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Computer Attitude of Engineering Students of Pangasinan State University

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Abstract: **Determining the students' tripartite frame of attitude towards computer in terms of affective component, behavioral component, and cognitive component is important now that information and computer technology is now widely used in education. Discovering if there is a significant difference in the students' tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer is also significant. To achieve the goal, 82 engineering students from randomly selected two heterogeneous intact sections were asked to fill up the Computer Attitude Questionnaire adapted from Computer Attitude Questionnaire developed by Smalley, Graff and Saunders. To determine if there is a significant difference in the students' tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer, one-way MANOVA was used. Results shows that students have a slightly negative feeling towards computers but have positive behavior when doing computer activities and have positive beliefs and thought about computers. Also, there is no significant difference between the tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer.**

Keywords: **computer attitude, computer, education, attitude, engineering, affective, behavioral, cognitive, tripartite.**

1. INTRODUCTION

Computer attitude scales began to proliferate in the early 1980s following the launch of the first personal computer in 1978[1]. In the workplace, many individuals were fearful of the new technology since they anticipated that computers would eventually replace humans and the jobs they carried out. The concept of technophobia emerged and with it, the need to assess and measure people's attitudes toward computers in order to gauge the extent of the problems and to find solutions. Increasing use of computers in an educational setting also drove the research agenda. Many studies evaluated teacher and student attitudes toward the 'new technology' so the learner's experience could be enhanced and improved.

Understanding why people accept or reject information technology has proven to be one of the most important and challenging issues in information system research. In general, no matter how sophisticated and how capable the technology, its effective implementation depends upon users having positive attitude towards it. Discovering the computer attitude of the students is important especially when the teacher is planning to integrate computer technology in instruction[2].

Students are now expected to use ICT efficiently within their learning. It has therefore become important to learn how students perceive ICT and in what variables does computer attitudes vary. Thus, this study aims to determine the engineering students' tripartite frame of attitude towards computer attitude in terms of a) Affective Component, b) behavioral component, and c) cognitive component? This study also aims to determine if there is a significant difference in the students' tripartite frame of attitude towards computers when grouped according to a) gender, b) availability of computer at home, and c)Number of hours spent per day in using the computer.

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Attitudes and the ABC Model:

Attitudes can be defined as evaluations of ideas, events, objects, or people. Attitudes are generally positive or negative, but they can also be uncertain at times[3]. Every attitude has three components that are represented in what is called the ABC model of attitudes: A for affective, B for behavioral and C for cognitive[4].

The cognitive component of attitudes refers to an individual's beliefs, ideas, and thoughts toward people or objects as either good or bad in quality. A person's cognitive evaluation forms his or her emotional attachment to that object. Those emotions or feelings (e.g., like or dislike, favorable or unfavorable, satisfied or unsatisfied) are grouped into the affective component of attitudes. The affective component refers to the emotional reaction one has toward an attitude object. an attitude that is stemmed from or originally created by an emotion is called an affectively-based attitude. Attitudes about hot-button issues - such as politics, sex, and religion - tend to be affectively-based, as they usually come from a person's values. This type of attitude is used to express and validate our moral belief or value systems. When a person forms beliefs and feelings toward an object, he or she will have a psychological orientation or an expectation (a tendency) to react to that object in a particular way, in terms of readiness to approach or to avoid (or to harm or destroy) the object. These predispositions comprise the behavioral tendency component of attitudes[5].

Computer Attitude Scale :

Bandura's concept of self-efficacy gained popularity with many computer researchers who began developing scales for measuring computer self-efficacy[6] as well as related concepts such as computer confidence or computer competence[7]. But there is no generally accepted definition of what an attitude towards computers is[8]. Some researchers defined the attitude towards computers as a general positive or negative evaluation of an individual's feelings towards computer technology and the specific activities related to the use of computers[9]. According to Kay[10], there may be fourteen different definitions of computer-related attitudes, which range from the simple "I like/dislike computers" statements to the complex feelings of anxiety or worry which can be aroused by the use of computers.

2. METHOD

The subjects of the study are 82 engineering students of Pangasinan State University enrolled in the second semester of academic year 2014-2015. Randomly selected two heterogeneous intact sections of second Engineering students were asked to fill up the Computer Attitude Questionnaire adapted from Computer Attitude Questionnaire developed by Smalley, Graff and Saunders. To determine if there is a significant difference in the students' tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer, the one-way multivariate analysis of variance (one-way MANOVA). One way MANOVA is used to determine whether there are any differences between independent groups on more than one continuous dependent variable. In this regard, it differs from a one-way ANOVA, which only measures one dependent variable. In this study, dependent variables are gender, availability of computer at home, and number of hours spent per day in using the computer and the independent variables are the affective component, behavioral component, and cognitive component of computer attitude of students.

3. RESULT

Profile of the Respondents:

Table I present the distribution of students according to gender. It is expected that there are more male students than female students because Engineers are predominantly males. The nature of the work of civil engineers makes it hard for women to perform field works thus more males are taking engineering courses.

TABLE I: DISTRIBUTION OF STUDENTS ACCORDING TO GENDER

Gender	N	Percentage
Male	55	67
Female	27	33

Table II presents the distribution of students according to availability of computer at home. Almost one-third of the students do not have computers at home. Most of them do their computer related school requirements by borrowing laptops from their classmates or renting computers at computer shops.

TABLE II: DISTRIBUTION OF STUDENTS ACCORDING TO AVAILABILITY OF COMPUTER AT HOME

Availability of Computer at home	N	Percentage
No computer at home	29	35
With computer at home	53	65

Table III presents the distribution of students' number of hours used per day in using the computer. Majority of the students spends 3-4 hours using the computer. Most of their activities are browsing the internet for doing assignments, downloading of pictures and movies, social media and communication purposes. It is noteworthy to mention that nine percent of the respondents do not use computers every day. These students do not have computers at home at uses computers only in making school requirements for encoding and printing. The 10% of the students who uses the computers for more than 6 hours a day are mostly students with computers at home, laptop and tablets and has internet connections.

TABLE III: DISTRIBUTION OF STUDENTS' NUMBER OF HOURS USED PER DAY IN USING COMPUTER

	N	Percentage
0 hours per day	7	9
1-2 hours per day	2	2
3-4 hours per day	48	58
5-6 hours	17	21
More than 6 hours per day	8	10

Computer Attitudes of the Respondents:

The students have a slightly negative feeling about computers. There is a slight feeling of fear or anxiety when exposed to computers. This may due to their poor exposure to computers during their high school days. Normally, in high schools in the rural areas, only the students who belong to higher sections are taught computer skills. The lack of computer facilities in the provinces forces the school heads to put students in lower sections to agriculture or vocational areas.

While students have a slight negative feelings about computers, survey results indicates that students have a positive behavior when exposed to computers. Although they feel fear and anxiety towards computers, students will not avoid computer related activities. Students have also a slightly positive thought and beliefs on computers, on what computers can do as indicated in the mean of their responses. They know that computer is a great help in doing and finishing their school requirements.

TABLE IV: COMPUTER ATTITUDE OF RESPONDENTS

	Mean
Affective Component	2.29
Behavioral Component	3.64
Cognitive Component	3.46

Differences in Computer Attitude:

Result of the one-way MANOVA revealed that there is no significant multivariate main effect for gender, Wilks' λ = 0.905, F (3, 78) = 2.727, p >0.05, partial eta squared = 0.095. Power to detect the effect was 0.641.

Result of the one-way MANOVA also show that there is no significant multivariate main effect for the variable that represents the existence of computer at home, Wilks' λ = 0.981, F (3, 78) = 0.498, p > 0.05, partial eta squared = 0.019. Power to detect the effect was 0.147.

For the last variable which is the time spent in using the computer, one-way MANOVA result shows that there is no significant multivariate main effect for the variable, Wilks' λ = 0.859, F (12, 198.723) = 0.977, p >0.05, partial eta squared = 0.049. Power to detect the effect was 0.494.

Results of running MANOVA is SPSS indicates that there is no significant difference between the tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer. Therefore, there is no evidence to say that male and female engineering students differ in their computer attitude. There is also no evidence that the emotion, behavior and beliefs of students with computer at home differs from those without computer at home. Lastly, computer attitude is not dependent on the students' length of use of computers.

TABLE V: WILKS' LAMBDA SIGNIFICANCE VALUE FOR DEPENDENT VARIABLES

Independent Variable	Wilks' λ	F	*p*	Partial Eta Squared	Power to detect the effect
Gender	0.905	F(3,78) = 2.727	0.055	0.095	0.641
Existence of Computer at Home	0.981	F(3,78) = 0.498	0.685	0.019	0.147
Number of hours per day in using the computer	0.859	F(12,198.723) = 0.977	0.472	0.049	0.494

4. CONCLUSION

From the result of the analysis of the data gathered, it is evident that engineering students of Pangasinan State University have a slightly negative feeling towards computers but they have positive behavior when doing computer activities. Students have also positive beliefs and thought about computers. Also, there is no significant difference between the tripartite frame of attitude towards computers when grouped according to gender, availability of computer at home, and number of hours spent per day in using the computer. Hence, instructors integrating computer technology in their instruction can treat the students equally in using and implementing computer based instruction.

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