COMPUTER ANXIETY: DATA ANALYSIS

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Abstract

With rapid changes in computer applications, computer users are facing continuous challenges in learning and adapting to these applications. With its current and advanced features, it is quite impossible for computer users not to use applications such as Internet, E-mails, Word Processing, Databases, Spreadsheets and etc especially in the workplace. Although many computer users are comfortable using computers, it is not surprising that some of them are struggling to interact with these applications. Several studies have reported the presence of computer anxiety among computer users in various organizations despite of them conducting scheduled trainings. Among computer users are employees in commercial banks. In the current study, data were obtained from a survey method and 319 samples were analyzed. Robust analysis was conducted to find the level of computer anxiety and the impact of attitude toward computer on these respondents when they were using various computer applications with their skills and knowledge besides several demographic items. Applying multiple regressions, the results indicate computer knowledge, computer skills and acceptance of technology have significant negative relationship on computer anxiety. The results suggest that computer users are not anti-technology as they need to use them in the workplace to perform various job activities. However, employed computer users are encouraged to manage their time wisely and give priority to performing job tasks than personal acts.

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1. Introduction

Technology has offered many creations and innovations through software applications. Known as computer applications, it pampers computer users to depend on various computer applications. It is true enough that it is difficult not to use computer applications in the workplace today. There are various job tasks that must be done using computer applications. For example, the Internet, E-mail, word processing, databases, spreadsheets, power-point slides and so on. They are widely and heavily used by working adults in many organizations. The usage of these computer applications has influenced the acceptance of user toward technology. Despite acquiring skill and knowledge when interacting with computers and their applications, many employees feel frustrated with the issues created by computers. This phenomenon is known as computer anxiety.

It was reported in the literature that students, teachers, managers and business professionals are among those who have experienced computer anxiety. A feeling of frustration while using computers occur either when the applications are complicated or too advanced to cope with or sometimes when the system is down or malfunction. Barcy and Barcy 2008 reported that higher and low task proficiency was correlated with computer anxiety. Apart from the reason mentioned early, past studies have also reported that computer anxiety was associated with anger; irritation; feeling of uneasy, and these feelings were associated with attitude toward computers (Weil & Rosen, 1999). For example, in an article written by Shepherd (2004), she reported the existence of computer anxiety among the respondents participating in her study.

However, she did not present the empirical evidence in her paper. Therefore, in the current study, robust analysis was done to extract more results in order to compare and to support with other studies. The study was conducted to determine the level of computer anxiety among employees in commercial banks. Further investigations were done to identify which determinants have influenced computer anxiety.

2. Literature Review

Earlier studies in computer anxiety were conducted as early as 1984 and the issues in technology with rapid changes in its creation and innovation have impacted computer users with a feeling of relief that computer technology has various applications. Technology has helped working adults to ease their workload, giving accurate calculations or deliver beautiful presentation of reports and many others. Computer users especially employees in business organizations interact with computers more than their official working time (Kupersmith, 1992) and widely and heavily use various applications such as the internet, e-mail, word processing, databases, spreadsheets and so forth (Miller, 1997).

However, the presence of this rapid development has given a state of frustration to some computer users. Computer anxiety has been addressed by many researchers. Most of the researchers agree that computer anxiety is related to negative emotional feelings associated with direct experiences. Interestingly, Howard (1986) addressed the source of computer anxiety, which was caused by the lack of operational experience with computers, inadequate knowledge about computer and psychological fear of technology.

There were interrelationships between computer use, perceived ease of use and perceived usefulness; and behavioural intention (Hsu, Wang & Chiu, 2009). Even Wilfong (2006) revealed in her study that self-efficacy beliefs, computer experience and computer use were strong predictors of computer anxiety and anger. Saade & Kira (2007) reported that computer experience, ease of use from technology acceptance model were strong predictors for computer novice to suffer anxiety symptoms when interacting with computers. Dyck & Smither (1994) also found that for both younger and older adults, higher levels of computer experience were correlated with lower levels of computer anxiety as well as a more positive attitude toward computers. As a matter of fact, computer knowledge mediated the effects
of age and education on computer interest (Ellis & Allaire, 1999). A study conducted by Parasuraman & Igbaria (1990) identified age, men and education to be negatively related to computer anxiety. Interestingly, there was a significant effect between computer confidence on task complexity and minimal computer-liking as reported by Chang (2005) when he conducted this study involving teachers. He argued that when teachers increased their computer experience through the accomplishment of various task levels this had helped them to minimize computer anxiety provided that teachers continuously enhance their knowledge and understanding task complexity.

The effect of computer experience on computer anxiety was also the interest of this researcher when he conducted a study on 101 undergraduates who enrolled in a teacher education course. He reported that many teacher trainees demonstrated a high degree of computer anxiety; however, when they gained computer experience, their level of computer anxiety was reduced (Anderson 1996).

2.1. Research Framework

Firstly, all the variables which had been selected as independent variables were integrated from previous researchers. For example, technology acceptance model was used as it was related to the usage of computers. Many studies have been using this model to describe the power of acceptance of technology. Furthermore, the items or dimensions contained in this model had been validated and reevaluated by many experts whom had used them in their research works (Adams, Nelson, & Todd, 1992).

Computer skills and computer knowledge were selected based on a study conducted by Shepherd (2004). In this study, she tested the level of computer anxiety among students, library staff and academicians from three different locations. However, in the article which had been generated from this study she did not reveal the details of the empirical results but only shared with readers the descriptive results. Hence, this gave an opportunity to the researcher to explore the data of the current study and revealed interesting results from the robust analysis conducted.

Another variable included as the independent variable was computer application, which was introduced by Miller (1997). Computer applications were useful to employees in easing them to perform various job activities that were routinely done. The efficient use of computer applications would result in low computer anxiety. The effective use of computer applications would also produce the same result (Emmon, 2003). Previous researches also revealed about the frequent use of these applications. In the current study, the researcher only chose six applications which were widely used by employees in many business organizations, including commercial banks. These were internet, emails, word processing, databases, spreadsheets and power-point presentation.

The current study also included attitude towards computer as the moderating variable. Parayitam, Desai, Desai, & Eason (2010) evidenced the impact of this variable on computer anxiety, satisfaction and stress on undergraduate students in a US university. It would be worthwhile to test the same variable on different subjects and locations. Furthermore, the results of the impact of the moderating variable on IV and DV would contribute to the body of knowledge as it was different from Parayitam et al.’s study. The presence of attitude towards computer would determine its relationship with computer anxiety. Logically, positive or high attitude towards computer would result in high acceptance of technology. The same goes with computer skills and computer knowledge. In the current study, attitude towards computer was chosen to moderate between technological changes and computer anxiety.

3. Methodology

3.1 Sample population
Specifically, both executives and non-executives were involved in this study. Employees from commercial banks were selected in the study because they were the people who directly used computer applications, computer skills and computer knowledge when performing various job tasks. In 2006, Chew, Poon and Rahim investigated the relationship between job stress and the layout of the office or ergonomics. Furthermore, previous studies highlighted various locations to study computer anxiety but very few were done for commercial banks especially in the Kuala Lumpur area. This presents an opportunity to the researchers to extend the research in this area.

3.2 Data Analysis Procedure

The SPSS was used to analyze the data. The SPSS can calculate the score of computer anxiety by providing the correct figure and grouping them according to the level of computer anxiety. For example, scores of no computer anxiety, low computer anxiety and moderate/high computer anxiety. Besides, the software could also provide the output which was easy to interpret. Furthermore, it could show the direction of the relationships between the independent and dependent variables. Graphs will be presented to further explain the results of the study. Some of the demographic profiles were tested in the current study. For example, those with two categories were tested using t-tests and those items with more than two items used the Anova test to seek the relationship of the variables. The t-test was used to seek the differences in the mean scores and the values of the standard deviation. Since the data of the current study was normal, the Pearson Correlation Coefficient was used to test all the research questions and hypothesis.

3.3 Sampling Technique

Random sampling was used in this study. Using a random sample is an important aspect of survey research and to ensure that the results are representative of the target population. Random sampling had enabled the researcher to successfully generalize the survey results to the target group. Random sampling could be achieved with two requirements: i. Randomness: an equal chance of selecting any member of the population or “probability sampling”. ii. External selection: respondents were chosen to participate rather than deciding to take the survey themselves.

In the current study, it was estimated that 20,000 employees are working for commercial banks based on the statistics given from each bank located in the headquarters. Based on Kertcie and Morgan (1960), 377 were required for data analysis. When the researcher estimated that about 70 percent of employees would complete the survey, with 5 percent error tolerance, the number of questionnaires distributed turned up to 539. However, this figure had been rounded-up to 550. 333 cases were returned and only 319 were analyzed; this brought to the percentage of return rate to 88.3 percent (333/377). The unit of analysis was employees from commercial banks located in Kuala Lumpur (Sekaran, 2003).

3.4 Data Collection Procedure

The employees in commercial banks located in Kuala Lumpur were identified to participate in the study. The main aim was to get as many responses as possible. The bank managers were given a short brief as to how the questionnaires should be distributed randomly to both executives and nonexecutives in the department. A cover letter was attached with each of the questionnaires before distribution was administered by the bank managers. The employees were requested to respond within a few days before returning them to the manager. Those responded questionnaires were returned to the researcher for further checking and screening.

3.5 Instruments
All the instruments used in this study were taken from established questionnaires which have been used by former researchers. Based on the literature, all these instruments had been tested for their reliability and validity and the Cronbach’s Alpha scores were more than 0.7 which means these alpha scores were acceptable in order to proceed with further data analysis.

1. Technology Acceptance Model (TAM) was developed by Davis (1989). It has 12-item statements. The Cronbach’s alpha score in the current study was .94.
2. Computer skills and computer knowledge were developed by Shepherd (2004) with 5-item statements each. The score was .82 and .86 respectively.
3. Computer applications were identified by Miller (1997) and applications included the frequent use of computer users.
4. Attitude towards computer was the moderating variable of the study. The scale measuring attitude towards computer was developed by Nickell & Pinto (1986). It has 12 items with negative statements and the values were reversed in order to get accurate results for the analysis. The alpha score was .79
5. Computer anxiety was the dependent variable in the current study. Computer Anxiety Rating Scale (CARS) was used to measure computer anxiety (Heinssen, et al., 1987). It has 9 negative statements. The values were reversed to get accurate results for the data analysis. It has alpha score of .88.

4. Research Results

4.1 Level of computer anxiety

A scale called “Computer Anxiety Rating Scale (CARS)” was meant to measure the level of computer anxiety (Heinssen, et al., 1987). Computer anxiety was introduced in 1984 and is still seen in many studies conducted on this topic. Studies have explored more by indicating or searching for the causes and factors. Many studies conducted in the USA had reported the presence of computer anxiety among business professionals, educators, students and many others. Therefore, getting to know the level of computer anxiety among employees in the current study will add to the body of knowledge as the study was conducted for commercial banks located in the Kuala Lumpur area. The importance of the measurement would identify the status of interaction with computers among employees as individuals would have different computer skills and knowledge in handling computers. Secondly, the importance of the measurement would induce the top management to properly strategize any training that needs to be given to all computer users or employees as these people are directly using computer applications.

4.2 Summary of research results

Some items in the demographic profile were tested using t-tests and Anova to see the differences and relationship of the items when the groups were experiencing computer anxiety. The preliminary results of the demographic profiles are as follows:

1. 43 percent of the respondents in the study experienced low computer anxiety.
2. In terms of gender, there was no difference with the scores of computer anxiety.
3. Non-executives experienced higher computer anxiety than executive employees.
4. T-test showed that younger adults experienced higher computer anxiety than middle-agedadults.
5. As for the race, Chinese employees experienced higher score of computer anxiety than the Malays and others.
6. In terms of education background, employees with only SPM/MCE certificates experienced higher score in computer than those with higher level of education.
7. Employees who have served 1-10 years in the premise experienced higher score in computer anxiety than those with 11 to 19 years of service and 20 to 30 years of service.

The results of the current study revealed that 43 percent of the respondents working for commercial banks experienced low computer anxiety. This result is in line with previous researchers (Bozionelos, 1996; Korobili, et al., 2010; Saadé & Kira, 2007). In terms of gender, the results of t-test in the current study confirmed that there was no gender difference in the score of computer anxiety. Todman (2006) reported similar result in his study. However, this result contradicted with a study reporting that female staff experienced higher computer anxiety than male staff (Emmon, 2003; KianSam & Chee-Kiat, 2002).

In the previous studies, female respondents were the teachers, business managers and professionals, students, bankers and so on. Regardless of the gender, it is very important to participate in learning and adapting to new applications implemented in the workplace. The process could be in a series of training or self-learning through reading the manual. This process would take time and patience and the feelings of acceptance and resistance towards technology or application varied from one individual to another individual. Sometimes, the process of adapting or to get familiar with certain applications depends on the age and education background of the respondents.

Employees working for commercial banks were from different education background. It was proven from the Anova tests that those who held SPM/MCE had experienced computer anxiety more than other higher qualifications. This means that these employees were not sure or having insufficient experience in terms of their computer skills and computer knowledge. It could also be lack of working experience (Igbaria & Chakrabarti, 1990) in handling work activities using computer applications (Miller, 1997) that contribute to experiencing computer anxiety. As revealed in the findings as well, employees with low attitude toward computer experience higher computer anxiety although their computer skills are high. The same goes with high attitude towards computer whereby they also experience computer anxiety even though they have high computer skills, but the statistics were not as bad as employees with low attitude towards computers.

4.3 Correlation Results

Table 1. Correlation Between Variables

<table>
<thead>
<tr>
<th>Items</th>
<th>Attitude toward computer</th>
<th>Technology Acceptance</th>
<th>Computer Skills</th>
<th>Computer Knowledge</th>
<th>Computer Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Anxiety</td>
<td>-.721</td>
<td>-.374</td>
<td>-.583</td>
<td>-.202</td>
<td>-.153</td>
</tr>
</tbody>
</table>

There is significant negative relationship between computer anxiety and other variables in the study. Based on the specific results, there is high negative relationship between computer anxiety and attitude towards computer. But, there is negative moderate relationship between computer anxiety and computer skills. However, there is negative low relationship between computer anxiety and computer knowledge. Lastly, there are small relationships between computer anxiety and computer knowledge, and computer anxiety and computer applications.

In the previous studies, computer anxiety has significant impact on computer use (Igbaria & Chakrabarti, 1990), computer skills (Harrison & Rainer, 1992), attitude towards computer (Compeau & Higgins, 1995). Logically, employees with positive attitude towards computers, when they are interacting
with computers, they probably know that they must be serious and focused on the job. Usually, individuals with positive attitude towards computers are very committed and hardworking.

These individuals must have been very familiar with new applications by signing up for training courses to learn and adapt themselves to use various applications correctly. Actually, there are many ways for the employees to maintain positive attitude towards computer. First, accept the new technology although in general humans usually resist to changes. Usually what happens is that when they get familiar with the new technology, they will not want to change. This cycle will only stop when the company changes to a different management.

4.4 Computer skills and technology acceptance constitute to computer anxiety

A stepwise multiple regression analysis was carried out to assess the relative contributions of technology acceptance, computer skills, computer knowledge, and computer applications. Computer skills alone explained 34 percent of the variance in computer anxiety. With the value added by technology acceptance, it explained an additional 1.2 percent of the variance in computer anxiety for a total of 35.2 percent. Both of these independent variables were statistically significant contributors, with p-value < .05. Other independent variables were not statistically significant in this assessment.

Based on the literature, working adults who have been using computers in the workplace feel familiar with the applications and logically they will have low computer anxiety. However, the results in the current study revealed that high computer skills result in high computer anxiety. Probably, this is due to rapid changes in technology and computer applications, so those employees will have to learn and adapt with these new applications. At that particular time, their level of computer anxiety will obviously be high. Most likely, they are experiencing time constraints to meet deadlines for submission of reports or outputs to their superior. That is why although the computer skills are high, but their interaction with computer applications, for example, having difficulty to troubleshoot any malfunction in addition to using complex or complicated databases or spreadsheet, will lead the employees to experience high levels of computer anxiety. Furthermore, more than 95 percent of the employees are using various computer applications mentioned earlier in the workplace. In the current study, 43 percent of the respondents experience computer anxiety. Lack of operational experience and inadequate knowledge about computers are some of the causes why computer users are experiencing computer anxiety (Igbaria & Chakrabarti, 1990). They affirmed that computer users would minimize their usage besides having negative attitude toward computers due to insufficient knowledge of computer-based learning (Igbaria & Chakrabarti, 1990).

4.5 The impact of attitude towards computer on computer skills and computer knowledge as well as on computer anxiety.

In the current study, hierarchical regression was conducted to test the moderating effect of attitude towards computer on the relationship between the variables relating to technological changes, and computer anxiety. The results revealed that attitude towards computer do moderate the relationship between computer skills and computer knowledge, and computer anxiety.
Table 2. Coefficients Regression for Interaction of Computer Anxiety

<table>
<thead>
<tr>
<th>IV*MV</th>
<th>Technology</th>
<th>Acceptance*Attitude</th>
<th>Toward Computer</th>
<th>Computer Skills*Attitude</th>
<th>Toward Computer</th>
<th>Computer Knowledge*Attitude</th>
<th>Toward Computer</th>
<th>Applications*Attitude</th>
<th>Toward Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>-0.030</td>
<td>0.111**</td>
<td>-0.117**</td>
<td>0.055</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| R²                          | 0.356      | 0.602               | 0.626            |
| ^R²                         | 0.356      | 0.246               | 0.023            |
| F                           | 43.405     | 94.851              | 57.428           |
| P                           | 0.00       | 0.00                | 0.00             |

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>-0.114*</td>
<td>-0.059</td>
<td>-0.067</td>
</tr>
<tr>
<td>Acceptance</td>
<td>-0.516**</td>
<td>-0.270**</td>
<td>-0.281**</td>
</tr>
<tr>
<td>Computer Skills</td>
<td>0.075</td>
<td>0.078**</td>
<td>-0.067</td>
</tr>
<tr>
<td>Computer Knowledge</td>
<td>0.015</td>
<td>0.031</td>
<td>-0.003</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MV</td>
<td>Attitude Toward Computer</td>
<td>-0.570**</td>
<td>-0.542**</td>
</tr>
</tbody>
</table>

4.6 The interaction of attitude towards computer on computer skills and computer anxiety

Figure 2 reveals the impact of attitude towards computer on computer skills and computer anxiety. It shows that employees with low attitude towards computer resulted in low computer skill, but high in computer anxiety. The impact was lower for employees with high attitude, but still their computer skills
are higher but a little lower on computer anxiety. This lower computer anxiety was not as high when compared to employees with low attitude towards computer.

Figure 2  Interaction of attitude towards computer on computer anxiety and on computer skill

4.7 Interaction of attitude towards computer on computer anxiety and computer knowledge
Figure 3 revealed the impact of attitude towards computer on computer knowledge and computer anxiety. It showed that employees with low attitude towards computer experienced high computer knowledge and also high computer anxiety. However, employees with high attitude towards computer experienced high computer knowledge but low computer anxiety. The possible reason being proper training or regular training were lacking so the results revealed low attitude towards computer among the employees impacted high computer anxiety although having higher computer skills. The same goes with employees having high attitude towards computer. The impact was not as bad one employees with high attitude towards computer although they were also experiencing higher computer skills and a bit lower on computer anxiety.

Figure 3 explained that various activities were performed by employees using various computer applications. These applications may be either easy to adapt to by those who have high computer knowledge with high attitude towards computer. However, complex or complicated applications or having many trouble shootings may depress the employees to accept these applications if the attitude towards computer of the employees were low; of course this would lead to high computer anxiety. It could be possible that rapid changes in technology demanded employees to master and acquire computer knowledge. So, computer anxiety is related to high and low task proficiency (Barcy & Barcy, 2008). Moreover, with different backgrounds of employees, this may hinder the mastering of computer applications; thus, there will be a possibility that they will experience computer anxiety although at a low level.

5. Conclusion

Rapid changes in information technology demand business organizations to provide up-to-date facilities and computing environment to expose employees with the latest computer applications. The findings of the present study indicate that either with low or high attitude towards computers, it does affect computer skills and computer anxiety. Computer skills have a quite strong effect on the level of computer anxiety. Therefore, a study on computer anxiety does not mean that computer users are antitechnology (Rosen & Weil, 2000). The most important thing is to manage the usage of those applications effectively so that routine jobs that depend on technology can be accomplished smoothly without much of a frustration. This is because the presence of computer technology does come as a package with computer anxiety. Therefore, with the right computer skills among the employees, this
could minimize the level of computer anxiety. As the literature suggests this could be done by the business organizations focusing on computer training, computer-supported collaborative learning, promoting social interaction, implementing some innovative learning methods and avoiding negative consequences (Parayitam, et al., 2010; Sanderlin, 2004).

References


