavioral Intention is +.428. Perceived Behavioral Control was the last to be entered into the hierarchical regression equation and the total variance in intentions increased to 29%. It shows that Perceived Behavioral Control is significantly and positively correlated with the intent of students to use computers.

 Table 1 to Table 3 summarize that students generally have a positive attitude to the use of computers though in varying degrees.

Table 4 provides a descriptive analysis of the students' perception regarding Subjective Norm. It shows that students tend to strongly agree that they are strongly influenced by others who think they should use Computers.

Table 4: Descriptive statistics for subjective norm toward using computers.

Questionnaire Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	STD
SN 1: My professors influence me in my decision whether to use a computer	97%	_	_	2.9%	_	1.08	.51
SN2: My friends influence me in my decision whether to use a computer	60%	40%	_	_	_	1.4	.49
SN3: Other people influence me in my decision whether to use a computer	94%	2.9%	_	2.9%	_	1.1	.53

Interestingly, the descriptive analysis in Table 5 suggests that students do not strongly agree that they have the ability or knowledge to use computers, though to some the resources are available.

Table 5: Descriptive statistics for perceived behavior control.

Questionnaire Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	STD
PBC1: I have the ability to use a computer	60%	31.4%	5.7%	2.9%	_	1.51	.74
PBC2: I possess enough knowledge to use a computer	20%	71%	2.9%	2.9%	2.9%	1.97	.79
PBC3: I have the resources to use a computer	17.1%	80%	2.9%	_	_	1.88	.53
PBC4: I have time to learn how to use a computer	62.9%	25.7%	8.6%	2.9%	_	1.2	.58

Table 6 provides the descriptive analysis for Attitude. Again, the students tend to strongly agree that computer is a positive idea and useful. They believe that computers will help them in their work.

Table 6: Descriptive statistics for attitude.

Questionnaire Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	STD
ATT1: Using a computer is a good idea	94.3%	2.9%	_	2.9%	_	1.11	.53
ATT2: Using computer is a positive ideas	85.7%	11.4%	_	2.9%	_	1.2	.58
ATT3: Using a computer is a helpful idea	85.7%	11.4%	_	2.9%	_	1.2	.58

Table 7, provides a descriptive analysis for Behavioral Intention. It suggests that students while they agree to use computers are not definite in their intention to use computers in the next three months.

Table 7: Descriptive Statistics for Behavioral Intention.

Questionnaire Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	STD
BI1: I intend to use a computer in the next three months	60%	37%	_	2.9%	_	1.45	.66
BI2: I will use a computer in the next three months	29.6%	65.7%	2.9%	2.9%	_	1.8	.63
BI3: I plan to use a computer in the next three months	65.7%	31.4%	_	2.9%	_	1.4	.65

The survey and interviews have given us a better understanding of the factors that influence student attitude in the acceptance and use of computers in most tertiary institutions in emerging economies such as Nigeria. Data from the survey showed the research model was empirically evaluated. All hypotheses were tested and the predicted hypotheses were supported.

DISCUSSION

While students generally have a positive attitude to the use of computers, yet they are not definite in their intention to use computers in the next three months, nor do they strongly agree that they have the ability to use computers. This may be because there are no facilitating conditions that help students learn how to use computers for their school work. There is a lack of commitment by institutional management. From interviews that were conducted, students complained about the lack of adequate and functioning computers and computer text books. They also stated that instructors are not well trained in the use of computer for teaching and

learning. There are no online instructions or exercises for students because instructors do not usually use Course Management software such as Black Board etc. Instructors who lack good computer skills will not strongly influence their students to use computers even if the instructors have strong influence on the students. As revealed in this model, student use of computers is not solely dependent on their ability, but also on facilitating conditions in their environment. Facilitating conditions include good and effective computer training programs for instructors, accessibility to computers and software packages. Teachers should be able to transform their classrooms from sole lecture based format to student-computer interaction centered format. They should not be intimidated by computer technology. Teachers should be made to see the pedagogical importance and gain the use of computers will bring to the classroom and ultimately to the students. Textbooks are not affordable because of costs. Universities should encourage teachers to use digitized text books, and university libraries should stock required computer text books. There should also be adequate functional computers in class rooms, laboratories and libraries.

CONCLUSION

This study adds to the empirical evidence of the factors influencing the use of computers in academic institutions in emerging countries. As revealed in this study, computer use is not only dependent on student positive attitude, ability, and willingness to learn and use computers, but also on instructor preparedness and computer accessibility. The study provides empirical evidence grounded in theory. The findings of the study offer University Stake Holders, University Administrators, College Professors and State Governments valuable insights and a framework that will produce students and faculty that are well skilled in computer use. This study was limited to factors within the academic environment. It did not include having adequate national infrastructure such as adequate power supply, and national telecommunication system.

REFERENCES

Aiken, L. R. (1996). Rating Scales and Checklists: Evaluating Behavior, Personality and Attitudes.*: John Wiley & Sons, Canada.*

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes,* 50(2), 179-211.

Ajzen, I., & Fishbein, M. (1980). Understanding Attitudes and Predicting Social Behavior. *Englewood Cliffs, N. J. Prentice Hall.*

Babbie, E. R (2001). The Practice of Social Research, 9th edition, *Thomson-Wadsworth Publishing Inc. Belmont, CA.*

Badamas, M. (2005). Information Technology for Sustainable Development and Global Competitiveness: Comparing Curriculum in Africa and America. *World Review of Science, Technology and Sustainable Development,* 2(2/3), 261-276.

Bakr, S. M. (2011).   Attitudes of Egyptian Teachers towards Computers Contemporary *Education Technology,* 2(4), 308-318.

Chen, B, & Chang, C. (2006). Using Computers in Early Childhood Classrooms: Teachers' Attitudes, Skills and Practices. *Journal of Early Childhood Research,* 4(2), 169-188.

Compeau, D. R., & Higgins, C. A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly,* 19(2).

Davis F. D., Bagozzi, R. P., & Warshaw, P. R. (1989).   User Acceptance of Computer Technology: A Comparison of two Theoretical Models. *Management Science,* 35(8), 982-1002.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. *Addison-Wesley, Reading, MA.*

Goodhue, D. L. (1995). Understanding User Evaluations of Information Systems. *Management Science,* 41(12), 1872-1844.

Goodhue, D. L., & Thompson, R. L., (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly,* 19(2), 213-236.

Haddad, W., Drexler, A., (2002). Technology for Education: Potentials, Parameters and Prospects. *United Nations Educational and Cultural Organization, Paris, 3-17.* *www.knowledgeEnterprise.org* 1

Kirby, J. R., Maki, S. A., Eguatoff, W., William, R., & Melle, van E. (2002). Computers and Students' Conceptions of Learning: The Transition from Post Secondary Education to the Workplace. *Educational Technology & Society,* 5(2).

Leonard-Barton, D., & Deschamps, I. (1988). Management Influence in the Implementation of New Technology. *Management Science,* 34(10), 1252-1265.

Meister, D. B., & Compeau, D. R., (2000). Infusion and Innovation Adoption: An Individual Perspective. *Paper Presented at the Proceedings of the ASAC.*

Mitra, A., Lenzmeier, S., Steffensmeier, T., Avon, R., Qu, N., & Hazen, M, (2000). Gender and Computer Use in an Academic Institution Report from a Longitudinal Study. *Journal of Education Computing Research*, 23(1), 67-84.

Olaniran, B., Agnello, M. (2008). Globalization, Educational Hegemony and Higher Education. *Multicultural Education and Technology Journal,* 2(2), *68-86.*

Palaigeorgious, G. E., Siozos, P. D., Konstantakis, N. I., & TsouKalas, I. A. (2005). A Computer Attitude Scale for Computer Science Freshmen and its Educational Implications. *Journal of Computer Assisted Learning.* 21, 330-342.

Ramayah, T., Bushra A., & Joshua, I. (2005). PC Usage among Students in a Private Institution of Higher Learning: The Moderating Role of Prior Experience School of Management. *University Saints Malaysia,* 20, 131-152.

Santos, J. R. (1999). Cronbach's Alpha: A Total for Assessing the Reliability of Scales. *Journal of Extension,* 37(2).

Smith, B., Caputi, P., & Rawstone, P. (2000). Differentiating Computer Experience and Attitudes towards Computers: An Empirical investigation. *Computers in Human Behavior,* 16, 59-81.

Tabachnick, B. G., & Fidell, L. S. (2000). Using Multivariate Statistics (4th ed.), *Allyn and Bacon, Needham Heights, MA.*

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science* 46(2), 186-204.

Watkins, K. (2002). Oxfam Education Report*, Oxfam in G.B Publications.*

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