

## Exploring the relationship between learning strategies and computer attitudes among Malaysian secondary school students

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**Abstract.** The introduction of a discrete Information and Communication Technology course for secondary school students in Malaysia is the right step forward to produce successful 21<sup>st</sup> century learners. Consequently, the curriculum not only ensures students become proficient in the ICT subject matter, it also ensures that students develop positive attitudes toward ICT—in particular computer technology. This study sought to explore the relationship between learning strategies and computer attitudes. Learning strategies are widely believed to be related to positive computer attitudes. Data were collected from 155 secondary school students through questionnaires. The results showed a positive correlation between computer attitudes and five types of learning strategies— motivation, time management, information processing, selecting main ideas and test strategy. The present study suggests that learning strategies is associated with positive computer attitudes among students.

**Keywords:** learning strategies, computer attitudes, students.

### 1. Introduction

Information Technology and Communication (ICT) has become more ubiquitous in classrooms around the world. Indeed, ICT has been recognized as a tool to boost the teaching-learning process [1,2,3,4]. More specifically, computers are seen as an emerging and dynamic tool that can and will bring about significant transformation to the learning environments. The learning environments are being transformed where educators and students are expected to teach and learn using ICT [5,6]. The Malaysian Ministry of Education (MMOE) introduced a discrete Information and Communication Technology course for secondary school students in 2001 to ensure that they acquire necessary ICT knowledge and skills to be successful 21<sup>st</sup> century learners [7]. The introduction of the ICT subject in Malaysian secondary schools is aimed at producing creative thinkers with some basic ICT literacy [7]. It is hoped that this move will help boost the ICT literate work force's ability to compete in the ever-changing global economy in the 21<sup>st</sup> century [8]. The main aim of the discrete ICT curriculum is to provide students with adequate ICT knowledge and skills who will then become dynamic and progressive individuals who appreciate technology advancement based on their positive attitudes and noble values and ethics [8].

Consequently, the curriculum not only ensures students become proficient in the ICT subject matter, it also ensures that students develop positive attitudes toward ICT—in particular computer technology. Student's computer attitudes is often regarded as a significant variable to be studied as it can influence the extent of their computer usage as a learning tool [9,10,11]

### 2. Predictors of Computer Attitudes

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Recent studies have shown that users' beliefs—perceived usefulness and ease of using computers have a direct effect on computer attitudes [12,13]. Apart from these aforementioned predictors, personal traits such as gender [14] and age [15,16] have some effects on computer attitudes too. Tsai and Tsai [17] acknowledged the importance of the aforesaid predictors but echoed past researchers' [18,19] concerns that not much can be done on these personality traits such as beliefs, age and gender in order to enhance students' computer literacy—including computer attitudes. They suggested that learning strategies can boost students' computer literacy.

### **3. Learning Strategies**

Weinstein and Mayer [20, p.315] defined learning strategies as “behaviour and thoughts that a learner engages in during learning and that are intended to influence the learner's encoding process”. Learning strategies have been proven to improve learning effectiveness which translates into better performance for subject matters such as mathematics and science [21,22]. For computer related subjects, empirical studies on learning strategies are scarce. In fact, Tsai and Tsai [17] asserted that evidence are sorely lacking to show the association between learning strategies and contemporary computer literacy research. For this reason, Tsai and Tsai [17] embarked on a study to investigate if high school students' learning strategies were related to computer literacy which was measured in terms of computer achievement, computer attitudes and computer anxiety. Their study revealed that students who possessed higher order metacognitive skills were more likely to have better computer achievement, more positive computer attitudes and lower computer anxiety.

### **4. Objective of the Study**

This study sought to explore the relationship between learning strategies and computer attitudes among secondary school students who had opted to take a discrete ICT subject in schools.

## **5. Methodology**

### **5.1. Subjects and Procedures**

The target population of this study were secondary school students (Form 4/Grade10) from the state of Terengganu, Malaysia. One hundred and fifty five students were randomly selected for this study. There were 93 female and 55 male students who participated in the study. They were within the age range of 16 to 17 years old. All students had an average of 5.78 years of computer experience (S.D.=2.60). A survey method was used where questionnaires were administered to solicit information from the participants. The second author was present throughout the data collection stage at the randomly selected schools.

### **5.2. Instrumentation**

Two instruments were used in this study—the Learning and Study Strategies Inventory-High School Version (LASSI-HS) and the Computer Attitude Scale (CAS). The LASSI-HS was developed by Weinstein and Palmer [23] and comprised 10 sub-scales (attitude, motivation, time management, anxiety, concentration, information processing, selecting main ideas, study aids, self testing and test strategies). Items in the CAS were adapted from Albirini [24], Selwyn [9] and Soh [25]. The CAS comprised three subscales— affective, cognitive and behavioural.

### **5.3. Validation and Pilot Test**

Content validation of both instruments was established by two content experts. A lecturer with vast experience in the field of Psychology validated the contents of the LASSI-HS while another lecturer with vast experience in ICT validated the contents of CAS. The questionnaires were then pilot tested on 33 students who were not involved in the actual study. The overall Cronbach's alpha values for both instruments were above .80—indicating good internal consistency.

## **6. Data Analysis**

### **6.1. Coefficient Correlation Analysis**

The relationships between each of the ten learning strategies and attitudes towards computers were investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Correlation coefficients between the 10 components of learning strategies and attitudes towards computers are shown in Table 1. The results show that the scale—motivation ( $r=0.17$ ,  $p<0.05$ ) and time management ( $r=0.20$ ,  $p<0.05$ ) were significantly correlated with attitudes towards computers. The motivation and time management sub-scales were from the will and self-regulation components respectively.

Three other sub-scales—information processing ( $r=0.21$ ,  $p<0.01$ ), selecting main ideas ( $r=0.24$ ,  $p<0.01$ ) and test strategy ( $r=0.27$ ,  $p<0.01$ ) were more significantly correlated with attitudes towards computers. All three sub-scales were from the skill components.

The aforementioned results indicate that students who have higher motivation and good time management tend to have more positive computer attitudes. Students who have the ability to process information, select main ideas and prepare for tests are also more likely to have more positive computer attitudes as well.

Table 1. Correlation coefficients between learning strategies and attitudes towards computers

Learning strategies	Attitudes towards computers
Attitude	0.12
Motivation	0.17*
Time management	0.20*
Anxiety	-0.03
Concentration	0.12
Information processing	0.21**
Selecting main ideas	0.24**
Study aids	0.15
Self testing	0.14
Test strategy	0.27**

\* $p<0.05$ , \*\* $p<0.01$

## 7. Discussion and Conclusion

The present study suggests that learning strategies is associated with positive attitudes toward computers among students. This was in conformity with the findings of Tsai and Tsai [17]. They found that students with better learning strategies tended to have more positive attitudes toward computers. Their study revealed that “students with higher-order metacognitive skills in monitoring their comprehension, selecting main ideas and using resources helpful for learning tended to have higher computer achievement, better computer attitude and lower computer anxiety” (p.58).

The relationships between five learning strategies (motivation, time management, information processing, selecting main ideas and test strategy) and computer attitudes are definite, but small. Although the correlation coefficients were small, but they were found to be significant (Table 1). The significant positive association between motivation and computer attitudes indicates that students who are diligent with self discipline and are willing to work hard tend to possess positive computer attitudes. At the same time, the significant positive association between time management and computer attitudes suggests that those who are able to manage their time well will most likely have positive computer attitudes. Also, students who have good learning strategies especially the strategies of information processing, selecting main ideas and test strategies are inclined to have more positive computer attitudes. In other words, students with positive computer attitudes will most likely be able to use imagery, verbal elaboration, organization strategies and reasoning skills; pick out important information for further study and also apply the test preparation and test taking strategies in their computer learning environment.

Suffice to say, the results of the correlation coefficient analysis revealed that computer attitudes is related to selected learning strategies (motivation, time management, information processing, selecting main ideas

and test strategy). It is important to note that computer attitudes is more strongly associated with the skill component of the strategic learning (information processing, selecting main ideas and test strategy) as compared to the other two components—will and self regulation.

To conclude, it is important for students to be strategic learners and for teachers to emphasise on the aforesaid learning strategies during the ICT lessons. Strategic learners are more inclined to possess positive computer attitudes. Once students exhibit positive computer attitudes, there is a higher likelihood that they will be able to use computers successfully in their learning environments.

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## 9. References

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