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Full Length Research Paper

Socio-Demographic Characteristics and Perceived Computer Self-Efficacy as Determinants of Attitudes Towards Computer Use Among Secondary School Students

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Technology is challenging the boundaries of the educational structures that have traditionally facilitated learning. Educators who advocate technology integration in the learning process believe it will improve learning and better prepare students to effectively participate in the 21st century workplace. This study investigated socio-demographic characteristics and perceived computer self-efficacy as determinants of attitudes toward computer use among secondary school students. The study employed ex-post facto design. The study was conducted within Ibadan metropolis; using secondary school students as a population. A total number of two hundred and eight (208) secondary students were selected using accidental sampling technique for the study. Four hypotheses were tested in the study using t-test for independent samples, Pearson correlation and one-way Analysis of Variance. The results showed that computer self-efficacy has significant influence on attitudes toward computer use among secondary school students ($t=15.68$; $df=206$; $p<.05$). Gender has no significant influence on attitudes toward computer use among secondary school students ($t=0.76$; $df=206$; $p>.05$). Ages of the secondary school students do not relate with their attitudes toward computer use ($r=-.023$; $p>.05$). Classes of the secondary school students have no significant influence on attitudes toward computer use ($F(2, 205) = 1.11$; $p>.05$). With these findings, it can be concluded that exposing the secondary school students into programmes that could enhance or build their confidence in the use of computer will help them have positive attitudes toward computer use. Socio-demographic characteristics such as gender, age and classes of secondary school students are not vital in ensuring that students have positive attitudes toward computer use.

Keywords: Socio-Demographic, Computer, Technology, Students.

BACKGROUND TO THE STUDY

As the knowledge of computer use has become an increasingly useful tool for everyday life, so has it become a useful tool for psychological research; especially regarding students' attitudes toward computer use. Of course, in this process, secondary school students are not left out. In fact, the population of secondary school students requires proper management in the use of all sorts of computer gadgets. Surprisingly, the use of computer has advantages as well as challenges that must be addressed (Reips, 2000). This can only be better understood if one examines how socio-demographic characteristics and perceived computer self-efficacy influence attitudes toward computer use; using secondary school students as a population.

All schools should be highly computerised, all teachers should be able to use the technology to enhance their working methods and all students should be able to broaden their horizons. These goals should be the priority objectives for any reasonable nation who desires to have bright future generations. Introduction of information Communication Technologies (ICT) into education in Nigeria appear to be a welcome development since its inception. For the first time, ICT was accepted as a subject of education. Only later, it was understudied as an educational tool. The European commission published the plan "Learning in the Information Society" in 1996. The plan included four aims: One benefit is that Internet sampling can provide researchers with the opportunity to obtain a sample more diverse than the traditional college student sample, in terms of both demographics and geography. Turnaround time for survey administration and data collection is faster. The quality of the data is better as people can be reminded to go back to an item that was missed and manual data entry from a paper-based survey is not necessary. Ultimately, the advantages of Internet sampling make it a much more cost-effective procedure (in terms of time and money) than other sampling methods. Moreover, as the technology for using computers and the Internet as a means of data collection becomes easier to use, it becomes even more accessible.

There are also challenges that must be addressed when using the Internet. As mentioned before, an Internet sample is more diverse than a sample of college students, but compared with other sampling techniques, an Internet sample is still limited to those that have access to a computer, those that have access to the Internet, and those that are willing to complete a survey on the Internet. Another challenge is the experimenter's

inability to control the environmental conditions in which Internet participants complete experiments. For example, participants may be completing online surveys or experiments while watching TV, eating, taking care of children or while speaking with others. Such random conditions can lead to inflation of random error variance influencing the validity of statistical conclusions (Cook and Campbell, 1979). Thus, collecting data via the Internet has its own set of challenges that make it different from more traditional methods and samples of data collection.

However, in integrating computers in secondary education, researchers have proposed that positive attitudes toward computers use and high computer self-efficacy and lower computer anxiety levels could be important factors in helping people learn computer skills and use computers (e.g., Busch, 1995). DeLoughry (1993) cited that "as many as one-third of the 14 million college students in the United States suffer from 'technophobia'" and implied that the effectiveness for the use of computers in education might not be realized without research foundations and corresponding planning.

Allport (1935) defined an attitude as a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence on the individual's response to all objects and situations to which it is related. A simpler definition of attitude is a mindset or a tendency to act in a particular way due to both an individual's experience and temperament. Typically, when one refers to a person's attitudes, you are trying to explain his or her behavior. Attitudes are a complex combination of things we tend to call personality, beliefs, values, behaviors, and motivations. As an example, we understand when someone says, "She has a positive attitude toward computer" versus "She has a negative attitude toward computer." When we speak of someone's attitude, we are referring to the person's emotions and behaviors. In this study, the researcher focuses on attitudes toward computer which could encompass their points of view about the use of computer. How the secondary school students feel about the use of computer (e.g., behaviours) is a result of attitude toward computer.

An attitude includes three components: an affect (a feeling), cognition (a thought or belief), and behavior (an action). Attitudes help us define how we see situations, as well as define how we behave toward the situation or object. As illustrated in the tricomponent model, attitudes include feelings, thoughts, and actions. Attitudes may

simply be an enduring evaluation of a person or object. In the context of the present study, a secondary school student may say he or she likes computer or dislikes computer.

Attitudes also provide us with internal cognitions or beliefs and thoughts about people and objects. For example; a secondary school student does not like using computer. Attitudes cause us to behave in a particular way toward an object or person. For instance, a secondary school student may not carry out his or her assignment properly because it upsets him or her when think of how difficult the use of computer is. Although the feeling and belief components of attitudes are internal to a person, we can view a person's attitude from his or her resulting behavior. All these may be said could constitute secondary school students' attitudes toward computer in this present study. Attitude is an individuals' overall affective reaction to using a system. Several studies reveals that individual attitude towards technology have a strong effect on use intention. Woodrow (1991) claimed that students' attitudes toward computers were critical issues in computer courses and computer-based curricula. Monitoring the user's attitudes toward computers should be a continuous process if the computer is to be used as a teaching and learning tool. Other attributes, such as the relationship with gender and age (Morris, 1988-1989), the effects of training and learning (Ford & Noe, 1987), and computer anxiety (Paxton & Turner, 1984) were also related to attitudes toward computers. However, attitudes of secondary school students toward computer may be determined or influenced by their computer self-efficacy. This suggests that computer self-efficacy may influence attitudes toward computer use.

Kinzie, Delcourt, and Powers (1994) defined self-efficacy as an individual's confidence in his or her ability, which may impact the performance of tasks: "Self-efficacy reflects an individual's confidence in his/her ability to perform the behavior required to produce specific outcome and it's thought to directly impact the choice to engage in a task, as well as the effort that will be expended and the persistence that will be exhibited." Self-efficacy has been shown to influence choice of whether to engage in a task, the effort expended in performing it, and the persistence shown in accomplishing it (Bouffard-Bouchard, 1990). The greater people perceived their self-efficacy to be, the more active and longer they persist in their effort (Bandura, 1986). Miura (1987) has suggested that self-efficacy may be an important factor related to the acquisition of computing skills. Computer self-efficacy is a specific type of self-efficacy. Specific self-efficacy is defined as belief in one's

ability to "mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood and Bandura, 1989, p. 408). Thus, computer self-efficacy is a belief of one's capability to use the computer (Compeau and Higgins, 1995) and participants with little confidence in their ability to use computers might perform more poorly on computer-based tasks. On the other hand, previous computer experience may lead students to believe computer applications courses are easy. Heightened self-efficacy may cause students to expend little effort toward learning new computer concepts. On the other hand, Brosnan (1998) argued that better computer self-efficacy could increase persistence in studying computing. In the present study, the researcher examined socio-demographic characteristics and perceived computer self-efficacy as determinants of attitudes toward computer use among secondary school students in Ibadan.

Several attitude change categorization schemes have been proposed in the literature (Eagly and Chaiken, 1993; O'Keefe, 1990), and most are similar. In this study, four attitude theories are discussed to explain variables.

Consistency theories

Learning theories

Social judgment theories

Functional theories

The study of attitudes has been approached with varying emphases and methods during most of this century. Prior to World War II, the emphasis was on definition issues and attitude measurement. Most studies were of a survey nature and provided important correlational findings, but little insight into causality. Experimental techniques such as control groups or comparison groups were notably absent (Himmelfarb and Eagly, 1974). This changed dramatically during World War II. Attitude change was an important topic of Army-sponsored research. Because of the influence of experimental psychologists such as Carl Hovland, true experimental techniques were used to study the persuasive effects of propaganda. The work of Hovland and his associates in the area of attitude change research was continued after the war at Yale University. Theories developed by this group served as an organizational framework for the study of attitude change (Hovland, Janis and Kelley, 1953). Most of Hovland's attitude change research can be considered classical. Most of this research and theory building approached the concept of attitude from the behaviorist perspective, and most research activities dealt with trying to relate attitudes to observable outcomes in learners.

An example of research of the classical type that

demonstrated a consistency theory approach was Simonson's (1977) study of dissonance theory principles. In this study, cognitive dissonance theory (Festinger, 1957) assumptions, one of the most influential consistency theories, were used in a formal program of attitude change in order to improve student attitude toward an instructional activity. Student achievement in this instructional activity was then measured to determine if achievement was influenced by a change in student attitude toward instruction. Randomly assigned to one of three treatment groups were 218 students. Students in the experimental treatments were asked to make a videotape about their attitudes toward an instructional activity. An "Instructional Improvement Needs Assessment" was the title given to the fictitious activity that in reality was the research study. First, students were given a camouflaged attitude pretest. Then, students were met individually by a researcher who told them that:

I am a member of a committee in the college called the Instructional Improvement Needs Assessment Committee. We are attempting to obtain as much information as possible about student's opinions of college courses. This is difficult, so we are asking for several different types of information. Then, depending on the random treatment group assignment, the students were told:

Control group: "I would like you to complete this Needs Assessment opinionnaire. You can fill it out in the next room. Answer on the score sheet and when you finish place the opinionnaire and answer sheet in the box."

Nonrelevant treatment group: "The entire committee would like to study your opinions, so I will give you several minutes to think of everything positive you can about (a course irrelevant to the study and to the attitude tests). Then I will take you to the next room where we will ask you to state your positive comments while you are being videotaped. We need to videotape you so that the entire committee can get together and observe all the videotapes. I'll give you 5 minutes to collect your thoughts."

Relevant experimental group: The experimenter read the same comments to students assigned to this group, with one exception; they were given the name of the course that the study was attempting to change attitudes about.

Students in the "irrelevant" and "relevant" groups were given time to jot down ideas and then were escorted into the video-recording room where their comments were recorded. When they were finished, they were told that "faculty and students will be viewing this tape." Next, they signed a release and were given a questionnaire that contained the attitude test embedded among other items.

Subjects in the "relevant experimental treatment" who initially had low attitudes toward the course in question were expected to experience dissonance when they stated positive comments about this course. The dissonance-producing experience was heightened by leading the students to believe that a group of peers and faculty would view the videotapes. The videotaping session and the signing of the release were included to make the treatment procedures as forceful and irreversible as possible. The two other treatments were included to control for the impact of videotaping and for change due to extraneous events.

Results of this classical dissonance theory study demonstrated that attitude change could be produced. Students in the relevant videotaping group changed their attitudes toward the course they were asked to talk about more than one standard deviation ($p < .0001$). Simonson (1977) also tested the persistence of the attitude changes and reported that while there was a regression to the mean, student's attitudes remained positive 6 weeks later. There was only a minor and statistically insignificant relationship between attitude change and achievement.

This study showed in an experimental situation with real-world implications, that it was possible, even simple, to modify student attitudes toward an instructional event, in this case a college course. Simonson used video recording as a technique to "cement" and make irreversible a student's attitude positions. No one would argue that the video recording itself changed attitudes. The forces that changed attitudes were the arguments created by the student that were recorded on the video. In this situation, the video recording was a methodological tool of the researcher.

Design

The researcher used ex post-facto research design in the study. The design was chosen because it was survey in nature, and there was no manipulation of variables in the study. Rather than manipulating the variables in the study, the researcher measured them as they occurred because the influence of the independent variables on the dependent variable has already taken place. The independent variable in this study is computer self-efficacy. The dependent variable is attitude toward computer use.

Participants

This study was conducted within Ibadan metropolis Ibadan Local Government area; using secondary school students of Oba Akinbiyi School I and II as a population.

A total number of two hundred and eight (208) secondary students were selected using accidental sampling technique for the study. The accidental sampling technique was used whereby the participants were not subjected to any form of random selection; rather they were approached in their classes with the intervention of their class teachers to participate in the study.

The participants included 79(38%) males and 129(62%) female secondary school students. The students' ages ranged from 12 to 24 years with mean age of 16.31 years and standard deviation of 2.21 years. One hundred and nine (52.4%) of the participants were in SSSII class, 41(19.7%) were in SSSI class and 58(27.9%) were in SSSIII class. The participants' duration of computer use ranged from 1 to 6 years with mean year of 2.69 and standard deviation of 0.98.

Instrument

Questionnaire was used as an instrument for data collection data in this study. The questionnaire consists of three sections, A, B and C which measure demographic variables, attitudes toward computer use and computer use self-efficacy as follows:

Demographic Variables

Section A consists of students' sex (male and female), class (SSSI, II and III) and duration of the use of computer in year.

Attitudes toward Computer Use Scale

Section B consists of a 20-item Attitudes toward Computer Use scale developed and validated by Nickell and Pinto (1986). The attitudes toward computer use scale is a 20-item self-report inventory, rated on a five point Likert type scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree). Total scores on the scale ranged from 20, indicating an extremely negative attitude toward the computer use, to a score of 100, which would imply an extremely positive attitude toward the computer use. The authors of the original scale reported internal reliability consistency of 0.72. In the present study, alpha coefficient of 0.73 was reported for the 20-item Attitudes toward Computer use scale.

Computer Use Self-Efficacy Scale

Section C consists of a 29-item Computer Self-Efficacy scale (CSE) (Torkzadeh and Koufteros, 1994; Murphy,

Coover, and Owen, 1989). CSE has 29 items, each item preceded by the phrase "I feel confident". The participants responded to a five-point Likert type scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree). Total scores for CSE ranged from 29 to 145, with high scores indicating a high degree of confidence in a participants' ability to use computers (Durndell, Haag, & Laithwaite, 2000). The authors reported reliability of 0.90. In the present study, the researcher reported reliability coefficient alpha of 0.81

Procedure

As an ethic of carrying out a research, the consent of the respondents was sought for in order to have their true response. The researcher sought the consents of principals of the secondary schools selected to use their students as participants for the study. The objectives of the study were made known to the principals. Participation in the study was made voluntary. The participants were assured that their responses to the questionnaires would be held in strict confidence and that they would be used only for academic purposes. Two hundred and fifty (250) questionnaires were accidentally distributed to the participants, out of which two hundred and eighteen (218) were retrieved. After sorting out those questionnaires that were not properly filled, a total of two hundred and eight (208) were eventually used for data analysis in this study.

STATISTICAL METHOD

The data collected were subjected to analysis using Statistical Packages for Social Sciences (SPSS) software packages. Demographic variables were analysed using descriptive statistics such as percentage, mean and frequency distribution. The four hypotheses stated were tested using inferential statistics. Hypotheses one and two were tested with the use of independent samples t-test in order to determine significant differences in attitudes towards computer use based on the participants' levels of computer self-efficacy.

RESULTS

Hypothesis one was stated that students who are high in computer self-efficacy would have positive attitudes towards computer use than those who are low in computer self-efficacy. The hypothesis was tested using t-test for independent samples. The result of t-test

Table 1 Summary Table of t-test Showing Influence of Computer Self-Efficacy on Attitudes toward Computer Use among Secondary School Students

	Computer Self-Efficacy	N	\bar{X}	SD	Df	t	P
Attitudes to Computer Use	High	102	74.66	7.49	206	15.68	<.05
	Low	106	60.33	5.89			

Table 2 Summary Table of t-test Showing influence of Gender on Attitudes toward Computer Use among Secondary School Students.

	Gender	N	\bar{X}	SD	df	t	P
Attitudes to Computer Use	Male	79	68.01	10.02	206	0.76	>.05
	Female	129	66.95	9.57			

Table 3 Summary Table of One-way ANOVA showing influence of Class on Attitudes toward Computer among secondary school students

Source	Sum of Square	df	Mean Square	F	P
Between Groups	210.56	2	105.28	1.11	>.05
Within Groups	19403.12	205	94.65		
Total	19613.68	207			

presented in Table 1 shows that computer self-efficacy has significant influence on attitudes toward computer use among secondary school students ($t=15.68$; $df=206$; $p<.05$). The result shows that secondary school students who score high in computer self-efficacy ($=74.66$) have positive attitudes toward computer use than those who are in low in computer self-efficacy ($=60.33$). Therefore, hypothesis one was confirmed in this study.

Hypothesis two stated that male secondary school students would have positive attitudes toward computer use than female secondary school students. The hypothesis was tested using independent samples t-test. This result is presented in Table 2.

The result of t-test analysis presented in Table 2 shows that gender has no significant influence on attitudes toward computer use among secondary school students ($t=0.76$; $df=206$; $p>.05$). This result shows that male secondary school students ($=68.01$) are not significantly different in attitudes toward computer use compared to female secondary school students ($=66.95$). Therefore, hypothesis two was not confirmed in this study.

Hypothesis three stated that ages of secondary school students would have positive relationship with their attitudes toward computer use. The hypothesis was tested using Pearson Correlation. This result is presented in Table 3.

DISCUSSION

Findings showed that secondary school students who were high in computer self-efficacy have positive attitudes toward computer use than those who were low in computer self-efficacy. In support of the present finding, studies show that individuals who have higher computer self-efficacy are more ambitious to attend to the activities of computer and they have higher expectations from those kinds of studies (Aşkar and Umay 2001); which relatively dispose them to have positive attitudes toward computer use. In addition, these individuals cope with a problem about computer more easily (Karsten and Roth 1998; Compeau and Higgins 1995). Aşkar and Umay (2001) indicated that inexperience and less computer usage cause students to have low computer self efficacy. According to them, inexperience and less computer usage cause students to have low computer self efficacy and low computer self efficacy affects in experience and less computer usage in much more negative way. Researchers indicated that students should be encouraged to use computer. Akkoyunlu and Orhan (2003) emphasized positive experiences affect computer self-efficacy believes of individuals in a positive way and negative experiences affect computer self-efficacy believes of individuals in a negative way. Also,

suggesting that secondary school students with high level of computer self-efficacy are more likely to have positive attitudes toward computer use.

Hypothesis two was stated that male secondary school students would have positive attitudes toward computer use than female secondary school students. The hypothesis was tested using t-test for independent samples and this was not confirmed in the study. The finding showed that male secondary school students were not significantly different in attitudes toward computer use from female secondary school students. This study challenges the long perceived male bias in the computer environment (Chen, 1986; Balka and Smith, 2000; Durndell and Thompson, 1997; McIlroy et al., 2001; Torkzadeh and Koufteros, 1994; Whitely, 1997) and instead supports recent studies that have identified greater gender equivalence in interest, opportunity, use, and skills levels (Green, 1998; Shaw and Giacquinta, 2000). Gender, at least among the secondary school students in this study, did not account for differences attitudes toward computer use. Female as well as male secondary school students seem to be equal in their receptivity to the use of the computer, the extent of their computer use, and the purposes for which they use the computer.

Hypothesis three was stated that secondary school students who were in SSSIII would have positive attitudes toward computer use than those who are in SSSI and SSSII. The hypothesis was tested with One-way ANOVA and was not confirmed in the study. The finding showed that classes of the secondary school students did not influence their attitudes towards computer use. This finding indicates that all students are taught the basic skills required to use computer; and therefore expected to have positive attitudes toward computer use. This finding seems not to support the assertion that there were differences in students' attitudes toward computer use based on the level of class (Shaw and Giacquinta, 2000). Students from levels that the use of computer was mandatory were found to have positive attitudes toward computer use than students from other classes. Shaw and Giacquinta (2000) discovered that educational technology students reported using computers more frequently, for a wider array of purposes, and for greater number of hours each week than students in the Educational Administration, Business Education, and Higher Education programs.

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