

## WHAT PREDICTS ATTITUDES TOWARD COMPUTER?

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**Abstract:** The study was conducted to examine the status of computer use and attitudes among secondary school students. It also identifies the relationships among the variables and the predictors of computer attitudes. External variables (such as computer experience and frequency of use), perceived usefulness and confidence are included as potential antecedents of attitudes toward computer. Data was collected among 293 secondary school students in Kedah, Malaysia. It was found that there exist moderate to strong relationships between all the variables studied, with r-value ranging from .17 to .69. Regression analyses have identified confidence in using computers as the strongest predictors of computer attitudes, with  $R^2 = .48$ . Other variables, computer experience, perceived usefulness and frequency of use also entered the equation, but turned out to be poor predictor of attitude toward computers. Discussion of findings and suggestions for future research are included in the text.

### INTRODUCTION

In the quest of preparing Malaysians toward becoming information and technologically developed citizens by the year 2020, the Malaysian Government has recognized that the ability of students to continually master new technologies will have a critical impact on the country's future global competitiveness. Thus, it has included Information Technology (IT) education in its national agenda through such initiatives as the smart schools program under the Multimedia Super Corridor (MSC) project, ICT in-Contact and Zoom A. These projects require students to utilize computer technologies to enhance their knowledge of the related subject. To ensure that computers are successfully integrated in teaching and learning and eventually, improve the students' learning process requires commitment from both students and teachers. Students, for example need to be prepared with strong basics in computer use. This is proven true when Hong, Ridzuan and Kuek (2003) found that students with better basic skills in computer have positive attitudes toward the use of computer for learning purposes.

Mastering computer technology and harnessing it for widespread and comprehensive use among the students is not an easy task. This becomes even more challenging when this technology is progressing and changing rapidly. Students need to have the right kind of attitudes to be able to keep up-

to-date with the rapid changes that occur in computer technologies. According to Divine and Wilson (1997), developing positive attitudes among the students is more critical than merely increasing students' computer skills because "positive attitudes will automatically lead to the learning of computer skills". Students' attitudes toward computers must be clearly identified so that recommendations can be made to the relevant parties, such as, teachers, school administrators, administrators at the educational department level and also curriculum planning groups. The information will allow them to gain insights on best approaches to integrate computer technologies for teaching and learning.

This study is mainly motivated by the fact that attitudes of school students toward computers is still not widely explored in the context of Malaysian schools, even though quite a number of schools are already using computers regularly. To prepare students' mental framework for future learning of computer skills, we need to know the conditions and factors that affect the formation of their attitudes toward computers. It is especially interesting to know what these young people really think of, expect from, fear and know about these new technologies.

## **RESEARCH OBJECTIVES**

1. To examine the levels of experience, frequency of use, confidence, perceived usefulness and attitudes of computers among the students.
2. To examine the relationships between the variables studied.
3. To identify the predictor(s) of attitudes toward computers.

## **REVIEW OF THE LITERATURE**

### **Attitudes toward computers, confidence and perceived usefulness**

If students are to adopt computer technologies, they must have the right kind of attitudes toward computers. Researchers have investigated the relationship between computer attitudes and computer adoption or uptake. The importance of attitudes and beliefs for learning to use new technologies is widely acknowledged (DeYoung and Spence, 2004; Loyd and Gressard, 1984; Ray, Sormunen, and Harris, 1999; Saade and Galloway, 2005).

Regarding the meaning of attitudes, different researchers gave different but somehow related definitions of the word. Aiken (1980) described attitudes as "learned predispositions to respond positively or negatively to certain objects, situations, concepts, or persons". Some other researchers used psychological constructs to explain attitudes. Loyd and Gressard (1984), for example, divided the construct 'attitudes' into four different variables, which are: 1) computer

liking; 2) computer anxiety; 3) computer confidence, and: 4) perceived usefulness of the computer.

There are researchers who seemed to be satisfied with Loyd and Gressard's definition, like Koohang (1989) and Necessary and Parish (1996). The multidimensionality concept of attitudes towards computers is also supported by Wang, Chen and Shi (2007) when they proposed three dimensions to represent this construct. However, simple uni-dimensional perspective of the attitude toward computer is also widely applied by many researchers, for example Divine and Wilson (1997) who are contented with the dimension computer liking, and Mitra (1998) who prefers computer anxiety as the sole dimension to represent attitude toward computers.

For this particular study, authors refer to attitude as a uni-dimensional construct which refers to comfort (or negatively worded as anxiety) in using computers (Mitra, 1998). Computer anxiety can influence the attitude of users towards using computer (Igbaria & Chakrabarti, 1990). This is also supported by other previous studies (Mahar, Henderson, & Deane, 1997; Todman & Monaghan, 1994; Ventakesh 2000). Computer anxiety can be defined as fear of computers. Other term that has been used to explain similar attitude is computer avoidance (Bohlin, 2002). By identifying the predictors of computer anxiety, use of computers among students can be better explained.

If students perceived the usefulness of computer and feel confident in using it, this will lead to more positive attitudes, thus tend to use computer more (Noiwan, Piyawat, & Norcio, 2005). Similarly, Garland and Noyes (2005) also found that confidence correlate positively towards computer attitude, whereas Gao (2005) found that perceived usefulness is positively correlated with computer attitude.

Therefore in this study, it is hypothesized that perceived usefulness and confidence are possible antecedents of attitude (comfort/anxiety).

### **Experience and frequency of use**

Many studies on computer attitudes used computer experience and frequency of computer use as related variables. Empirical evidence derived from studies by McGrath and Thurston (1992), Hunt and Bohlin (1993), McLnerney, McLnerney and Sinclair (1990) and Yaghi (1997), revealed that there is a significant difference in attitude among students with different level of computer experience, favoring the group with higher level of experience in computing. Similar results were also indicated in a study by Divine and Wilson (1997). In this study, the researchers compared the attitudes between the senior and junior students and found that the seniors, whom have had more experience in computing, showed more positive attitudes toward computers, especially in terms of confidence and non-anxiety. Further support of the findings was also

reported in recent studies (see Garland & Noyes, 2004; Havelka, 2004; Mitra & Steffensmeier, 2000; Teo, 2006).

Besides computer experience, researchers also found that greater frequency of computer use leads to positive attitude (Garlaand & Noyes, 2004; Shashaani, 1997; Teo, 2006).

## **METHODOLOGY**

A total number of 293 secondary school students at the age of 16-17, participated in this study. The information used for this study was gathered through a questionnaire, which comprises of three different sections: (i) Background Information (including experience in using computer and frequency of use); (ii) Perceived usefulness; (iii) Confidence, and (iv) Attitudes toward computers.

Respondents' background information items were designed mainly to build the profile of respondents, and also to collect information on frequency of use and experience of students in computer use. The latter two variables are measured by an item each.

Perceived usefulness of computers and confidence in using computers are assessed via the likert-type instrument, which is adopted from the Computer Attitude Scale (CAS) by Loyd and Gressard (1984). The two variables consist of 10 items each. Sample statements are "Learning to use computers is worthwhile" and "I feel confident to use computers", for perceived usefulness and confidence respectively. Respondents were required to check one of the five descriptors ranging from "Strongly disagree" to "Strongly agree".

Finally, the variable attitude toward computers is measured by means of 10 likert-type scaled items, following that of computer comfort/anxiety dimension by Loyd and Gressard (1984). Sample items include "I feel comfortable when using computers" and "Working with computers makes me nervous" (negatively worded). For this section, respondents were asked to rate their attitudes based on five descriptors ranging from "Strongly disagree" to "Strongly agree".

## **FINDINGS**

### **RQ#1: What are the levels of experience, frequency of use, confidence, perceived usefulness and attitudes of computers among the students?**

The result showed that students experience in using computers was moderate. With mean value of 2.1, they had an average of slightly above two years of experience in using computers. For frequency of use, the result showed that the majority of students (27.6%) used computers on a weekly basis. (Add on ownership). The means of other variables, which are based on a five-point

likert-type scale, are shown in Table 1. The value of Cronbach Alpha for internal consistency is also illustrated in this table.

**Table 1: Descriptive statistics of the variables**

	N	Alpha	mean	mode	s.d
1. experience in using computer	293	-	2.1	1-2 years (46.8%)	1.48
2. frequency of use	291	-	3.92	Weekly (27.6%)	0.45
3. confidence	293	0.64	2.34	-	0.90
4. perceived usefulness	293	0.71	3.73	-	0.59
5. attitudes	293	0.73	2.75	-	1.36

**RQ#2: What are the relationships between the variables in the study?**

**Table 2: Correlations between variables**

	1	2	3	4	5
1. experience in using computer	1.00	** .37	** .28	** .17	** .38
2. frequency of use		1.00	** .34	** .28	** .50
3. confidence			1.00	** .58	** .69
4. perceived usefulness				1.00	** .55
5. attitudes					1.00

\*\*p<0.01

Table 2 shows the correlations between the five variables observed in this study. Pearson product moment analysis indicated significant correlations between the variables, ranging from  $r=.17$  for the weakest correlation, between perceived usefulness and frequency of use, and  $r=.69$  for the strongest correlation, between confidence and attitude, at  $p<0.01$ .

**RQ#3: Which are the predictors of computer attitudes?**

Stepwise regression analysis was conducted to determine the strongest predictor of attitudes toward computer, and the result is as shown in the Table 3.

**Table 3: Summary of the Result of Regression Analysis to Predict Computer Attitudes**

Step	Variable Entered	R <sup>2</sup>	R <sup>2</sup> Change	F Change	df	p
1	Confidence	.48	.48	263.9	289	.000
2	Computer Experience	.55	.07	51.2	288	.000
3	Perceived Usefulness	.58	.03	16.4	287	.000
4	Frequency of use	.59	.01	9.9	286	.002

The variables that entered the regression equation were perceived usefulness, computer experience, frequency of use and confidence. Among the four variables tested, confidence in using computer was found to be the strongest predictor of attitude four variables, with  $R^2 = .48$ , whereas the other three

variables account for the remaining 11% of the variance that explain computer attitude.

## **DISCUSSIONS**

The study was conducted among students of Form Four (average 16 years old), in a rural area in the northern part of Malaysia. Based on the findings, students indicated that they have an average of two years of experience in using computers. Considering their location and lack of access to computers, the two-year experience albeit brief is a positive start to familiarizing students with computer technologies. However, the literature indicates that children can benefit from the exposure to computers beginning from the age of three (Subrahmanyam et al. 2000). Hence, the experience gained by these students may not be sufficient to be considered as true experience in computer use.

Students' low frequency of use (weekly basis) can be explained by the fact that these students have little access to computers both at school and at home. Only 33.1% of the respondents indicated that they own a computer at home. Coupled with low access at school, whereby computer classes are conducted on a weekly basis, students fail to obtain enough exposure to computers. In comparison, in the United States kids and teenagers ages 3-17 use computers approximately 1 hour 37 minutes per day (Subrahmanyam et al. 2000).

As far as the other variables are concerned, the results indicated that students had moderate level of confidence and attitude, but high level of perception toward computer usefulness. This indicated that the students have positive awareness of the importance of computer in doing their current work and also for their future advancement.

The strongest correlation exhibited in this study was between confidence and attitude, thus, supporting results by Garland and Noyes (2005). Besides that, experience in using computer and perceived usefulness also showed strong correlations with attitude, parallel to previous studies by Garland and Noyes (2004), Gao (2005), Havelka (2004), Hunt and Bohlin (1993), McGrath and Thurston (1992), McInerney, McInerney and Sinclair (1990), Mitra and Steffensmeier (2000), Teo (2006) and Yaghi (1997). This means that, students who are confident in using computers are more likely to have positive attitude toward computers, in that they don't feel anxious to use the technology. In addition, student attitude toward computers is also linked with how useful they think the computer is and the amount of experience they have in using computers.

On the other hand, the weakest correlation was between perceived usefulness and frequency of use. This is in contrast with Noiwan, Piyawat and Norcio's

(2005) findings. In other words, how students perceived computer as useful is not so much associated with how frequent they use the computers.

For the prediction of attitudes toward computers, the results showed that all variables tested, experience in using computers, frequency of computer use, perceived usefulness and confidence, entered the model. The variable confidence was the strongest predictor to explain student attitudes toward computers,  $R^2 = .48$  or 48% of the variance. The other variables only explain the remaining percentage (11%) of the variance. Parallel to findings of previous studies (Garland & Noyes, 2005; Noiwan et al., 2005), confidence in using computer was identified as an important factor of student attitudes toward computers. This study also supports previous findings in that, other factors such as experience in using computers (Divine and Wilson, 1997; Havelka, 2004; Hunt & Bohlin, 1993; Teo, 2006), perceived usefulness of computers (Gao, 2005; Noiwan et al., 2005) and frequency of use (Garland & Noyes, 2005; Link & Marz, 2006) also play roles in predicting computer attitudes. In addition, Yaghi (1997) has also pointed out that users who are more confident, more experienced and perceive computers as useful are actually more positive toward computers. It is also important to highlight here that the findings of this study also support Garland and Noyes' (2004) results in terms of computer experience, as a significant, but poor predictor of attitude.

## **RECOMMENDATIONS**

Based on the findings of this research, the following are some recommendations for preparing students for computer technologies.

Since students portray positive attitudes toward computers, efforts in creating or instilling the right kind of attitudes toward computers among students simply means reinforcing existing positive attitudes. However, the complex nature of attitudes may require certain kind of attitude assessment to be conducted prior to computer instruction so as to determine the factors needed for improvement. This study highlights the importance of uplifting students' confidence level in using computers. If students are confident in using the technology, it is predicted that their attitudes toward computer will also rise.

The study also identified that students' levels of computer experience and frequency of use are moderate. Since these two factors are also predictors of computer attitudes, measures should be taken to ensure that students are given more exposure to hands-on experience. Since not everyone can afford to have computers at home, schools should provide more opportunities for students to use computers as frequently as possible.

In terms of research, this study has its own limitations. The use of only four students located in a rural area is certainly one of them. Findings of this study therefore can only be generalized for a similar group of students. Further

studies can utilize different age groups of students so as to provide a broader picture of the status of computer attitudes and skills among the students in Malaysia. Using different age groups, researchers can also examine the possibility of differences that may occur between the junior students and the senior ones. It would also be worthwhile to include subjects from urban schools as well, and compare whether there are significant differences in the attitudes of students who come from the rural and urban areas. Perhaps the data obtained may show at least differences in terms of their experience and frequency of use.

It is also recommended that in addition to the survey method, researchers can shed light on the complex nature of attitudes, by interviewing the subjects. Reasons behind certain kind of attitudes can also be explained by open-ended type of questions, instead of the Likert-type items commonly used to measure attitudes and skills. Another type of research method that may appeal to certain researchers is the longitudinal or experimental study. Using this type of study, researchers can actually test whether the findings on the strongest predictor of attitudes, which is perceived usefulness, can really bring about changes in students' attitudes.

## **CONCLUSION**

As a final note, studying attitudes toward computer among students are critical for the successful implementation of computer and information technology in the classroom. Findings of such studies will determine the proper direction toward the success of technology incorporation in the classroom. Additionally the instilling of positive attitude toward computers will assist the nation to achieve its goal of an information literate society who is able to keep abreast with the latest technology development.



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