COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS AT UNIVERSITI TEKNOLOGI MARA (UiTM), MALAYSIA

by

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ABSTRACT

This study was designed to determine the levels of computer anxiety, computer self-efficacy, and computer applications usage among members of the Faculty of Accountancy at Universiti Teknologi MARA (UiTM), Malaysia. The importance of the role of technology and information systems in economic development has grown significantly throughout the globe, thus affecting how nations educate students in order to produce a more technologically literate workforce. With the implementation of the smart schools concept in Malaysia, whereby these facilities are equipped with multimedia technology and world-wide networking, educators in higher learning institutions have to prepare themselves for high school graduates who will be technologically literate. While there have been much research in this area conducted in the United States at many different levels, it has never been conducted in Malaysia, specifically with the accounting faculty at UiTM. Therefore, a total of 368 full-time accounting faculty members who were teaching in the 2006/2007 academic year were surveyed, using questionnaires. The questionnaires were focused on obtaining information with regard to participants and computer: (a) anxiety, (b) self-efficacy, (c) and software usage, as well as (d) general information. At the end of the data collection period, 262 responses were received from the population. A test of the nul1 hypothesis revealed no evidence to imply that the respondent group's gender and UiTM location distributions were significantly different from the population distributions based on the same attributes. Together with a high response rate (71%), these findings add credibility to the belief that the sample was representative of the population. This study showed that a majority of the faculty had low levels of computer anxiety and high levels of computer self-efficacy. Statistical analysis showed no significant mean differences between gender and age categories nor was there an interaction between the two said variables related to computer anxiety.

However, pertaining to computer self-efficacy, the study found a statistically significant mean difference between age categories. Furthermore, the results from stepwise multiple regressions also indicated that the most efficient model for predicting the level of computer anxiety was composed of a single variable, computer self-efficacy.

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Chapter 1

Introduction

The advent of technology and information systems and their importance in economic development has caused nations to create a more technologically literate workforce. As a nation, Malaysia intends to be a fully developed country by the year 2020, and it has embarked on various information technology projects that will keep it abreast with the information era (Hamid, 1993). Malaysia plans a more widespread use of computers and related information and communications technology in educational areas to ensure that graduating students are proficient in the use of such technology.

To achieve this objective, the Malaysian government has formulated plans to improve the education system through the implementation of "smart schools." These are equivalent to the American middle and high schools and are facilitated with multimedia technology and world-wide networking. The curriculum for these schools is to be individually-paced and include self-directed learning experiences. In 1999, the student-centered, open-ended curriculum was implemented in 90 pilot schools throughout the country (Ministry of Education Malaysia, 1999). The Ministry of Education has estimated 10,000 smart schools with an enrollment of over 5.8 million students and 450,000 teachers will exist throughout the country by the year 2010. This vision has serious implications not only for teachers in those schools, but also for higher education institutions when these students graduate from high school.

All higher education institutions in Malaysia will be affected by these developments including the Faculty of Accountancy at Universiti Teknologi MARA (UiTM). Since high school graduates will already be technologically literate, it is vital for educators in institutions of higher education to provide experiences to further develop and strengthen the students' information

technology capabilities. The accountancy faculty has a major role to fill in producing qualified accountants with knowledge and skills in accounting and the ability to apply technology to the practice of accounting. In order to meet this demand, faculty members also need the skills and competencies to use those technologies. Accounting education is in a period of profound change, especially with the advent of information technology.

In recent years, there have been calls for changes in the education curriculum to improve the quality of education to sufficiently train students to adapt to the workplace (Braathen & Robles, 2000; Brown, 2000) especially with jobs that involve the use of computer technology. This also applies to the accounting subjects with an increased emphasis on knowledge and skills related to information technology, computing, and accounting systems. Moreover, the American Institute of Certified Public Accountants (AICPA) (1999) stated that accounting educators who use technology in their classes help students to both develop technical literacy and master accounting content. Applications software (such as word processing, spreadsheets, presentation, accounting, and auditing software), the Internet, e-mail, and other technologies can help educators manage and improve instruction as well as teaching content. Technically, accountants should be able to communicate with their colleagues and experts in their field. Thus, accounting educators should be able to accomplish similar tasks with other professionals, as well as with their students, and be able to identify and use new instructional methods and resources in their instruction.

In the last two decades, paradigms for teaching accounting have evolved at a rapid pace. Fast-paced advances in computer technology and software have consequently induced significant changes in teaching accounting. Further, potential employers are looking for graduates with computer skills who will provide them with a competitive advantage in the business world.

Hence, the education provided to students while they are in college should have some amount of practical usage, especially in the area of computer literacy. All of this has already led to the evolution of the teaching process that has begun integrating technology into the educational curriculum to provide students with meaningful activities.

Globally, computer technology is changing the way educators teach and students learn. Therefore, the accounting faculty, staff, and administrators need to understand what can and cannot be achieved with the current technology to allow them to utilize the maximum potential of technological innovation. This advancement can be a critical component to the educational experience, opening more opportunities for learners and educators, thus providing a skilled workforce for the nation's economic development. These developments and challenges have serious implications for the accounting faculty at UiTM. The faculty is expected to teach using technology as well as the traditional face-to-face approach. The faculty must also be computer literate and competent enough to use those technologies that are available and to become innovative and receptive to change by knowing the strengths and the limitations of the technological tools available.

Statement of the Problem

Technology has advanced remarkably in recent years, providing faculty in higher education institutions with many new opportunities to apply electronic technological innovations. Schunk (1989) mentioned that even though positive outcome expectations regarding the use of computers are important, they do not guarantee specific behavior. If high computer anxiety and low computer self-efficacy exist among educators, they may choose not to use this computer technology even though they believe that computers will lead to improved teaching and learning (Delcourt & Kinzie, 1993; Savenye, Davidson, & Orr, 1992). Further, the advent of

technology has also impacted businesses, and a skilled workforce is sought by companies to provide competitive advantages against their competitors.

Currently, most accounting subjects are being taught in traditional classrooms at UiTM. With the development of technology and implementations of online learning in other colleges and the demands for a skilled workforce, the institution has been challenged to make a shift to virtual classrooms as well as provide students realistic experiences in the applications of technology. UiTM's accounting faculty is now obligated to be knowledgeable and confident of their ability to use the new emerging computer technologies to deliver instruction more efficiently and effectively. However, little is known about the characteristics of the accounting faculty members regarding computer anxiety, computer self-efficacy, and computer applications usage. There is also little evidence that accounting educators at UiTM are integrating computer technology into their instruction. Without this information, the Malaysian government cannot develop a realistic plan to achieve a technologically literate workforce by the year 2010.

Purpose of the Study

The purpose of this study has been to determine the extent to which selected variables are related to computer anxiety and computer self-efficacy of the faculty members of accountancy at UiTM. With the current implementation of smart schools by the Malaysian government, students graduating from such schools are more computer literate when they enroll in higher institutions as compared to students prior to implementation of the said education system. Accounting educators at UiTM need to keep abreast with students' educational development and with technologies as well. Thus, it was necessary for the researcher to determine the levels of computer anxiety and self-efficacy of the educators since these factors have been proposed as predictors of individuals' willingness to use computer technology.

Levels of computer anxiety, computer self-efficacy, and their relationship to selected demographic variables were examined as well as the relationship of those selected demographic variables to computer applications usage. Those variables found important can serve as a guide to faculty and administrators in their future efforts to facilitate the integration of computer technology into face-to-face instruction or online education.

Research Questions

1. What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based upon gender and age categories?
2. To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, hours of formal computer training, years of computer experience, years of computer use in instruction, and location)?
3. To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based upon the same selected characteristics?

Rationale for the Study

The rapid change in technology has a great impact on all aspects of human life and poses a particular challenge to the education system. This study has focused on the influence of a multi-faceted set of variables upon the attitudes towards computers and the use of technology by UiTM accounting faculty members in instruction. Its significance lies in its ability to provide additional information regarding the variables and factors that are influential in the use of

technology and the types of attributes associated with integrating computer technology into instruction. While such research has been conducted in the United States at many levels, it has not been conducted in Malaysia, specifically with the accounting faculty at UiTM.

Benefits of the Study

The results of this study will reveal the current level of computer anxiety, computer self-efficacy, and computer applications usage by members of the faculty of accountancy at UiTM. It will provide an insight into how often computers are being integrated and used in classrooms. Since this higher educational institution is shifting toward integration of technology and computers in the classroom to provide a skilled workforce, findings from this study may contribute to the understanding of the computer proficiency among educators. In addition, it may also be used to help the development of more effective and efficient programs to enhance educators' computer knowledge. For example, it could be used to help design new seminar approaches to raise educators' levels of computer self-efficacy in using computer technology. Further, the findings may help to identify areas of weakness in the current group of faculty members to allow improvements to be made to reduce those inadequacies. The study also provides a baseline of the level of computer integration within the overall educators' preparation curriculum to teach accounting subjects. The instruments in this study provide useful information for faculty members to examine their own computer integration efforts and to establish a focus for future personal development.

The results of this study will also be useful to determine if the faculty members have sufficient computer exposure and training to keep abreast with current technology. The findings can further be used as an input that needs to be seriously considered during the design stage of new course curriculums that involve the use of computers in classrooms. Finally, the study will

serve as a foundation for the research in other higher educational institutions involving use of technology in classrooms that needs to be studied in order to help Malaysia achieve its 2020 vision of being a fully developed country.

Delimitations

This study was delimited to a single higher education institution in Malaysia and a single subject area. The results of this study cannot be generalized to all educators in Malaysia.

Limitation

The faculty dispositions, opinions, and perceptions of computer anxiety and computer self-efficacy were assessed through self-reported measurement.

Definition of Terms

Some of the terms used in this study have other, more common, generic meanings, but for this study they will be defined as follows:

Anxiety - A physiological state that is portrayed by cognitive, somatic, emotional, and behavioral components and that creates feelings of nervousness, fear, worry, or apprehension. (Seligman, Walker, & Rosenhan, 2001).

Computer anxiety – Emotional fear, apprehension, and phobia felt by individuals toward interactions with computers or when they think about working with a computer (Herdman, 1983).

Computer self-efficacy – A measure of an individual's judgment of his or her own abilities with computers, an assessment of self-confidence (Durndell, Haag, & Laithwaite, 2000).

Faculty - Full-time instructional staff appointed and employed by Universiti Teknologi MARA. The word may be used interchangeably with the word “educator” or “lecturer.”

Self-efficacy – "Beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3).

Summary

The Malaysian government has implemented smart schools where students have hands-on experience with computers in order to become a fully developed nation and provide the employment market with a skilled workforce by 2020. Upon their high school graduation, these students will have some computer proficiency before entering institutions of higher learning. While these colleges have begun integrating technology and computers in classrooms, there has not been any research conducted to ascertain the rate and the extent of integration, the baseline computer experience among the faculty members, or their levels of computer anxiety or computer self-efficacy with regard to computer usage.

Chapter 2

Literature Review

This chapter reviews the literature that establishes the basis for the study. The purpose of this study has been to determine the extent to which selected variables and factors affect the computer anxiety and computer self-efficacy of the faculty of accountancy members at UiTM, and the extent of their use of technology in instruction. Therefore, a thorough study of the available literature was conducted on specific topics to identify how different factors may impact the faculty members' computer anxiety and computer self efficacy.

The review of literature begins with the understanding of the different definitions and interpretations of anxiety and how these emotional responses may affect the respondents' level of confidence and involvement with technology. The second section specifically examines anxiety related to computer usage and the findings of previous research regarding the causes of such apprehension and its impact on the computer integration process. It also includes discussion on computer anxiety scales that had been used in previous research. The next section examines self-efficacy and its impact on confidence and motivation when working with technology. Computer self-efficacy, the fourth topic in this chapter, explores faculty levels of confidence while working with computer and technology. The section discusses in depth the computer self-efficacy scales that had been used in previous studies. The fifth section discusses reasons for an inverse relationship between computer anxiety and computer self-efficacy. Since the study focuses on accounting educators and their computer usage, it is only appropriate to focus on their roles in preparing students for a challenging business world. Finally, the researcher discusses the demographic variables previous studies found to be related to computer anxiety and computer self-efficacy.

Anxiety

There are many definitions and interpretations of anxiety; however, they all refer to a complex combination of negative emotional responses that include worry, fear, apprehension and agitation. These responses are generally learned from direct experiences when a person comes in contact with a threatening object or situation.

The most common types of anxiety are generalized anxiety disorder, panic disorder, social anxiety disorder, phobias, obsessive-compulsive disorder, and post-traumatic stress disorder. However, when it comes to technology, Oetting (1983) identified three types of anxieties (a) trait, (b) state, and (c) concept-specific. The author described trait anxiety as the general pervasive anxiety experienced by a person over the entire range of life experiences. Trait anxiety is frequently used as a construct for personality, learning theory, and psychopathology since people who exhibit trait anxiety are chronically anxious and constantly under tension regardless of their situation (Martin, 1998). Howard and Smith (1986) stated that a high trait anxious person will exhibit computer anxiety more than a low trait anxious person. Oetting explained that state anxiety was a feeling a person experienced at a specific time. When a person experiences anxiety, the feelings fluctuate over time and react to a responsive situation. It is related to a person's learning background. The individual may have experienced some anxiety in a specific situation and that feeling is transferred to another similar situation. Concept-specific anxiety is a transitory-neurotic type of anxiety. This is the range between the trait and state anxieties that is associated with a specific situation. The concept-specific anxieties "fill the gigantic range between general trait anxiety and state anxiety" and are "an anxiety that people associate with specific situations" (Oetting, 1983, p. 1).

Eysenck and Calvo (1992) categorized anxiety into two distinct areas (a) worry, and (b) cognitive arousal. The authors stated that when anxiety produces worry, it has a tendency to decrease an individual's ability to concentrate on a task. The cognitive arousal effect, on the other hand, influences a person's alertness and ability to do a task. The combination of the worry and arousal components yields processing efficiency, which are the mental performance and the state of mind of an individual. Seligman, Walker and Rosenhan (2001) described anxiety as having cognitive, somatic, emotional, and behavioral components that entail expectations of a diffuse and uncertain danger.

Computer Anxiety

There are many definitions of computer anxiety, and researchers have not agreed upon a standardized one. Oetting (1983) stated that computer anxiety is a concept-specific anxiety because it is a feeling that is associated with a specific situation, in this case when a person interacts with computers. He elaborated by saying that computer anxiety is "the anxiety that people feel they will experience when they are interacting with computers--the anxiety associated with the concept of computers" (p. 1). Herdman (1983) defined computer anxiety as emotional fear, apprehension, and phobia felt by individuals towards interactions with computers or when they think about using computers. Cambre and Cook (1985) stated that computer anxiety is a form of state anxiety, and it was brought on in part by the rapidly changing nature of new technology and the subsequent pressure for social change in modern time. Howard and Smith (1986) defined computer anxiety as "the tendency of a particular person to experience a level of uneasiness over his or her impending use of a computer" (p. 18). Heinssen, Glass, and Knight (1987) stated that computer anxiety refers to negative emotions and cognitions evoked in

actual or imaginary interactions with computer-based technology, and it affects the utilization of computer-based technology and performance on tasks that involve the use of computers.

Stone, Arunachalam, and Chandler (1996) concluded that computer anxiety is a psychological construct that is related to, but distinct from, computer self-efficacy. Rosen and Weil (1990, 1995) described computer anxiety as "technophobia" and used the term "cyberphobia" to describe individuals who are frightened by the use of computers and technology. Computer anxiety has also been classified as a complex psychological construct that cannot be fully described from a single perspective (Chua, Chen, & Wong, 1999). Chua et al. simply generalized the definition of computer anxiety as "a kind of state anxiety, which can be changed and measured along multiple dimensions" (p. 611).

Other researchers have broken up computer anxiety into sub-components. For example, Maurer and Simonson (1984) categorized behavioral manifestations of computer anxiety to include (a) avoidance of computers and the general areas where computers are located, (b) excessive caution with computers, (c) negative remarks about computers, and (d) attempts to cut short the necessary use of computers. Marcoulides and Wang (1990) further expanded computer anxiety as general computer anxiety and equipment anxiety. V. McInerney, D. M. McInerney, and Sinclair (1994), on the other hand, characterized four sub-components of computer anxiety which are (a) learning anxiety, (b) computer equipment anxiety, (c) computer message anxiety, and (d) computer observing anxiety. While there are many definitions and components of computer anxiety, few studies have attempted to identify the source of it.

Howard and Smith (1986) proposed sources of computer anxiety and identified those as (a) lack of operational experience with computers, (b) inadequate knowledge about computers, and (c) psychological makeup. They theorized that computer anxiety based on the lack of

operational experience with computers is the easiest to treat, computer anxiety arising from knowledge-based origins is of intermediate difficulty to treat, and computer anxiety based on an individual's psychological makeup is the most difficult to treat. Reports of previous studies have shown that computer anxiety has a significant impact on computer-related activities such as computer use (Igbaria & Parasuraman, 1989), computing skills (Harrison & Rainer, 1992) attitudes toward computers (Compeau & Higgins, 1995), intentions to use computers or software applications (Elasmar & Carter, 1996), and perceived ease of use (Venkatesh, Morris, & Ackerman, 2000). These findings showed that computer anxiety increases resistance to computer technology and represents a hurdle to an individual's involvement with computers (Howard & Smith, 1986).

Computer anxiety has also been claimed to be the cause of serious economic costs in the United States (Mahar, Henderson & Deane, 1997), and it is estimated that the figure reaches billions of dollars annually (Edler, Gardner, & Ruth, 1987; Gardner, Young, & Ruth, 1989). Torkzadeh and Angulo (1992) stated that computer anxiety can be changed with appropriate training. Bozionelos (2001) further stressed the importance of research in this area to uncover the correlations and patterns of relationships for deeper insight into treatment purposes and to increase productivity. Beckers, Wicherts, and Schmidt (2006) concluded that computer anxiety appears to harbor components of trait anxiety that will negatively influence the success of treatments that are solely focused on teaching computer users the complexities of various applications.

Measuring Computer Anxiety

There are many researchers who have developed scales to measure computer anxiety. Studies have focused on the various factors involved in this phenomenon such as gender,

computer experience, parental and peer influences, self-efficacy. Maurer and Simonson (1984) designed the Computer Anxiety Index (CAIN) that uses a 26-item Likert-like scale that measures participants' anxiety toward computers by examining avoidance, negative attitudes, anxiety, and computer comfort.

Rosen, Sears, and Weil (1987) introduced Computer Anxiety Rating Scales (CARS) to measure a variety of aspects and features of technological anxiety. These include "anxiety about the machines themselves, their role in society, computer programming, computer use, consumer uses of technology, problems with computers and technology and technology in the media" (Rosen et al. 1990, p. 9). This scale is different from the one developed by Heinssen et al. (1987) but has the same name.

The Computer Anxiety Rating Scale (CARS) developed by Heinssen et al. (1987) has been cited in many studies. This scale, a self-report inventory designed to assess individuals' levels of computer anxiety with a 19-item questionnaire, is based on a five-point Likert scale (1=strongly disagree to 5=strongly agree). The instrument was administered to 270 introductory psychology students in a university. Participants responded to items such as technical capability, appeal of learning about and using computers, being controlled by computers, learning computer skills, and traits to overcome anxiety. The instrument could also be used to identify individuals who would benefit from counseling to overcome their anxiety of using computers. The authors also included information on the relationship between computer anxiety and math and test anxiety, the amount of computer experience, cognitive styles, mechanical interests, and SAT scores. The authors reported high internal consistency of the entire instrument with Cronbach alpha = .87, and that it was reliable ($r = .70$, $p < .0001$) and stable ($t = -1.06$, $p < .30$). This was

corroborated by both Coakes and Steed (2003) and Pallant (2001) who have written that alpha values above .70 are sufficient to demonstrate reliability.

Meier (1988) introduced a Computer Aversion Scale that consists of 31 items, using a true-false scale to produce four scores for computers (a) efficacy expectations, (b) outcome expectations, (c) reinforcement expectations, and (d) total score of the cumulative effects of reinforcement, outcome, and efficacy expectations. This scale was designed to be used with mental health clients and workers, high school age, and older.

To measure computer anxiety, Harrison and Rainer (1992) used the CARS developed by Heinssen et al. (1987) administered to 693 university personnel perceptions regarding specific computer-related knowledge and skills. The data were analyzed using principal components factor analysis as the extraction technique and orthogonal rotation to examine the construct validity of the 19-item CARS. The authors' study produced two factors (a) high anxiety toward computer use, and (b) confidence, enthusiasm and/or anticipation of computer use. The authors reported Cronbach alpha coefficients concerning the internal consistency of the sub-scales of .84 and .85 respectively. There was, however, little agreement as to the specific factors to measure computer anxiety among respondents.

Summary

There are many definitions of anxiety and computer anxiety. All of those concerning anxiety seem to agree that it relates to negative emotional feelings associated with direct experiences or situations. Similarly, for computer anxiety, some researchers have even categorized its sub-components. Researchers believe that computer anxiety has a great impact on the economy and personal development. However, of the many studies reviewed, only one dealt with the source of computer anxiety, stating that it was caused by the lack of operational

experience with computers, inadequate knowledge about computers, and psychological fear of technology (Howard, 1986).

There are also many types of instruments to measure computer anxiety. Among the notable scales are Maurer and Simonson's (1984) CAIN, Rosen et al.'s (1987) CARS, Heinssen's et al. (1987) CARS, and Meier's (1988) Computer Aversion Scale. It was important to note that Heinssen's et al. CARS was cited in many research reports by other researchers when dealing with computer anxiety.

Self-Efficacy

Self-efficacy is an important psychological construct in understanding the reason people choose to pursue particular activities and the extent of effort they devote to these. Self-efficacy is a result or outcome of the belief that one has the confidence and the ability to execute the courses of actions required to deal with a given situation in which they are trained. Bandura's (1997) construct of self-efficacy has been widely used in research on human motivation and goal attainment. He defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3).

Bandura (1997) stated that there are four main sources that influence self-efficacy: (a) mastery experiences, (b) vicarious experiences, (c) social persuasion, and (d) physiological and emotional states. The mastery of experiences is a combination of cognitive and behavioral tools to create a successful, appropriate course of action to control a situation. Vicarious experiences occur when an individual sees another individual succeeding in a task then feels compelled to strive for the same mastery. On the other hand, if a person sees another failing at a task, this may undermine the level of motivation, and self-efficacy is harder to obtain. Social persuasion can be accomplished through encouragement, support, positive comment, and other sources of

persuasion from superiors, colleagues at work, friends, or family for completing a task. This instills confidence and makes the person strive harder at more difficult tasks. Physiological and emotional states of a person can be viewed by others as positive or negative. A person who perceives another person negatively while performing a task may harbor the emotion of low self-efficacy for that task. If a person performing a task, and being observed, looks physiologically tense or moody, then the observer may avoid the same task for fear of the same tension and stress.

Bandura's (1986, 1997, 1999, 2001) studies have shown that self-efficacy is influenced by the social cognitive theory of behavior. This states that environmental situations, cognitive and personal factors, and demographic characteristics can influence an individual's behavior. He also stated that self-efficacy has a role in motivating the behavior of an individual. He further mentioned that individuals who are easily discouraged will fail; whereas, confident individuals who fall short of their goal will increase their efforts and persevere, resulting in attaining the goal.

Individuals' self-efficacy expectancies can vary with the task due to the magnitude, generality, and difficulty of the task to be accomplished. The magnitude of the task may be beyond the limits of the individual, thus causing anxiety. Some tasks require a minor mastery, causing an individual to falsely believe successes can come easily. This false belief causes individuals to become discouraged by failure when attempting a task they think is easy when in reality it is difficult. Setbacks in difficult efforts serve a useful purpose in teaching how to succeed by requiring sustained effort. Convincing individuals that they can succeed by persevering in the face of adversity enables them to rebound from setbacks. Perceived self-

efficacy has been shown to predict effective use of analytic strategies in managerial decision-making (Wood, Bandura, & Bailey, 1990).

Computer Self-Efficacy

Adapted from the self-efficacy concept, computer self-efficacy is the extent of an individual's perceived ability to use a computer. Delcourt and Kinzie (1993) defined computer self-efficacy as a measure of how confident computer users are with their ability to understand, use, and apply computer knowledge and skills. The authors found that individuals who have high computer self-efficacy will feel competent in using different computer hardware and software. However, a low computer self-efficacy leads to the belief that individuals will encounter difficulty in using computers hardware and software.

Ertmer, Addison, Lane, Ross and Woods (1999) suggested that educators with higher computer self-efficacy are likely to be more enthusiastic to use technology in their classrooms than those with lower levels of self-efficacy. They concluded that educators' personal beliefs with regard to their computer proficiency are the main factors in determining whether or not they will use computers in teaching and learning. The researchers also noted that many newly graduated teachers are more proficient at using computers than their more experienced colleagues. These skills, however, often could not be used because routine teaching obligations often hindered their efforts. Furthermore, a study by Czaja, Charness, Fisk, Hertzog, Nair, Rogers, and Sharit (2006) among 1,204 adults (men = 454, female =750) ranging in age from 18 to 91 years found that computer self-efficacy was an important predictor of general use of technology and that people with lower self-efficacy are less likely to use technology in general.

Measuring Computer Self-Efficacy

Similar to the computer anxiety scale, many instruments have been developed to measure computer self-efficacy. There are measurement tools developed by Hill, Smith, and Mann (1987), Murphy, Coover, and Owen (1989), Delcourt and Kinzie (l993), Busch (1995), Compeau and Higgins (1995), and Durndell, Haag, and Laithwaite (2000). Several computer self-efficacy measures were found in the literature, but no single measure is universally accepted.

The first computer self-efficacy scale was introduced by Murphy et al. (1989) with 32-items to measure an individual's perceptions of his capability regarding specific computer-related knowledge and skills. The instrument was administered to 414 individuals that included graduate students, adult vocational students, and professional nurses learning to use computers. The authors used the 5 point Likert-type format (1 = very little confidence to 5 = quite a lot of confidence), and participating respondents were asked to indicate the degree to which they felt. The authors performed factor analysis with an oblique rotation which produced three factors concerning computer skills (a) beginning level, (b) conceptual (advanced), and (c) mainframe. The reported Cronbach's alpha for the three empirically derived factors was .97, .96, and .92, respectively.

Harrison and Rainer (1992) replicated the factor structure found by Murphy et al. (1989) in their study to measure respondent perceptions regarding specific computer-related knowledge and skills. The instrument was administered to 693 university personnel who fully completed the survey. The participant group derived from four broad university job categories: (a) clerical, (b) technical, (c) faculty, and (d) administrative. The Cronbach's alpha coefficients for the three subscales on the computer self-efficacy skill scale were .97 on the beginning, .95 on the advanced, and .98 on the mainframe.

Torkzadeh and Koufteros (1994) used the 32-item scale with slight modification from Harrison and Rainer (1992). The authors removed two items from the original scale and opted to alter a Likert scale (1 = strongly disagree to 5 = strongly agree). The items removed were (a) using the computer to analyze number data, and (b) learning advanced skills within a specific program (software). The authors administered the instrument to 224 business undergraduates (male=125, female = 99) at a large state university in the midwest of the United States at the beginning and at the end of an introductory computer course. The authors examined factorial validity of this instrument with an oblique rotation and recommended a four-factor skill solution which was identified as (a) beginning, (b) mainframe, (c) advanced, and (d) file and software. The authors reported reliability for each factor as .94, .96, .90, .91 respectively.

Compeau and Higgins (1995) developed and tested a measure of computer self-efficacy, using a survey in an effort to understand the impact of self-efficacy on individual reactions to computer technology in business and industry. Bandura's (1997) social cognitive theory was employed to create a model for testing the effects of computer self-efficacy. The researchers' 10-item computer self-efficacy measure was designed to be task focused and to incorporate elements of task difficulty including computer use, anxiety, affect, outcome expectations, and organizational support, as well as encouragement by others. This survey was administered to 1,020 managers and professionals including insurance adjusters, financial analysts, researchers, consultants, and accountants. Their research concluded that computer self-efficacy influences individuals' use of the computer and learning to use computers, and empirically verified a strong link between self-efficacy and individual reactions to computing technology. They also found that computer self-efficacy exerted significant influence on (a) individuals' expectations of the outcomes of using computers, (b) emotional reactions to computers, and (c) their actual

computer use. In this research, the authors discovered that individuals with high self-efficacy used more computers, enjoyed using them, and experienced less computer-related anxiety.

Durndell et al. (2002) adopted a computer self-efficacy instrument that had been modified by Torkzadeh and Koufteros (1994) and made further changes to it in their study. The researchers removed all three statements that were related to mainframe as they reasoned that technology through the emphasis on stand alone machines has rendered these skills obsolete for most persons. The authors later added back the two statements that were originally used by Murphy et al. (1989) (a) using the computer to analyze number data, and (b) learning advanced skills within specific program (software). This instrument was translated into the Romanian language and was administered to 200 (male = 85, female = 115) students at a university in Romania at the end of the participants first academic year. A year later, the English version of Durndell et al. scale was administered to students in a university in Scotland under the same conditions and time of the academic year. A total of 148 students (male = 43, female = 105) participated in the study. In Scotland, the reported Cronbach's alpha coefficient was .96 and in Romania was 0.95. These alpha coefficients indicated that the instrument used was reliable.

There are many notable instruments used to measure computer self-efficacy. Lee and Bobko (1994) found that asking the respondents to rate their self-efficacy strengths and weaknesses were the most common measures of self-efficacy. Karsten and Roth (1998) recommended that researchers select the computer self-efficacy instrument whose items most closely reflect the skills they wish to measure and that the skills be clearly identified.

The Relationship between Computer Anxiety and Computer Self-Efficacy

The development of computer self-efficacy can be related to anxiety, whereby the lack of knowledge about computers can create a psychological fear, hence dampening the development

of confidence. Gardner, Render, Ruth, and Ross (1985) explained that this psychological fear related to working with computers includes (a) losing control, (b) losing one's job to a younger person if not successful in learning the computer skills, (c) breaking the computer or losing important information, and (d) embarrassment of not being able to learn the computer jargon.

Davis (1989) studied 152 computer users and found that perceived technology usefulness was positively associated with use and intention to use technology. In his study, perceived usefulness was significantly correlated with both self-predicted future usage (r = .85) and self-reported current usage (r = .63.). Igbaria and Parasuraman (1989) found that with respect to the anticipated relationships between attitude toward computer use and anxiety toward usage, attitude is negatively correlated with anxiety. Anxiety toward computer use is negatively correlated with computer skills, thus leading one to conclude that low anxiety toward computer use should be related to higher computer skills, and high anxiety with lower computer skills (Chu & Spires, 1991).

Recent research confirms the previous study. Compeau and Higgins (1995) discovered a relationship between self-efficacy and learning to use computers and software. Beliefs about capabilities to use technology successfully were strongly related to decisions about whether and how much to use technology. A survey on 406 microcomputer users in Finland revealed to Igbaria and Iivari (1995) that self-efficacy was positively correlated with perceived ease of use, perceived usefulness and usage, but negatively correlated with computer anxiety. They concluded that individuals with a high self-efficacy will interact with computers and be less anxious than a person with a low self-efficacy. If individuals believe they will have problems using a computer then they will avoid them due to this fear. Zhang and Espinoza (1998) stated

that computer-related self-efficacy influences a person's attitudes, perceptions, and beliefs about technology, and this relationship was clearly demonstrated in their study.

Summary

Self-efficacy is an important psychological construct that conveys an individual's level of confidence to execute courses of action in a given situation. This topic has been studied in depth by Bandura (1997) who found that self-efficacy is influenced by environmental situations, cognitive and personal factors as well as demographic characteristics. Computer self-efficacy is an extension of self-efficacy that is specifically related to computer usage. Delcourt and Kinzie (1993) characterized computer self-efficacy as a measure of confidence in a computer user to understand, use, and apply the computer skills and knowledge. There are several prominent instruments used to measure computer self-efficacy. Among the first computer self-efficacy measuring instrument developed was one by Murphy et al. (1989) and later used by other researchers such as Harrison and Rainer (1992), Torkzadeh and Koufteros (1994), and Durndell et al. (2000). Due to the technological advances, however, the original version of the instrument was modified to fit the researchers' needs to clearly identify and reflect the skills they wished to measure.

Computer Technology in Accounting

With the use of computers in the current business world, the application of computer software such as word processing, spreadsheets, databases, graphics, and telecommunications have become essential and integral to daily operations. Hogan (1994) believed that accounting is a natural subject for implementing computer usage applications. He also pointed out that word processing is one of the most commonly used software in the business world. Furthermore, he

believed that accounting students must know how to write and be encouraged to interpret financial data through written documentation.

Graham's (1993) study revealed that employers expect students to have a working knowledge of word processing packages. The author found that spreadsheet software has been identified as the number one software package desired by employers. According to Graham, accounting students need to have a working knowledge of accounting software since most business transactions are done with computers. Subsequently, in her research with certified public accountants (CPA) firms in Texas, Burnett (2003) found that the top four technology skills that potential employees must possess, in the order of importance, were spreadsheet, Windows, word processing, and World-Wide-Web.

McNulty (1995) argued that students could focus on analyzing and interpreting results instead of spending their time manually posting journal entries and preparing financial statements when those could be posted automatically to the ledger accounts via computers. He stated that there are software packages available in the market which help generate periodic trial balances and financial reports. Moreover, Geisert, and Futrell (1995) stated simulations are important in accounting to forecast real-world outcomes. They also believed such simulations could be a valuable tool for developing higher-order thinking skills. Therefore, Schmidt and Kirby (1995) concluded that teachers need to accentuate the concepts behind the software, thus helping to ease the transfer of learning.

The computer resource usage instrument contains a list of computer-related resources commonly used in educational settings. This instrument was administered by Miller (1997) to 282 educators in vocational program areas in the United States. The objectives of the study were to determine the levels of computer integration and differences in computer resource usage

among vocational teachers. The instrument consists of 18 selected computer applications using four point Likert scale (1=never, 2=sometimes, 3=often, and 4=quite often). Miller placed the computer applications into five different categories: (a) productivity software (word processing, spreadsheet, database management, and integrated software), (b) graphic applications (graphics, presentation, and desktop publishing software), (c) interactive technologies (authoring software, multimedia, and CD-ROM), (d) telecommunications resources (Internet, electronic mail, commercial on-line services, and electronic bulletin boards), and (e) computer-assisted instruction (simulations and games, drill and practice, tutorials, and discipline-specific programs). Miller reported an overall reliability alpha coefficient of .82. The reported reliabilities of productivity software, graphics applications, interactive technologies, telecommunications resource, and computer-assisted instruction subparts were .81, .83, .70, 83, and .83 respectively.

Demographic Variables

Research has shown that individual characteristics and general attitudes may influence the formation of attitudes toward computers specifically. Those characteristics and variables include (a) location, (b) gender, (c) age, (d) professional ranking, (e) levels of education, (f) teaching experience, (g) computer experience, and (h) types of computer training.

Location

Location may affect access to technology, and therefore on an individual's computer anxiety and computer self-efficacy. An individual's location may be a barrier to access technological and computer resources as well as books and experts. While perhaps less true in the United States, location does pose a problem for the Malaysian society since most computer dealers and bookstores are located in major cities. Hedney (1998) stated that one of the most important factors to increase computer skills among educators is to provide them with unlimited

access to computers and resources. He believed that educators need the opportunities to play, experiment, and make mistakes in private. Zakaria (2001) noted that 69% of the Malaysian respondents in his study experienced barriers in the use of computers due to the limited accessibility to the technology.

To further support this argument, Redmann, Kotrlik, Harrison, and Handley (1999) discovered that 89% of 56 business educators listed in the Louisiana Marketing Education Teachers Directory received information technology skills through self-directed training. In order for the educators to be motivated to explore computer programs and technology through using this method, they had to be able to access resources easily, but location could be a barrier to their efforts. This was due to the fact that not all of the 11 branches of UiTM were located close to a major city where respondents could access the computer resources outside the campus, or buy computer manuals from bookstores, or ask a qualified technician questions with regard to their self-training.

Gender

There are numerous studies dealing with gender and computer anxiety and computer self-efficacy. Results of these studies, however, have been inconsistent and research findings are inconclusive with regards to the effect of gender on this phenomenon.

A study by Gilroy and Desai (1985) of 136 male and 190 female participants revealed a difference in computer anxiety between genders. In their study, the female respondents exhibited more anxiety than males. Similarly, the study by Dambrot, Malek, Siling, Marshall, and Garver (1985) included 599 female and 342 male volunteers from an introductory psychology course, and they found that females had more anxiety and negative attitudes towards computers, had less mathematical proficiency, and scored lower than males on computer aptitude tests. The different

survey conducted in 21 countries by Reinen and Plomp (1993) revealed that computer usage at school was dominated by male participants. Dyck and Smither (1996) carried out a similar study and concluded that gender does have some influence on computer apprehension and attitudes. Their research revealed that female participants showed higher anxiety, less liking, less confidence, and less positive attitude toward computers than their male counterparts.

Durndell et al. (2000) found that in general, male participants had higher computer self efficacy than females, and that this was more so with advanced as opposed to beginning skills. Chou (2001) proposed the concept of gender as a variable that moderates the effects of training methods and computer attitudes. As a result, he hypothesized that male respondents will generally score higher on computer learning performance measures and score lower on computer anxiety measures. Cassidy and Eachus (2002) revealed similar results in their study on computer self-efficacy. Their study also showed that male participants had significantly higher computer self-efficacy as compared to their female counterparts. Czaja et al. (2006) also mentioned that women have higher computer anxiety, lower computer self-efficacy, and lower general computer attitudes.

Other studies, however, have shown that there is no significant difference between genders related to computer anxiety. A study conducted by Howard and Smith (1986) of 111 managers revealed that gender was not a significant factor in computer anxiety. Research by Igbaria and Parasuraman (1989) studied a population of 166 managers that included 115 males and 51 females and found no significant correlation between gender and computer anxiety. Ray and Minch's (1990) study of 114 business professionals that included 68 males and 46 females also showed that there are no significant differences between genders pertaining to computer anxiety.

In conclusion, a majority of the studies revealed that women had higher computer anxiety than their male counterparts. Those studies also noted that male respondents have higher computer self-efficacy than women.

Age

The age factor has been used to determine the extent of exposure that students had to computer usage while in college. Younger adults who went through college in the latter part of the 20th century tended to have been more exposed to technology while they were pursuing their education and did not dislike working with computers.

An extensive study with a sample of population of 422 participants consisting of senior citizens and college undergraduates by Dyck and Smither (1994) revealed a significant relationship between age and levels of computer anxiety. The significance is probably due to the presence of a wide age gap between the senior citizens and the college undergraduates.

Ellis and Allaire's (1999) research revealed similar findings to those of a study by Czaja et al. (2006) in which older and middle-aged adults had lower self-efficacy with respect to use of computers and higher computer anxiety than did younger adults. In their study, 90% of the middle-aged (18-39 years old) and 84% older people (60-91 years old) in their sample reported having experience with computers and that several prior studies had shown that experience with computers generally results in low anxiety and higher self-efficacy. Kelley and Charness (1995) also hypothesized the effect of age on computer performance due to age-related deficiencies, thus causing the need for more time to accomplish tasks. In his study, Maurer (2001) discovered that older participants reported lower self-efficacy for career-related training, revealing age-related declines for specific efficacies. This conclusion is similar to those of Jay and Willis (1992), Czaja and Sharit (1998), and Campbell (2004).

Others researchers, however, argued that this relationship remains inconclusive and may not exhibit sufficient strength (Chua et al., 1999). Many subsequent studies also revealed no relationship between the two variables since the connection between the two elements are not easily observed when the age range is narrow (Reed, Doty, & May, 2005). They also maintained that while prior studies have not extensively explored the negative relationship between age and computer self-efficacy, other variables need to be scrutinized to identify the cause of the said outcome.

Results from a recent survey by Czaja et al. (2006) suggested that in general computer users over the age of 65 had less confidence in their ability to use computers than did younger people and had fewer computer skills. This was partly due to their inability to adapt and use technology, thus placing them at a disadvantage in terms of their ability to successfully perform daily tasks. The study also suggested that people who were younger had higher levels of fluid intelligence and education, had lower levels of anxiety about computers, and were more likely to have experience with computers. These researchers also discovered that the older adult group of men and women (ages between 60 to 91 years old) had more computer anxiety and lower computer self-efficacy as compared to the younger group. The middle-aged adult group (ages between 40 and 59 years old) was also significantly different on these constructs than was the younger adult group (ages between 18 to 39 years old). In their study, the older adults seemed to have less interest in computers than other groups. Another general revelation was that women were reported as having higher computer anxiety, lower computer self-efficacy, lower general computer attitudes, and less interest in computers than their male counterparts. Their findings also indicated that computer self-efficacy was an important predictor of general use of technology and that people with lower self-efficacy were less likely to use technology in general.

Although there is an increase in the use of computers and technology in the general population, there are studies that indicate older adult groups as having more problems than younger people in learning to use and operate current technologies (Charness, Schumann, & Boritz, 1992; Rogers, Fisk, Mead, Walker, & Cabrera, 1996; Czaja and Sharit, 1999; Czaja, Sharit, Ownby, Roth, & Nair, 2001; Sharit, Czaja, Nair, & Lee, 2003). These conclusions are similar to the argument that people with lower self-efficacy display less enthusiasm to engage in a task than do those with higher self-efficacy.

Academic Rank

This is also an important factor to consider when determining the relationship between the demographic factors and computer anxiety and computer self-efficacy. The academic rank allows categorizing teaching experience as well as exposure to computer usage. Brown (2001) stated that business educators use computers to help them deliver their instruction, manage the course, and perform administrative tasks. Oscarson's (1976) study revealed that faculty members who had been in their positions for a longer period tended to be less interested in adopting the new technology. This finding was further supported by Adams (2002) who discovered that faculty with between 10 to 19 years of experience had the least integration of technology in their teaching.

Levels of Education

Igbaria and Parasuraman (1989) reported education as having a negative relationship to computer anxiety, but a positive association with computer attitudes. Moreover, Howard and Smith (1986) found that the lack of education and knowledge of computers could cause operational fears about using computers and computer software. The study found that an increase in education decreased computer anxiety and fostered a feeling of self-efficacy. Furthermore,

McQueen and Mill (1998) stated that the educational level had a positive effect on computer self-efficacy, so workers with greater levels of education and training had more confidence in their competencies for the use of computers and technologies.

Teaching Experience

Since the use of computers had only been emphasized toward the end of the twentieth century, Fletcher and Deeds (1994) concluded that teachers with 10 years of service or more needed training that was different from teachers who have less than 10 years of service. This was because teachers with less than 10 years of service had some exposure to the use of computers while in college. The authors also maintained that teachers with 10 years or more of service should be given a beginner's course. Russell, Bebell, Dwyer, and Connor (2003) found that teachers with 5 or less years of experience were significantly more confident using computers and technology than teachers who entered the profession (a) 6 to 15 years before, or (b) more than 15 years before. This indicated that there was a positive relationship between computer anxiety and teaching experience.

Computer Experience

Computer experiences have been associated with computer self-efficacy and computer anxiety (Igbaria & Iivari, 1995). Bradley and Russell (1997) and Rosen and Weil (1995) defined computer courses as part of computer experiences but excluded computer exposure or short-term computer courses. Chua and Chen (1997), who conducted a meta-analysis of studies of computer anxiety, concluded that the correlation between computer anxiety and prior computer experience was the "most consistent findings" (p. 825). Of 40 studies they reviewed, 36 of them indicated that an increase in computer experience generally reduced computer anxiety. Here, a positive correlation is expected because additional experience and exposure with computers means

having spent more time working with computers, thus increasing the computer self-efficacy and reducing the computer anxiety. However, the time spent working on a computer should be pleasant; otherwise, it can produce the opposite effect (Bradley & Russell, 1997).

Many research findings showed that computer anxiety can be significantly reduced by exposing people to computers, but much of it depends on the type of exposure (Chua et al., 1999). These researchers further hypothesized that studies should not focus only on the exposure to computers, but also on the type and quality of training. Bozionelos (2001) theorized that the magnitude of the relationship between scores on computer anxiety and scores on computer experience attenuated as scores on computer experience increased and scores on computer anxiety decreased. The study revealed that when individuals gained more experienced with computers, they were less likely to be anxious when dealing with technology.

In a research conducted with a sample of 133 undergraduates by Hill et al. (1987), the researchers disclosed a significant positive correlation between previous computer experience and computer self-efficacy. There have been several approaches to assess computer experience, and self-reported computer experience questionnaires are usually used to quantify computer experience. Gardner, Dukes, and Discenza (1993) used frequency of computer use to indicate computer experience. To determine frequency of use, Gardner et al. asked participants to check when computers were used in the course of a day. Chua et al. (1999) believed that measures of the amount of computer experience might include the number of (a) computer courses previously attended, (b) the years using computers, and (c) computer course hours, as well as (d) the frequency of use of computers at work or at home.

Computer Training

Igbaria and Iivari's (1995) study showed that training had to include the application of technology to actual work situations. They believed such training would increase a person's confidence and ability to master a task when using a computer. Further, Wang, Ertmer, and Newby's (2004) research revealed that pre-service teachers who were exposed to vicarious learning experiences in computer training and who were assigned specific goals experienced significantly greater increases in judgments of computer self-efficacy than those who received only one of these two conditions.

Summary

As demonstrated by the literature, computer self-efficacy and computer anxiety are strong predictors to an individual's level of confidence when working with computers. Literature reviews have provided evidence that educator's computer anxiety and computer self-efficacy are important key factors to study and to provide useful information to understand the personal motivation as well as the barriers to integrate the usage of computers in classrooms. It was noted that employers' expectations in the potential employees included having sufficient computer skills when applying for a job, especially in the accounting practice.

The literature review further explored the relationship between computer anxiety and demographic variables such as gender, age, academic rank, teaching experience, computer experience, and computer training, which revealed some interesting discoveries. While there are general consistencies in many of the findings, it should be noted that researchers have not been conclusive in regards to the relationship between computer anxiety and gender. Some studies revealed a positive relationship between computer anxiety and gender, but others revealed no

significant differences. It is hoped that this dissertation will shed some light in regards to the inconclusiveness of such earlier studies.

In addition, it is also hoped that this study will serve as a foundation for other technological studies in Malaysia to further understand factors that may influence integration of technology among educators. This concern affects not only higher education institutions, but also primary and secondary establishments. It is also hoped that this study will open a new frontier to achieve the Malaysian government's objective to be a fully developed country by the year 2020 and to provide a technologically skilled and qualified workforce.

Chapter 3

Methodology

This chapter describes the methods used to answer the research questions. It specifically focuses on population, instruments, a pilot study, data collection procedures, study variables, and data analysis. The purpose of this study was to determine the effect a set of selected variables and factors had upon the level of computer anxiety, and the extent of computer applications usage by members of the faculty of accountancy at Universiti Teknologi MARA (UiTM). Computer self-efficacy, computer applications usage, and several selected characteristic variables were used to predict the level of computer anxiety among accounting faculty members. As discussed in Chapter 2, the instrument had been used in several settings and conditions, but it has not been tested in Malaysia, especially among accounting educators. The reliabilities of the sub-scales in the instrument are reported in the findings.

A survey instrument was administered to accounting faculty at UiTM, Malaysia. The data gathered by the instrument was used to answer the following research questions:

1. What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based upon gender and age categories?
2. To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, hours of formal computer training, years of computer experience, years of computer use in instruction, and location)?

3. To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based upon the same selected characteristics?

Population

UiTM is the largest college in Malaysia with over 50,000 students enrolled in various fields. Currently, there are 12 UiTM branches throughout Malaysia, but only eleven of them offer an accounting program to the students at various level such as diploma, bachelor's, master's, and doctoral degree. There were 368 full-time accounting faculty teaching at these branches in the 2006/2007 academic year and all were included in this study. This figure was obtained from the accounting program leader from each branch, and the dean, Faculty of Accountancy, UiTM, Shah Alam, Malaysia. A total of 368 survey materials were distributed to accounting faculty members at UiTM branches as shown in Table 1.

Table 1

Number of Survey Materials Distributed to Faculty According to Branch

	Branch Campus	Male	Female	Total
1.	Perlis (RA)	13	20	33
2.	Kedah (KE)	2	12	14
3.	Perak(AA)	6	23	29
4.	Shah Alam (BE)	25	88	113
5.	Melaka (MK)	9	22	31
6.	Johor(JH)	10	24	34
7.	Pahang (CA)	8	14	22
8.	Terengganu (TG)	9	23	32
9.	Kelantan (DN)	9	18	27
10.	Sarawak (QK)	6	17	23
11.	Sabah (SA)	4	6	10
	Total	101	267	368

Instruments

A four-part instrument was used in this study. It addressed (a) computer anxiety, (b) computer self-efficacy, (c) computer applications usage, and (d) general information. The first section consisted of 18 items to measure computer anxiety, and the second of 29 items to measure computer self-efficacy. The third consisted of 10 selected types of computer applications software to ascertain the frequency of usage, while the last section gathered general information regarding participant's gender, age, academic rank, levels of education, and number of years of teaching experience. This section also solicited participant's information pertaining to computer usage that included primary source of computer training, the number of hours spent on formal computer training within the previous five years, years of computer experience, and years of computer applications usage either as a tool to support instruction or taught to students as part of the curriculum in the courses they took during an academic year.

Computer Anxiety Rating Scale

The 18 statements of Part 1 measured faculty computer anxiety using a slightly modified version of the Computer Anxiety Rating Scale (CARS) developed by Hienssen, Glass and Knight (1987). Three modifications were made to the original version of the instrument: (a) modifying the original Likert scale, (b) deleting one item from the original version, and (c) rewording some of the terminology. A modified Likert-type scale (1=strongly disagree to 4=strongly agree) was adapted for the instrument. Heinssen et al. used a five-point Likert scale (1=strongly disagree to 5=strongly agree) that included a neutral response (3=neither agree nor disagree). The original version of the instrument had 19 items; however, the researcher decided that the item number 9 of the original version, "I am sure that with time and practice I will be as comfortable working with computers as I am in working with a typewriter," is no longer

applicable since typewriters are no longer being used in most offices. The removal of this item left the instrument with 18 statements of which eight were positively and ten were negatively worded. The third modification was the changing of the word “hitting the key” to “pressing the key,” which is item number 13 in the modified instrument. All positively worded CARS response items (8 items) were reversed prior to analysis so that the higher scores on all items indicated a higher level of anxiety. The reliability of this sub-scale was reported in the findings section.

Computer Self-Efficacy Scale

Part II of the instrument consisted of a series of items designed to measure faculty computer self-efficacy. This 29-item section was based on the Durndell, Haag, and Laithwaite (2000) research with slight modifications. The first modification was related to the original Likert scale, and the second was some rewording related to terminology. The Likert scale format (1=strongly disagree to 4=strongly agree) was used to conduct this research. The Durndell et al. instrument had a five-point scale (1=strongly disagree to 5=strongly agree) that included a neutral response. It was felt that some participants might choose a safe response by selecting the neutral one; hence, the Likert scale was reduced to just four options so that respondents had to make a choice. Some of the items in the instrument were reworded for clarity and to be in accordance to the current computer terminology. For example, item number 6 in the original version; “Calling up a data file to view on the monitor screen” was reworded as “Retrieving a data file to view on the monitor screen.” Findings on the reliability of the sub-scale were reported in the findings section.

Computer Applications Usage

The computer applications usage instrument (CAU) contained a list of computer applications commonly used in higher educational institution settings. This scale was used by Miller (1997) to determine the differences within commonly used computer-related resources among vocational educators in various vocational programs nationwide.

For this study, a modified version of the original Miller (1997) Computer Resource Usage Scale was used. The modifications were the elimination of the graphic applications and interactive technologies categories since these were neither emphasized by the AICPA (1999) nor commonly used in accounting practices. The Likert scale was modified from a 5-point scale format (1 = strongly disagree to 5 = strongly agree) to five points (0 = not available, 1 = strongly disagree to 4 = strongly agree).

Pilot Study

In the pilot test, questionnaires were distributed to faculty members at UiTM in Shah Alam (*n*=5), Melaka (*n*=3), and Sarawak (*n*=2), and doctoral candidates at Virginia Polytechnic Institute and State University (Virginia Tech) (*n*=4). The questionnaires to faculty were distributed electronically, and to doctoral candidates at Virginia Tech, by hand, using a paper version. The objectives of the pilot test were to (a) determine if the English language used in the survey instrument could be easily understood, (b) identify any ambiguities within the questionnaire, (c) determine if there were any problems that the participants might encounter, (d) estimate the time to complete the survey, and (e) solicit comments and suggestions.

The pilot study helped to identify questions that were unclear or confusing to the participants, as well as items that participants had difficulty with or refused to answer. Participants were given the opportunity to make constructive suggestions or comments regarding

the instrument. The pilot testing also provided the researcher with an opportunity to correct errors and reword questions for clarity. A standardized cover letter (Appendix A) to explain the purpose of the pilot study was included with the survey instrument. Participants took between 8 and 20 minutes to complete the survey. They did not report having difficulties responding to the questions, and none of them provided any suggestions to rewrite any items in the questionnaire. The overall reliability coefficient of the total instrument was .83 while the coefficients for the sub-scales, CARS, CSE, and CAU were .74, .94, and .69 respectively. Consequently, the survey instrument was finalized and used to conduct this research (Appendix B).

Data Collection Procedures

Prior to the implementation of the survey, the researcher applied for the Certification of Exemption of Projects Involving Human Subjects from the Virginia Polytechnic Institute and the State University Institutional Review Board for Research Involving Human Subjects (Appendix C). After it had been approved, the researcher sent survey packets and instructions to each branch's research coordinator. These contained the instrument in envelopes that were addressed to each full-time faculty member, an instruction letter (Appendix D), a non-respondent summary form (Appendix E), a list of the faculty members in the branch, and a timeline schedule.

The researcher adopted Fowler's (2002) strategies to maximize the response rate from the participants. A collegiate cover letter (Appendix F) to explain the purpose of the survey was included with the survey instrument. The letter assured the participants' confidentiality, and emphasized that the only person allowed to keep and analyze the data in its original form was the researcher. Participants were allowed to withdraw from the study without penalty. The e-mail addresses of both the researcher and the researcher's academic advisor were provided in the cover letter in the event that the participants needed to communicate for further information or

clarifications. Labeled return envelopes for responses to the researcher were also supplied to favor prompt returns of the questionnaire. The questionnaire was designed to take15 minutes to complete which would increase the likelihood of response. Follow-up letters were sent to those individuals who had not responded after two weeks

The branch research coordinator personally distributed the questionnaires within seven days of receipt. A five-digit identification code consisting of two letters and three numbers was assigned to each questionnaire. The two letters identified the branch, while the numbers identified the subject. The code was printed on the top left-hand corner of each page of the questionnaire and on the return envelope. The research coordinator of each branch assigned an identification code to each participant without the knowledge of the researcher. The participants' name with the assigned identification code was kept by the coordinator for tracking purposes. This measure allowed the research coordinators to identify those who had responded and those who needed to be contacted in an effort to have the questionnaires returned. Research coordinators were reminded to neither imply nor suggest to the participants that they were expected or required to complete the survey. The respondents returned the completed questionnaire in a sealed envelope addressed directly to the researcher through the research coordinator. A thank-you card was sent to respondents by the research coordinator immediately after they had returned the questionnaire. Table 2 shows the timeline of the survey research activities conducted by the research coordinators at each branch.

Table 2

Timeline for the Implementation of the Survey Conducted By Research Coordinators

Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Questionnaire package received							
Questionnaire distributed							
First reminder sent							
Second reminder sent							
Data collection stopped							
Responses mailed to researcher							

The research coordinators were instructed to send the first reminder letter (Appendix G) with a copy of all survey materials to all participants who failed to respond in week four based on the schedule kept by the coordinator. In week five, a second reminder letter (Appendix H) without survey materials was sent to participants who failed to comply with the first reminder letter, stressing the importance of response and asking them to return the survey materials within a week after the receipt of the reminder.

At the end of week six, the research coordinators stopped all data collection efforts. Participants who did not return the survey materials during that period were categorized as non-respondents. The research coordinators completed the summary of the non-respondents form and sent it to the researcher with the completed questionnaires in a sealed envelope in week seven. Later, the research coordinator destroyed the list containing the respondents' names and their assigned numbers. The non-respondents' summary was used to analyze whether there were any systematic patterns between those who did not respond and those who responded, based on gender and location. After all completed questionnaires were received by the researcher from each research coordinator; a thank-you card and a small token were sent to them for their assistance in administering the survey.

Study Variables

The operational definitions of the demographic variables in this research and how each was coded are discussed below. All categorical variables were coded into dummy variables to represent multi-category factors in multiple regression analysis. A dummy variable is a dichotomy coded as either a 0 or 1, with 0 representing non-membership in that category and 1 representing membership in a category being considered.

Gender

This variable is coded as female = 0 and male = 1.

Age

In this research, age was treated as a continuous variable when performing a multiple regression analysis. But in conducting analysis of variance (ANOVA), age was categorized as (a) younger adults; age range between 18 and 39, and (b) middle-age adults; age range between 40 and 59, based on a study by Czaja, Charness, Fisk, Hertzog, Nair, Rogers and Sharit (2006) to answer research question one. The category of younger adults was coded as 0 and middle-aged adults as 1. Older adults, age between 60 and 91 years old were not included in this study because the faculty in Malaysia retires at the age of 56.

Location

The location factor was pre-determined by the researcher without the respondent's knowledge. There were two distinct categories of location used in this research, and the researcher assigned each branch into one of these. Not all UiTM branches throughout Malaysia were located close to major cities that offer bookstores and libraries with a large selection of computer books and resources as well as computer stores with qualified technicians. Based on the researcher's knowledge about the locations of each branch, the three major cities were

identified as having an abundance of computer resources, and they are Penang, Kuala Lumpur, and Johor Bahru. Branches that are located within 2 driving hours from the three cities were classified as being in urban areas, while others were automatically categorized as rural areas. The branches classifications were coded into dummy variables; the branches in urban areas were coded as 0, and those in rural area were coded as 1 as shown in Table 3.

Table 3

Classification of UiTM Branches

No.	Branch Campus	Classification	Code
1.	Perlis (RA)	Urban	0
2.	Kedah (KE)	Urban	0
3.	Perak(AA)	Urban	0
4.	Shah Alam (BE)	Urban	0
5.	Melaka (MK)	Urban	0
6.	Johor(JH)	Urban	0
7.	Pahang (CA)	Rural	1
8.	Terengganu (TG)	Rural	1
9.	Kelantan (DN)	Rural	1
10.	Sarawak (QK)	Rural	1
11.	Sabah (SA)	Rural	1

Academic Rank

There are five categories of academic rank in the faculty. They range from junior lecturer to professor, based on seniority and promotions. The categories of the academic ranking are:

1. Junior Lecturer, a faculty member with only a bachelor's degree or accounting professional certification qualification.
2. Lecturer, a faculty member who possesses a master's degree.
3. Senior Lecturer, a faculty member who has been promoted from lecturer based on his or her experiences and contributions to the university.

4 Associate Professor, a faculty member who has been promoted from senior lecturer based on his or her experiences and contributions to the university.

5. Professor, a faculty member who has been promoted from associate professor based on his or her experiences and contributions to the university.

In multiple regression, in order to determine the number of dummy variables, the formula (*k*-1) was used, where *k* represents the number categories in the variable (Pedhazur & Schmelkin, 1991). Since there were five categories of academic rank, the required number of dummy variables was four (*5*-1). The omitted dummy variable corresponded to the reference category; in this case, the professor category was determined to be the reference category or the control variable. The researcher used dummy variables by assigning the value 0 and 1 to differentiate these five categories. Let: X_1 represent "Is the subject a junior lecturer?" (1 = Yes; all others were coded as 0), X_2 represent "Is the subject a lecturer?" (1 = Yes; all others were coded as 0), X_3 represent "Is the subject is a senior lecturer?" (1 = Yes; all others were coded as 0), X_4 represent "Is the subject an associate professor?" (1 = Yes; all others were coded as 0). The fifth dummy variable (X_5) that represents "Is the subject a professor?" (1 = Yes; all others were coded as 0) was not needed in order to avoid multi-collinearity issues.

The pair of values (X_1, X_2, X_3, and X_4) is the difference for each categories of subject, so one could tell five groups apart using four dummy variables. The formula for determining X_5 = [1-(X_1 + X_2 + X_3 + X_4)]. Since X_5 is dependent on X_1, X_2, X_3, and X_4 variables, it was considered to be redundant, and if all five dummy variables were used in a regression, the analyses would fail to run because the five variables were totally multi-collinear. Table 4 shows the variables that were coded with T as a subject and X as the dummy categories.

Table 4

Dummy Variables for Academic Ranks Categories

Subject	Categories	T	X_1	X_2	X_3	X_4	X_1,X_2,X_3,X_4 Pair
Mr. A	Junior Lecturer	1	1	0	0	0	1,0,0,0
Miss B	Lecturer	2	0	1	0	0	0,1,0,0
Mrs. C	Senior Lecturer	3	0	0	1	0	0,0,1,0
Mr. D	Associate Professor	4	0	0	0	1	0,0,0,1
Mrs. E	Professor	5	0	0	0	0	0,0,0,0

Note: T is the subject, and X_1, X_2, X_3, and X_4 are the dummy variables.

In this study, the academic rank of professor was not coded to allow the researcher to determine if being a junior lecturer, lecturer, senior lecturer or associate professor predicts a different computer anxiety level than being a professor. Consequently, if the variable, "junior lecturer" was significant in the regression analysis, with a positive beta coefficient, this would mean that junior lecturers were significantly more anxious than professors.

Levels of Education

There are four types of degrees held by faculty members teaching at UiTM. They range from a bachelor's degree (a four-year college education) up to a doctoral degree. There are also faculty members with an accounting professional degree earned from professional bodies such as the Association of Certified Chartered Accountants, United Kingdom (ACCA, UK), the Chartered Institute of Management Accountants, United Kingdom (CIMA, UK), the Malaysian Institute of Certified Public Accountants (MICPA), the Institute of Chartered Secretaries and Administrators (ICSA), and Certified Practicing Accountants (CPA), Australia. The accounting professional degree is recognized by the Malaysian government as equivalent to a bachelor's degree. The classifications of the academic qualification are as follows:

a. Professional degree (e.g. ACCA, CIMA, MICPA, ICSA),

b. Bachelor's degree,

c. Master's degree, and

d. Doctoral degree.

The procedures of determining the numbers of dummy variables and assigning the value 0 and 1 for this category are similar to the one discussed in the previous section. The doctoral degree was chosen as the reference category. Table 5 displays the four categories of education level that were coded into three dummy variables.

Table 5

Dummy Variables for Levels of Education Categories

Subject	Categories	T	Y_1	Y_2	Y_3	$Y_1 Y_2 Y_3$ Pair
Mr. A	Bachelor's degree	1	1	0	0	1,0,0,0
Miss B	Professional degree	2	0	1	0	0,1,0,0
Mrs. C	Master's degree	3	0	0	1	0,0,1,0
Mr. D	Doctoral degree	4	0	0	0	0,0,0,0

Note: T is the subject, and Y_1, Y_2, and Y_3, are the dummy variables.

Primary Source of Training

Participants reported the primary source of their computer training as either self-taught or formal training. Self-taught is defined as the participants' using new software and exploring the functions and practicality in an informal setting. They may ask questions to their friends or read the manuals without enrolling in any computer classes. Formal training, on the other hand, consists of seminars, computer classes, and workshops, held either in UiTM or outside. This variable is coded as self-taught = 0 and attended formal training = 1.

Years of Teaching Experience

In this study, years of teaching experience, hours of attended formal training, years of computer experience, and years of using computers in accounting instruction were treated as continuous variables.

Data Analysis

Several statistical techniques were used to analyze the data. Descriptive statistics, cross-tabulation, and frequencies were employed to describe the population in terms of the demographic variables: gender, age, level of education, academic rank, location, and training. ANOVA was used to determine if there were significant mean differences between subgroups based upon gender and age categories related to computer anxiety and computer self-efficacy. Stepwise multiple regression analysis was used to predict computer anxiety as a dependent variable, and the independent variables consisted of computer self-efficacy, computer applications usage, and all demographic information variables. An alpha level of .10 was used to test for significance since this was an exploratory study.

Research Question 1

What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based upon gender and age categories?

In determining the levels of computer anxiety, the question was answered by analyzing the total composite computer anxiety scores. The scores were computed using all 18 questions with the four-point Likert scale (1=strongly disagree to 4=strongly agree). All positively worded statements (8 items) of CARS were reverse scored prior to analysis so that the higher scores on all items indicated a higher level of computer anxiety. The possible total composite CARS scores

ranged from 18 (indicating a low level of computer anxiety) to 72 (indicating a high level of computer anxiety). Oetting (1983) categorized degree of anxiety level into (a) very relaxed/confident, (b) generally relaxed/comfortable, (c) mild anxiety, (d) anxious/tense; and (e) very anxious. This study used the Oetting levels to separate scores as follows. Those ranging between (a) 18-28, were very relaxed; (b) 29-39, generally relaxed; (c) 40-50, mildly anxious; (c) 51-61, anxious; and (d) 62-72, very anxious.

Frequencies, means, and standard deviations of respondents were computed on the overall computer anxiety scores. Cross-tabulations were also computed between the total CARS score for gender, age categories, academic rank, levels of education, teaching experience, years using computers, years of using computers in instruction, and location. A two-way ANOVA was conducted using the mean total computer anxiety scores of the subgroups defined by gender and age categories to determine whether significance differences existed between the two subgroups and the interaction between age categories and gender.

As for the levels of computer self-efficacy, the question was answered by analyzing the total composite self-efficacy scores. The possible total composite CSE scores ranged from 29 to 116 using all 29 questions with a four-point rating scale (1=strongly disagree to 4=strongly agree). The degree of confidence was sorted into 4 categories (a) scores ranging between 29-50 were categorized as not confident, (b) 51–72 as little confidence, (c) 73-94 as confident, and (d) 95-116 as very confident on the computer self-efficacy scale.

High scores indicate respondents' high levels of self-efficacy in using computers and vice-versa. Descriptive statistics, frequencies, means, and standard deviations, were used to describe respondents that fell into each of the four categories. A cross-tabulation was performed between total composite CSE scores with gender, age, academic rank, levels of education,

teaching experience, number of years using computers, number of years using computers in instruction, and location. A two-way ANOVA was conducted using the mean total computer self-efficacy scores of the sub-groups defined by gender and age to determine whether an interaction existed between gender and age categories.

Research Question 2

To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, years of computer experience, years of computer use in instruction, and location)?

The Pearson's product-moment correlation coefficient (*r*) was used to measure how well a linear equation describes the relationship between computer anxiety, computer self-efficacy, computer applications usage, and selected characteristics. Hinkle, Wiersma, and Jurs (1998) have suggested the range of the full scale of interpretation of correlation coefficients in determining the directions and strengths of the relationship between variables. Table 6 shows the guidelines for interpreting correlation coefficient.

Table 6

Interpretation of Correlation Coefficient

Range of Positive Coefficient	Type of relationship	Range of negative Coefficient
.90 to 1.00	Very high positive (negative) correlation	-.90 to -1.00
.70 to .90	High positive (negative) correlation	-.70 to -.90
.50 to .70	Moderate positive (negative) correlation	-.50 to -.70
.30 to .50	Low positive (negative) correlation	-.30 to -.50
.00 to .30	Little, if any correlation	.00 to -.30

Note. Guidelines for interpreting correlation coefficients (Hinkle, Wiersma, and Jurs, 1998, p. 105)

Stepwise multiple regression analysis was carried out to assess the relative contributions of computer-self efficacy, computer applications usage, and the selected characteristics to the explanations of computer anxiety. The independent variable that best correlated with the dependent variable was first included in the equation. Next, by controlling for the first independent variable, of the remaining independent variables, the one with the highest partial correlation with the dependent variable was entered. The processes were repeated, each time partialling for previously entered independent variables, until the addition of remaining independent variables did not increase R-square or until all variables were entered. The regression equation was:

$$Y_1 = a + \beta_1 R_1 + \beta_2 R_2 + \beta_3 R_3 + \beta_4 R_4 + \beta_5 R_5 + \beta_6 R_6 + \beta_7 R_7 + \beta_8 R_8 + \beta_9 R_9 + \beta_x R_x$$

where, Y_1 = computer anxiety

a = constant (intercept)

$\beta_1 \ldots\ldots \beta_x$ = regression coefficients

$R_1 \ldots\ldots R_x$ = independent variables

Research Question 3

To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based on the same selected characteristics?

The total composite computer application usage scores was computed using all 10 selected computer application categories or types with the five points Likert scale (0= not available, 1=never to 4=always). The possible scores ranged from 0 to 40. Higher scores indicated the most frequent use of computer applications. Descriptive statistics, frequencies, and cross-tabulation were used to determine the availability of the software and describe the levels of computer applications usage based on types of software, gender, and location.

Summary

This chapter outlines the methodology that was used in this research. There were discussions regarding the population, instruments, and the pilot study. A description of data collection procedures and the timeline of the implementation of the survey conducted by research coordinators, the selected characteristic variables, and the data analysis were also investigated.

In this study, a total of 368 survey materials were disseminated to accounting faculty members at 11 UiTM branches. The survey materials contained a four-part instrument which was used to obtain information on respondent's computer anxiety, computer self-efficacy, computer applications usage, and respondent's general information. The responses were mailed to the researcher by the research coordinator from each branch in week seven.

Once the data had been collected, the researcher coded all categorical variables as dummy variables to represent multi-category factors in multiple regression analysis. A dummy variable is a dichotomy coded as either a 0 or 1 variable. Statistical techniques such as descriptive statistics, ANOVA, and multiple regression analysis were adopted to analyze the data sets. An alpha level of .10 was used to test for significance. The findings obtained from the application of these methods are discussed in Chapter 4.

Chapter 4

Findings

This study investigated the levels of computer anxiety and computer self-efficacy among accounting educators and the extent to which they were using computer technology in instruction at Faculty of Accountancy, Universiti Teknologi MARA, (UiTM). The purpose of this chapter is to report the findings of the study. Where respondents failed to answer a question or gave an invalid response, the number of valid responses is indicated. Raw data are reported together with pertinent statistics. The first section of the findings presents the demographic characteristics of the respondents. The second section presents research findings as a result of this study for each of the following three research questions:

1. What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based upon gender and age categories?
2. To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, hours of formal computer training, years of computer experience, years of computer use in instruction, and location)?
3. To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based upon the same selected characteristics?

Survey Response

The survey instruments were distributed by research coordinators at each branch during the fourth week of December 2006 with a cover letter and a return envelope. A total of 368 sets of questionnaires were distributed to faculty of accountancy at 11 UiTM branches in Malaysia. Seventy-three percent (267) were distributed to female faculty, and 27% (101) were distributed to male faculty. The overall response rate was 71%, in that 262 respondents returned the questionnaires within the specified time, thus 29% (106) were considered as non-respondents.

The overall reliability coefficient of the instrument was .83 on the final study data. The Cronbach's alpha coefficients on the sub-scale instruments for computer anxiety, computer self-efficacy, and computer applications usage were .78, .95, and .78 respectively. This suggests that the survey instruments used in the pilot study were reliable for measuring accounting educators' levels of computer anxiety, computer self-efficacy and computer applications usage.

Sample Bias

In spite of the fact that the entire population was surveyed, 29% of the population decided not to participate in the study. The possibility of bias always existed due to these non-responses. To investigate this, the researcher performed the test of null hypothesis to determine whether the responding group was similar to the population distributions in terms of gender and location. These characteristics of the population were selected based upon findings of previous research and the availability of the information. Based upon the tests, no significant differences were found. Together with a high response rate (71%), this adds to the belief that the sample is representative of the population.

Characteristics of Respondents

The general information section in the survey instrument was used to gather information about the respondents' gender, age, academic rank, levels of education, teaching experience, primary source of computer training, years of computer experience, years of computer use in instruction, and location. This information was tabulated using frequencies, percentages, and cross-tabulation as discussed below. The discussion helped in the interpretation of the results.

Table 7 shows the summary of responses received based on several general characteristics such as gender, academic rank, levels of education, and location. Of 262 respondents, 71% were female and 29% (76) were male and held academic ranks from junior lecturer to professor. A majority of the respondents (57%) held academic rank as lecturers, 17% as senior lecturers, 16% were associate professors, and 1% professors. As for their levels of education, 86% of the respondents reported they held a master's degree, 6% indicated they had doctoral degree, and the remainder bachelor's degrees. Seventy-one percent (185) respondents were from urban areas and 29% (77) were from rural areas.

Table 8 displays the comparison between population, respondents, and non-respondents according to UiTM branches. Based on the number of questionnaires distributed to each branch, the highest response rates were from Sabah (100%), Sarawak (91%), and Melaka (90%). Kelantan and Terengganu had the lowest rate of response with 52% and 56% respectively.

Table 7

Summary of Survey Response Rate

	Respondents		Non-respondents		Population	
Variable	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Female (N= 267)	186	71%	81	76%	267	73%
Male (N= 101)	76	29%	25	24%	101	27%
Total	262	100%	106	100%	368	100%
Academic rank						
Junior lecturer	23	9%	2	2%	25	7%
Lecturer	151	57%	72	68%	223	61%
Senior lecturer	44	17%	10	9%	54	15%
Associate professor	42	16%	21	20%	63	17%
Professor	2	1%	1	1%	3	1%
Total	262	100%	106	100%	368	100%
Level of education						
Professional degree	1	<1%	0	0%	1	0%
Bachelor's degree	20	8%	2	2%	22	6%
Master's degree	225	86%	93	88%	318	86%
Doctoral degree	16	6%	11	10%	27	7%
Total	262	100%	106	100%	368	100%
Location						
Urban	185	71%	69	65%	254	69%
Rural	77	29%	37	35%	114	31%
Total	262	100%	106	100%	368	100%

Table 8

Response Rate by Branch

	Population	Respondents		Non-Respondents	
Branch	Frequency	Frequency	%	Frequency	%
Sabah	10	10	100%	0	0%
Sarawak	23	21	91%	2	9%
Melaka	31	28	90%	3	10%
Perak	29	25	86%	4	14%
Johor	34	26	76%	8	24%
Kedah	14	10	71%	4	29%
Shah Alam	113	75	66%	38	34%
Perlis	33	21	64%	12	36%
Pahang	22	14	64%	8	36%
Terengganu	32	18	56%	14	44%
Kelantan	27	14	52%	13	48%
Total	368	262	71%	106	29%

Table 9 presents the summary statistics between gender and age. The age of the respondents ranged from 25 to 55 years of age. The mean age for females was 37.8, mode 34, and the standard deviation was 6.6 years. As for male respondents, they were on average older than the females. The mean age was 40.9, median 40.5, mode 38, and the standard deviation was 7.6 years. The youngest age reported by a female and a male was 25 and 28 years respectively. Both the male and female groups included persons 55 years old, one year from reaching the mandated retirement age of 56. Appendix I provide the frequency of respondents by age.

Table 9

Age Summary Statistics by Gender

	Age Summary Statistics					
Gender	Mean	Median	Mode	Std. Deviation	Minimum	Maximum
Female	37.8	36.0	34	6.6	25	55
Male	40.9	40.5	38	7.6	28	55
Total	38.7	37.0	34	7.0	25	55

Female *N* = 186, Male *N*= 76

Based upon age, respondents were categorized into two groups; younger adults (18 to 39 years old), and middle-aged adults (40 to 59 years old). Table 10 shows the cross-tabulation of gender and location by age categories. Overall 58% of the respondents were categorized as younger adults and 42% were middle-aged adults. Of the female respondents, 63% were younger adults and 37% were middle-aged adults. Of the male respondents, 46% were younger adults and 54% were middle-aged adults.

As discussed in Chapter 3, the locations of 11 branches of UiTM were classified into two categories: rural and urban. Table 10 also shows the cross-tabulation between the location and age categories. In the location category, younger adults represented 66% of the population in rural areas as compared to only 55% in urban areas. There were 63% females in the younger adult group and 37% in middle-aged group. But as for the male group, 54% were in the middle-aged adults group, a higher percentage than females.

Table 10

Gender and Location Summary by Age Categories

	Age Categories		
Variable	Younger Adults	Middle-Aged Adults	Total
Gender			
Female	63% (117)	37% (69)	100% (186)
Male	46% (35)	54% (41)	100% (76)
Location			
Urban	55% (101)	45% (84)	100% (185)
Rural	66% (51)	34% (26)	100% (77)
Total	58% (152)	42% (110)	100% (262)

Table 11 presents the cross-tabulation between location and academic rank of the respondents. The urban areas had more respondents with higher academic rank; 21% associate professors and less than 1% professors as compared to rural with only 5% of the highest

academic rank being associate professors. Rural areas had more respondents holding current academic rank as junior lecturers, with 16% as compared to urban areas with 6%. A majority of the respondents in both locations were lecturers: 57% in urban and 58% in rural areas. The detailed breaks down of academic ranks according to branches are shown in Appendix J.

Table 11

Distribution of Academic Ranks by Location

	Academic Rank					Total
Location	Junior Lecturer	Lecturer	Senior Lecturer	Assoc. Professor	Professor	
Urban	6% (11)	57% (106)	15% (28)	21% (38)	1% (2)	100% (185)
Rural	16% (12)	58% (45)	21% (16)	5% (4)	0% (0)	100% (77)
Total	9% (23)	58% (151)	17% (44)	16% (42)	<1% (2)	100% (262)

Table 12 displays respondents' years of teaching experience at the university level, ranging from 1 to 31 years. Overall, the mean number of years of teaching experience was 11.3, with a standard deviation of 6.6 years. Male respondents on average had more teaching experience at the university level. As for the females, the mean and standard deviation of years of university teaching experience was 10.9 and 6.5 respectively. The detailed frequency of respondents' years of teaching experience at the university is provided in Appendix K.

Table 12

Years of Teaching Experience Summary Statistics by Gender

	Years of Teaching Experience Summary Statistics					
Gender	Mean	Median	Mode	Std. Deviation	Minimum	Maximum
Female	10.9	10	10	6.5	1	31
Male	12.2	11	20	6.8	1	31
Overall	11.3	10	10	6.6	1	31

Female N = 186, Male N= 76

Thirty-five percent (91) of the respondents reported formal training as their primary source of computer training, while 65% (171) reported self-training. Furthermore, the finding revealed that in the self-training group, nine percent (16) of the respondents reported that their primary source of computer training was exclusively self-instruction with no formal training, 25% (42) did not respond, and 66% (113) reported self-instruction with minimal hours of formal training. The detailed distribution of respondents' primary sources of training and the number of hours attending formal training are shown in Appendix L.

The summary statistics for hours of formal training attended by primary sources of training are shown in Table 13. The minimum and maximum hours of training the self-taught respondents reported as their primary source of training for the past 5 years, was 4 and 30 hours respectively. The mean, median, and mode were 12.2, 10, and 8 hours respectively with a standard deviation of 6.0 hours. This was based on 113 respondents who reported self-instruction with some formal training. The minimum and maximum number of hours reported by respondents who had attended formal training was 10 and 200 hours respectively. The mode was 60, mean 58.6, median 48, and standard deviation 38.2 hours.

Table 13

Summary Statistics of Hours of Training by Primary Source of Training

	Summary Statistics of Hours of Training					
Primary source of training	Mean	Median	Mode	Std. Deviation	Min.	Max.
Combination of self-taught and formal training (n = 113)	12.2	10	8	6.0	4	30
Formal training only (n = 91)	58.6	48	60	38.2	10	200
Overall	50.7	20	8	34.7	4	200

Note: Exclusive self-instruction and non-responses (*n = 58)* are excluded.

Research Question 1

What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based on gender and age categories?

Computer anxiety.

Total computer anxiety scores were computed by summing each respondent's computer anxiety values for all 18 questions. A four-point Likert scale (1=strongly disagree to 4=strongly agree) was used for each question. All positively worded statements (8 items) of the CARS were reversed scored prior to analysis so that the higher scores on all items indicated higher levels of computer anxiety. The possible total composite score of levels of computer anxiety ranged from 18 to 72 with the higher scores indicating a higher level of computer anxiety. The computed total computer anxiety scores were categorized as (a) very relaxed, 18 to 28; (b) generally relaxed, 29 to 39; (c) mildly anxious, 40 to 50; (c) anxious, 51 to 6; and (d) very anxious, 62 to 72.

Table 14 displays the overall levels of computer anxiety among faculty members. Ninety-four percent of the respondents' scores showed that they were categorized as either very relaxed or relaxed. Only 6% of the respondents fell under the category of mildly anxious. The mean score and standard deviation on computer anxiety were 29.7 and 6.2 respectively.

Table 14

Overall Computer Anxiety Levels

Level of computer anxiety	*N*	*%*
Very relaxed	118	45
Relaxed	129	49
Mildly anxious	15	6
Anxious	0	0
Very anxious	0	0
Total	262	100.0

Mean = 29.7 Median = 29.0 Standard deviation = 6.2

Table 15 reveals little difference in levels of computer anxiety between genders. The percentage of female respondents who were in the mildly anxious category was 6% which was slightly higher than the proportion for male respondents (5%) who were in the same category. By age categories, 6% of the respondents in both younger adults and middle-aged adults' groups showed a mildly anxious level. When combining the relaxed and very relaxed categories of levels of computer anxiety, 94% of the respondents' scores indicated that they fell into lower levels of computer anxiety.

Table 15

Levels of Computer Anxiety by Gender and Age Categories

	Computer Anxiety Level					
Variable	Very relaxed 18 – 28	Relaxed 29 – 39	Mildly anxious 40 – 50	Anxious 51 – 62	Very anxious 63 – 72	Total
Gender						
Female	45% (83)	49% (92)	6% (11)	0% (0)	0% (0)	100% (186)
Male	46% (35)	49% (37)	5% (4)	0% (0)	0% (0)	100% (76)
Age Categories						
Younger adults	43% (65)	51% (78)	6% (9)	0% (0)	0% (0)	100% (152)
Middle-aged adults	48% (53)	46% (51)	6% (6)	0% (0)	0% (0)	100% (110)

N = 262

Table 16 presents the cross-tabulation between academic ranks and levels of education with levels of computer anxiety. Among the academic rank groups, 100% of the professors and over 90% of all other academic ranks demonstrated that their levels of computer anxiety fell in the category of very relaxed or relaxed. Lecturers had the highest proportion (7%) of respondents in any academic rank that fell into the mildly anxious category. Furthermore, all respondents who had a doctoral degree showed that they were either very relaxed or relaxed on levels of computer anxiety, and over 90% who had a master's degree or a bachelor's degree responded

similarly. In contrast, only 6% who had a master's degree and 5% who had a bachelor's degree fell in the mildly anxious category.

Table 16

Levels of Computer Anxiety by Academic Rank and Levels of Education

	Computer Anxiety Level					
Variable	Very relaxed 18 – 28	Relaxed 29 – 39	Mildly anxious 40 – 50	Anxious 51 – 62	Very anxious 63 – 72	Total
Academic rank						
Junior Lecturer	48% (11)	48% (11)	4% (1)	0% (0)	0% (0)	100% (23)
Lecturer	40% (60)	53% (80)	7% (11)	0% (0)	0% (0)	100% (151)
Senior Lecturer	55% (24)	43% (19)	2% (1)	0% (0)	0% (0)	100% (44)
Assoc. Professor	50% (21)	45% (19)	5% (2)	0% (0)	0% (0)	100% (42)
Professor	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)
Level of education						
Professional degree	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	100% (1)
Bachelor's degree	55% (11)	40% (8)	5% (1)	0% (0)	0% (0)	100% (20)
Master's degree	43% (96)	51% (116)	6% (13)	0% (0)	0% (0)	100% (225)
Doctoral degree	69% (11)	31% (5)	0% (0)	0% (0)	0% (0)	100% (16)
Total	45% (118)	49% (129)	6% (15)	0% (0)	0% (0)	100% (262)

N= 262

As reported in Table 17, a majority of the respondents who had either self-instruction or formal training as their primary source of training showed that their levels of computer anxiety were in the categories of either relaxed or very relaxed with the use of computers. A higher proportion of respondents in urban areas indicated higher levels of computer anxiety than respondents in rural areas. Of 185 respondents in urban areas, 8% were in the mildly anxious category as compared to rural areas that only indicated 1%.

Table 17

Levels of Computer Anxiety by Primary Source of Training and Location

	Computer Anxiety Level					
Variables	Very relaxed 18 - 28	Relaxed 29 - 39	Mildly anxious 40 - 50	Anxious 51 - 62	Very anxious 63 - 72	Total
Primary source of training						
Self-taught	45% (77)	50% (85)	5% (9)	0% (0)	0% (0)	100% (171)
Formal training	45% (41)	48% (44)	7% (6)	0% (0)	0% (0)	100% (91)
Location						
Urban	45% (84)	47% (87)	8% (14)	0% (0)	0% (0)	100% (185)
Rural	44% (34)	55% (42)	1% (1)	0% (0)	0% (0)	100% (77)
Total	45% (118)	49% (129)	6% (15)	0% (0)	0% (0)	100% (262)

N = 262

The means and standard deviations on overall total composite CARS are shown in Table 18. The mean of the total CARS scores and standard deviation were 29.7 and 6.2 respectively. The mean total score of younger female adults was 30.0 and was slightly higher than the mean total score for all respondents. For younger male adults', the mean score was 29.3 which was slightly lower than the mean score for all respondents. The middle-aged male adults' group mean score (29.8) was higher than the female middle-aged adults' group (29.4) and the overall mean score (29.7) for all respondents.

A two-way ANOVA was used to determine whether statistically significant differences existed between subgroups of the population based upon gender and age categories. The result indicated that there were no significant mean differences between gender and age categories, nor was an interaction effect found between gender and age categories, $p > .10$ at $\alpha = .10$, as presented in Table 19.

Table 18

Mean and Standard Deviation of Computer Anxiety by Gender and Age Categories

Variable	N	Percent	Mean	Std. Deviation
Female				
Younger adults	117	63%	30.0	6.3
Middle-aged adults	69	37%	29.4	6.1
Total	186	100.0%	29.7	6.2
Male				
Younger adults	35	46%	29.3	6.8
Middle-aged adults	41	54%	29.8	5.4
Total	76	100.0%	29.5	6.1
Total				
Younger adults	152	58.0%	29.8	6.4
Middle-aged adults	110	42.0%	29.5	5.8
Total	262	100.0%	29.7	6.2

N = 262, *M* = 29.7

Table 19

Two-Way ANOVA on Computer Anxiety

Source	*df*	*MS*	*F*	*p*
Gender	1	1.4	.04	.85
Age categories	1	.05	.00	.97
Gender x Age categories	1	14.7	.38	.54

R^2 = .002 *N* = 262

Computer self-efficacy.

In determining the levels of computer self-efficacy among faculty, the research question was answered by analyzing the total composite self-efficacy scores. These ranged from 29 to 116 using all 29 questions with a four-point rating scale (1=strongly disagree to 4=strongly agree). High scores indicated high levels of computer self-efficacy. The scores were separated into four categories. These ranged from (a) 29 to 50, as not confident; (b) 51 to72, as having little confidence; (c) 73 to 94, as confident; and (d) 95 to 116, as very confident.

Table 20 displays the levels of computer self-efficacy among faculty. None of the respondents fell under the category of not confident with the use of computers, and over 97% of the respondents showed that their levels of computer self-efficacy were in the confident or very confident categories. The overall mean score and standard deviation on computer self-efficacy were 97.6 and 12.5 respectively. Both the mean and median scores were in the very confident category.

Table 20

Overall Computer Self-Efficacy Levels

Computer self-efficacy level	N	%
Not Confident	0	0
Little confidence	7	3
Confident	88	33
Very confident	167	64
Total	262	100.0

Mean = 97.6 Median = 99 Standard deviation = 12.5

Table 21 shows the cross-tabulation between gender and age categories with levels of computer self-efficacy. Male respondents displayed higher confidence levels than did females. Of the 76 male respondents, 67% showed that they were very confident in using computers, while 62% of female respondents indicated that they were very confident as well. Sixty-eight percent of the younger adult group fell in the category of very confident as compared to middle-aged adults at only 57%.

Table 22 presents the levels of computer self-efficacy by academic rank and levels of education. In the “very confident” category, all professors who participated in the study showed that they were very confident with the use of computers, followed by lecturers (68%), and then by junior lecturers (65%). On the “little confidence” level, 7% of associate professors displayed that they belonged in this classification, while other academic ranks indicated either 0% or 2%.

As for levels of education, 94% of those respondents who held doctoral degrees fell in the category of very confident, followed by 75% of the respondents who had bachelor's degrees.

Table 21

Levels of Computer Self-Efficacy by Gender and Age Categories

	Levels of Computer Self-Efficacy				
Variable	Not confident 29-50	Little confidence 51 - 72	Confident 73 - 94	Very confident 95 - 116	Total
Gender					
Female	0% (0)	3% (5)	35% (65)	62% (116)	100% (186)
Male	0% (0)	3% (2)	30% (23)	67% (51)	100% (76)
Age Categories					
Younger adults (18-39 years old)	0% (0)	1% (2)	30% (46)	68% (104)	100% (152)
Middle-aged adults (39-59 years old)	0% (0)	5% (5)	38% (42)	57% (63)	100% (110)

N = 262

Table 22

Levels of Computer Self-Efficacy by Academic Ranks and Levels of Education

	Computer Self-Efficacy Level				
Variable	Not confident 29 – 50	Little confidence 51 – 72	Confident 73 – 94	Very confident 95 – 116	Total
Academic rank					
Junior Lecturer	0% (0)	0% (0)	35% (8)	65% (15)	100% (23)
Lecturer	0% (0)	2% (3)	31% (46)	67% (102)	100% (151)
Senior Lecturer	0% (0)	2% (1)	48% (21)	50% (22)	100% (44)
Assoc. Professor	0% (0)	7% (3)	31% (13)	62% (26)	100% (42)
Professor	0% (0)	0% (0)		100% (2)	100% (2)
Level of education					
Professional degree	0% (0)	0% (0)	!00% (1)	0% (0)	!00% (1)
Bachelor's degree	0% (0)	0% (0)	25% (5)	75% (15)	100% (20)
Master's degree	0% (0)	3% (6)	36% (82)	61% (137)	100% (225)
Doctoral degree	0% (0)	6% (1)	0% (0)	94% (15)	100% (16)

N = 262

The primary source of training faculty had in the past five years did not affect the levels of computer self-efficacy, as displayed in Table 23. No more than 3% of the respondents were in the little confidence category, whether self-taught or participants of formal training groups. A majority (97%) were found to be at least confident in using computers. This is also true between locations. The percentages by levels of computer self-efficacy in urban and rural areas were identical in the four categories of computer self-efficacy: 63% were very confident, 34% were confident, and only 3% fell in the little confidence category.

Table 23

Levels of Computer Self-Efficacy by Primary Source of Training and Location

	Computer Self-Efficacy Level				
Variable	Not confident 29 – 50	Little confidence 51 – 72	Confident 73 – 94	Very confident 95 – 116	Total
Primary source of training					
Self-taught	0% (0)	3% (5)	32% (56)	64% (110)	100% (171)
Formal training	0% (0)	2%(2)	35% (32)	63% (57)	100% (91)
Location					
Urban	0% (0)	3% (5)	34% (62)	63% (118)	100% (185)
Rural	0% (0)	3% (2)	34% (26)	63% (49)	100% (77)

The mean and standard deviation of total composite computer self-efficacy scores among gender and age categories are shown in Table 24. The mean score of the male respondents was slightly higher than that of their female counterparts. The mean scores of the male and female groups were 98.8 and 97.0 respectively. Younger adults had slightly higher mean scores than middle-aged adults, regardless of gender.

Table 24

Mean and Standard Deviation of Computer Self-Efficacy by Gender and Age Categories

Variable	N	Mean	Std. Deviation
Female			
Younger adults	117	98.1	11.2
Middle-aged adults	69	95.2	13.3
Total	186	97.0	12.0
Male			
Younger adults	35	101.1	12.8
Middle-aged adults	41	96.9	13.8
Total	76	98.8	13.4
Total			
Younger adults	152	98.8	11.6
Middle-aged adults	110	95.8	13.4
Total	262	97.6	12.5

N = 262

A two-way ANOVA was performed to determine whether significant mean differences existed between gender and age categories,. The findings indicated that there were no significant differences between means by gender, nor was an interaction effect found between gender and age categories ($p > .10$ at $\alpha = .10$), as displayed in Table 25. However, the age category was found to be statistically significant ($p < .10$, at $\alpha = .10$)

Table 25

Two-Way ANOVA of Computer Self-Efficacy

Variable	*df*	*MS*	*F*	*p*
Gender	1	286.464	1.865	.173
Age categories	1	663.361	4.318	.039
Gender x Age categories	1	19.231	.125	.724

$R^2 = .022$ *N* = 262

Research Question 2

To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank,

levels of education, teaching experience, primary source of computer training, years of computer experience, years of computer use in instruction, and location) in predicting computer anxiety?

The Pearson's product-moment correlation coefficient was used to determine the relationship between variables. The interpretations of the directions and strengths of the relationship were based on the full scale of interpretations of the correlation coefficient suggested by Hinkle, Wiersma, and Jurs (1998) as discussed in Chapter 3.

The relationships between variables in this study are presented in Table 26. Total composite computer self-efficacy scores have a moderate negative correlation (r = -.60), and computer applications usage also has a low negative correlation (r = -.31) with total composite computer anxiety scores as shown in the table. These two independent variables had inverse linear relationships with computer anxiety and a moderate positive linear relationship with each other. All other independent variables have little correlation with computer anxiety. However, there was a high positive correlation (r = 0.84) between age and years of teaching experience at the university level. The academic rank of associate professor had moderate positive correlations with both years of teaching experience (r = 0.62) and age (r = 0.56), while the academic rank of junior lecturer had a high positive correlation (r = 0.72) with a bachelor's degree.

Stepwise multiple regression analysis was carried out to assess the relative contributions of computer-self efficacy, computer applications usage, and the selected characteristics to the explanations and prediction of computer anxiety. As reported in Table 27, computer self-efficacy alone explained 36.1% of the variance in computer anxiety. In model 2, by adding the academic rank of associate professor into the model, it explained an additional 1.6% of the variance in computer anxiety for a total of 37.7%. Both of these independent variables were statistically significant predictors, p-value < .10. Other independent variables were not statistically

Table 26

Correlations Coefficients between Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	1.00	**-0.60**	**-0.31**	-0.02	-0.03	0.03	0.08	-0.05	-0.06	-0.12	-0.05	0.13	-0.02	0.11	-0.17	0.00	-0.03	-0.06	-0.05	-0.11	-0.07
2		1.00	0.50	0.07	-0.12	0.05	0.04	-0.05	-0.06	0.09	0.01	-0.09	0.05	-0.10	0.10	-0.14	0.01	0.01	-0.02	0.17	-0.01
3			1.00	0.00	-0.15	-0.06	0.17	-0.04	-0.19	0.19	-0.01	-0.08	-0.02	0.01	0.03	-0.17	0.09	0.02	-0.02	0.09	0.05
4				1.00	0.20	-0.02	-0.05	0.05	0.02	0.04	0.02	-0.04	0.01	-0.03	0.05	0.09	-0.10	-0.08	-0.01	0.00	0.05
5					1.00	-0.32	-0.45	0.25	**0.56**	0.16	0.32	0.13	-0.27	0.00	0.27	**0.84**	-0.16	-0.08	0.59	0.32	-0.11
6						1.00	-0.36	-0.14	-0.14	-0.03	-0.07	-0.02	**0.72**	-0.49	-0.08	-0.28	0.00	0.01	-0.27	-0.20	0.16
7							1.00	-0.52	-0.51	-0.10	-0.13	-0.07	-0.22	0.32	-0.20	-0.53	0.07	0.02	-0.27	-0.09	0.01
8								1.00	-0.20	-0.04	-0.02	-0.03	-0.13	0.18	-0.12	0.27	0.04	0.01	0.20	0.09	0.07
9									1.00	-0.04	0.21	0.14	-0.13	-0.18	0.37	**0.61**	-0.17	-0.05	0.34	0.19	-0.19
10										1.00	0.19	-0.01	-0.03	-0.22	0.34	0.18	0.12	0.01	0.16	0.00	-0.06
11											1.00	0.13	-0.13	-0.10	0.26	0.36	-0.17	-0.06	0.27	0.22	-0.08
12												1.00	-0.02	-0.15	-0.02	0.14	-0.05	0.00	0.01	-0.07	-0.04
13													1.00	-0.71	-0.07	-0.25	0.00	0.04	-0.19	-0.16	0.13
14														1.00	-0.63	-0.06	0.00	-0.10	0.04	0.05	0.00
15															1.00	0.32	0.02	0.09	0.16	0.13	-0.13
16																1.00	-0.10	-0.03	0.51	0.41	-0.17
17																	1.00	0.67	0.04	-0.01	0.01
18																		1.00	0.10	0.11	0.01
19																			1.00	0.45	-0.16
20																				1.00	-0.09
21																					1.00

1. Total CARS
2. Total CSE
3. Total CAU
4. Gender
5. Age
6. Junior lecturer
7. Lecturer
8. Senior Lecturer
9. Assoc. Professor
10. Professor
11. Do you have a professional degree?
12. Professional degree
13. Bachelor's degree
14. Master's degree
15. Doctoral degree
16. Years of teaching experience at the university or college level
17. Primary source of computer training.
18. Number of hours of formal training attended in the past five (5) years
19. Number of years of using computers for any purpose.
20. Number of years of using computers in accounting instruction.
21. Location categories

significant in this prediction. These variables included whether respondents had professional degrees, a primary source of computer training in the past five years, hours of formal computer training, years of computer experience, and location, whether urban or rural areas. All of these independent variables have $R^2 < 0.5\%$ and $p > .10$ as shown in Appendix M.

Table 27

Stepwise Multiple Regressions in Predicting Computer Anxiety

Model		B	SE	β	*t*	*p*
1	(Constant)	59.578	2.874		20.732	.000
	Total CSE	-.310	.029	-.601	-10.649	.000
2	(Constant)	59.867	2.847		21.027	.000
	Total CSE	-.309	.029	-.600	-10.748	.000
	Assoc. Prof.	-2.169	.953	-.127	-2.276	.024

Note:
1. R = .601 R^2 = .361 F = 113.403, p < .10
2. R = .614 R^2 = .377 F = 60.470 p < .10

Research Question 3

To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based upon the same selected characteristics?

A computer applications usage scale was used to determine the extent to which computer applications had been used either as a tool to support instruction or taught to students as part of the course curriculum of the faculty. The faculty responded to 10 selected computer applications with the five point Likert scale (0= not available, 1 = never to 4 = always).

The most frequent computer application used by faculty was word processing with a mean score of 3.86 and standard deviation of 0.43 as shown in Table 28. This was followed by the use of the Internet, and electronic mail. The two computer applications that have least usage, enterprise resource planning and auditing software; had mean scores of 0.71 and 0.76

respectively. The standard deviation for these two computer applications were 0.80 and 0.76 correspondingly.

Table 28

Summary Statistics of Computer Applications Usage

Type of computer application	Mean	Median	Mode	Std. Deviation
Word processing (e.g., Microsoft Word, Word Perfect)	3.86	4	4	0.43
Internet	3.76	4	4	0.66
Electronic mail	3.60	4	4	0.86
Spreadsheets (e.g., Excel, Lotus 1-2-3)	3.47	4	4	0.78
Presentation software (e.g., PowerPoint)	3.42	4	4	0.85
Accounting software (e.g., UBS, MYOB, ACCPAC)	2.21	2	2	1.09
Database (e.g., Access)	1.80	2	1	0.93
Simulations (e.g., models a specific environment/situation)	1.62	1	1	0.85
Auditing software (e.g., IDEA, ACL)	0.76	1	1	0.76
Enterprise resource planning (e.g., SAP, Navision)	0.71	1	0	0.80

N=262

Table 29 displays the non-availability and usage frequency of computer applications. There were contradicting results reported by respondents with regards to non-availability of two types of computer applications: (a) auditing software and (b) enterprise resource planning. Forty-five percent of the respondents reported enterprise resource planning software was not available, whereas the others reported otherwise. Similarly, with auditing software, 41% of the respondents claimed the non-availability of the software, and others reported otherwise.

A follow-up was made by phone calls to research coordinator in each branch to determine the availability of the software. It was found that the two types of software were not available in any of the 11 branches. Though some of the respondents indicated that the two types of

Table 29

Non-Availability and Frequency of Computer Applications Usage

	Frequency of Usage					
Type of computer application	Not Available	Never	Sometimes	Often	Always	Total
Enterprise resource planning	119	113	20	8	2	262
	45.4%	43.1%	7.6%	3.1%	0.8%	100.0%
Auditing software	106	121	30	3	2	262
	40.5%	46.2%	11.5%	1.1%	0.8%	100.0%
Simulations	0	152	67	34	9	262
	0.0%	58.0%	25.6%	13.0%	3.4%	100.0%
Databases	0	121	95	23	23	262
	0.0%	46.2%	36.3%	8.8%	8.8%	100.0%
Accounting software	0	81	96	33	52	262
	0.0%	30.9%	36.6%	12.6%	19.8%	100.0%
Electronic mail	0	18	11	30	203	262
	0.0%	6.9%	4.2%	11.5%	77.5%	100.0%
Internet	0	9	5	26	222	262
	0.0%	3.4%	1.9%	9.9%	84.7%	100.0%
Presentation	0	8	36	57	161	262
	0.0%	3.1%	13.7%	21.8%	61.5%	100.0%
Spreadsheet	0	0	47	45	170	262
	0.0%	0.0%	17.9%	17.2%	64.9%	100.0%
Word Processing	0	0	8	21	233	262
	0.0%	0.0%	3.1%	8.0%	88.9%	100.0%

applications software were available, the explanation is that most likely they had it on their own computer or had attended courses. From the table, a majority of the respondents (100%) had used word processing and spreadsheet as a tool to support instruction or taught students as part of the curriculum. A cross-tabulation between computer applications usage and gender demonstrated that there were no differences in frequency of usage of the computer applications, as provided in Appendix N. Similarly, there were no differences with computer applications usage between gender and age categories, as shown in Appendix O.

In Table 30, the researcher combined the options “Sometimes” to “Always” into a “Used” category. This was to ease the comparison between the computer applications that were not available, never used, and used in rural and urban areas. From responses from faculty in the urban areas, 56.2% indicated that they never used the simulations, followed by 47.0% database and auditing, 43.8% enterprise resource planning, and 35.1% accounting software. In rural area, however, 62.3% of the respondents did not use the simulation, 44.2% database and auditing, 41.6% enterprise resource planning, and 20.8% accounting software. The highest percentage difference (14.1%) between locations related to non-usage of the computer applications was accounting software. Respondents from urban areas reported 35.1%, while only 20.8% were from rural areas.

Table 30

Non-Usage and Availability of Computer Applications by Location

	Urban			Rural		
Type of computer application	Not Available	Never used	Used	Not Available	Never used	Used
Simulation	0 0.0%	104 56.2%	81 43.8%	0 0.0%	48 62.3%	29 37.7%
Databases	0 0.0%	87 47.0%	98 53.0%	0 0.0%	34 44.2%	43 55.8%
Auditing	75 40.5%	87 47.0%	23 12.4%	31 40.3%	34 44.2%	12 15.6%
Enterprise resource planning	85 45.9%	81 43.8%	19 10.3%	34 44.2%	32 41.6%	11 14.3%
Accounting software	0 0.0%	65 35.1%	120 64.9%	0 0.0%	16 20.8%	61 79.2%
Electronic mail	0 0.0%	14 7.6%	171 92.4%	0 0.0%	4 5.2%	73 94.8%
Internet	0 0.0%	7 3.8%	178 96.2%	0 0.0%	2 2.6%	75 97.4%
Presentation	0 0.0%	4 2.2%	181 97.8%	0 0.0%	4 5.2%	73 94.8%
Spreadsheet	0 0.0%	0 0.0%	185 100.0%	0 0.0%	0 0.0%	76 100.0%
Word processing	0 0.0%	0 0.0%	184 100.0%	0 0.0%	0 0.0%	77 100.0%

Urban *N = 185* Rural *N = 77*

Summary

This chapter reports the findings of the research study. From the 368 questionnaires distributed, 262 surveys were returned and recorded. A test revealed that there was no indication to suggest that respondents' grouped by genders and UiTM locations were significantly different from the population distributions or contained any element of bias. The respondents' age ranged from 25 to 55 years and they held academic ranks from junior lecturer to professor with teaching experience ranging from 1 to 31 years. A majority of the respondents indicated self-instruction as their primary source of training. The hours of formal training reported by the respondents were between 10 and 200 hours.

The study revealed that most of the respondents had low levels of computer anxiety. A two-way ANOVA revealed that there were no significant mean difference between gender and age categories, nor was an interaction effect found between gender and age categories. Further, a majority of the respondents showed high levels of computer self efficacy. The finding did not reveal statistically any significant mean difference between genders nor was an interaction effect found among gender and the levels of computer self-efficacy. However, the results of the test demonstrated that there was a significant mean difference between age categories pertaining to the levels of computer self-efficacy.

The Pearson's product-moment correlation coefficient was used to determine the directions and strengths of the relationship between variables. It was revealed that the levels of computer self-efficacy have a moderate negative correlation with computer anxiety. As for the relationship between computer applications usage and computer anxiety, it indicated a low negative correlation. Stepwise multiple regression analysis was carried out to predict and evaluate the relative contributions of computer-self efficacy, computer applications usage, and

other selected characteristics towards computer anxiety. The test revealed that computer self-efficacy alone is the most significant predictor, explaining 36.1% of the variance in computer anxiety. Other variables are not statistically significant in predicting this. Further discussions about the findings are presented in Chapter 5.

Chapter 5

Findings, Discussion, Recommendations, and Summary.

The continuous development of technology and information systems has prompted nations to be more competitive to produce a more technologically literate workforce. By the year 2020, Malaysia intends to be a fully developed country, and to achieve this objective, it has embarked on various information technology projects to keep abreast with the information era (Hamid, 1993). To ensure that college graduates are proficient with the use of technology, widespread use of computers and related information and communications technology was integrated in educational settings. The country has also implemented smart schools where students gain hands-on experience with computers to provide technologically literate graduates. Upon their high school graduation, these students will have some computer proficiency before entering colleges. All higher education institutions in Malaysia will be affected by the development in the education system, and this includes the Faculty of Accountancy at Universiti Teknologi Mara (UiTM), Malaysia. While this college has begun integrating computer technologies in classrooms, there has not been any research conducted to ascertain the rate and the extent of integration, the baseline computer experience among the faculty members, and their levels of anxiety or self-efficacy with regard to computer usage.

The purpose of this study has been to determine the levels of computer anxiety, computer self-efficacy, and the extent to which computer applications have been used either as a tool to support instruction or taught to students as part of the course curriculum. This study provides a baseline of the levels of computer integration within the overall educators' preparation curriculum to teach accounting subjects. The instrument used in this study provides useful

information for faculty to examine their computer integration efforts and to establish a focus for future personal development.

Methodology and Survey Instruments

The population for this study comprised all full-time accounting faculties from 11 branches of UiTM during academic year 2006/2007. The survey instruments were distributed by research coordinators at each branch in the final week of December 2006 to 368 accounting faculty members. The research coordinators also managed and oversaw the progress of the response from faculty and sent reminders so as to encourage participation in the study. Of the 368 questionnaires distributed, 262 were returned, and all were used for the data analysis, a 71% response rate.

The questionnaires distributed were aimed to learn more about the faculty members personal feelings when working with computers, as well as their levels of confidence and computer usage. The survey instrument consisted of four parts: (a) computer anxiety rating scale, (b) computer self-efficacy scale, (c) computer resource usage, and (d) general information regarding participants. The computer anxiety rating scale was used in determining the levels of computer anxiety. It was based on Computer Anxiety Rating Scale (CARS) developed by Hienssen, Glass and Knight (1987) with three modifications of the original version. The modifications involved reformatting of the Likert scale, deleting of an obsolete item, and changing some of the terminology. All positively worded statements in this instrument were reversed coded prior to analysis. A total composite score of computer anxiety ranged from a minimum of 18 to a maximum score of 72 with the higher scores signifying higher computer anxiety.

The 29-item section to measure computer self-efficacy included in the questionnaire was based on the Durndell, Haag and Laithwaite (2000) research, with two modifications. These were related to the Likert scale, and the rewording of some terms associated with computer terminology. The total composite scores on computer self-efficacy ranged from a minimum of 29 to a maximum score of 116 with the higher scores indicating greater confidence in computer usage.

To measure respondents' computer applications usage, a modified version of the computer resource usage scale by Miller (1997) was included in the survey instrument. Miller developed this scale to determine the types of software that were frequently used by vocational teachers. Graphic applications and interactive technology categories from the original instrument were eliminated since these were not emphasized by the AICPA (1999) nor commonly used in accounting practices. Accounting, auditing, and enterprise resource planning software were included in the instrument because they are widely used by accounting professionals.

Descriptive statistics were used to describe the population and the computer applications usage. Inferential statistics were used to determine whether the respondents were representative of the population in terms of gender and location. Stepwise multiple regression was used to determine whether the characteristics of interest were useful in predicting the faculty levels of computer anxiety. The study's findings were drawn from analyzed data related to the three research questions:

1. What are the levels of computer anxiety and computer self-efficacy of the faculty of accountancy at UiTM, and what differences exist between subgroups of the population based upon gender and age categories?

2. To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, hours of formal computer training, years of computer experience, years of computer use in instruction, and location)?
3. To what extent do faculty use computer applications in their instruction, and what differences in usage exist between subgroups based upon the same selected characteristics?

Findings

The survey instruments were distributed to all 368 accounting faculty members of UiTM, and although the entire population was surveyed, 29% did not return the questionnaires. Tests of null hypotheses were carried out to determine whether sample bias existed based upon systematic non response among the sub-groups of gender and location. The study found that there was no evidence to suggest that the respondent group's gender and UiTM location distributions were significantly different from the population distributions.

Location

The study revealed that a majority of the respondents (71%) were from urban areas while 29% from rural areas. Out of 106 non-respondents, 65% of them were from urban areas and the remaining 35% were from rural areas.

Gender

Seventy-one percent of the respondents were female and 29% were male.

Age

The respondents' age ranged from 25 to 55 years. The mean age for females was 37.8, median 36, mode 34, and standard deviation 6.6 years. As for male respondents, they were on average older than the female group. The mean age was 40.9, median 40.5, mode 38, and standard deviation 7.6 years. The youngest ages reported were 25 for a female and 28 for a male. Both male and female groups included persons 55 years old, one year from reaching the mandated retirement age of 56.

Teaching Experience

This ranged from 1 to 31 years. The overall mean number of years of teaching experience was 11.3, with a standard deviation of 6.6. Male respondents on average had more teaching experience at the university level. As for females the mean and standard deviation for this was 10.9 and 6.5 years respectively.

Academic Rank

The respondents ranked from junior lecturer to professor. Nine percent (9%) of the respondents were junior lecturers, 57% were lecturers, 17% were senior lecturers, 16% were associate professors, while the remaining 2% were professors. The urban areas had more respondents with higher academic rank: 21% associate professors and less than 1% professors as compared to rural, with only 5% having a highest academic rank of associate professor. Rural areas had the most respondents holding current academic rank as junior lecturers, with 16% as compared to urban with 6%. A majority of the respondents in both locations held academic ranks as lecturers: 57% in urban and 58% in rural areas.

Levels of Education

This study revealed that 86% of the respondents reported they held master's degrees, 8% indicated they had bachelor's degrees, while the remaining 6% had doctoral degrees.

Primary Source of Training

Thirty-five percent of the respondents reported that they had acquired new knowledge and use of new computer applications through formal training. Although the remainder indicated that self-instruction was the primary source of their training, the majority of those (66%) had engaged in some formal training as well.

Discussion

Research Question 1

Research question one was aimed to investigate the levels of computer anxiety and computer self-efficacy among accounting educators and what differences exist between subgroups of the population based upon gender and age categories. The characteristics of the accounting faculty members responding to the survey instrument are summarized as follows.

Computer anxiety.

In determining the levels of computer anxiety among faculty, the research question was answered by analyzing the total composite anxiety scores. These were computed by summing each respondent's computer anxiety values for all 18 questions. The possible composite total score of computer anxiety ranged from 18 to 72 with the higher scores indicating higher levels of computer anxiety. The computed total computer anxiety scores were categorized as (a) very relaxed, 18 to 28; (b) generally relaxed, 29 to 39; (c) mildly anxious, 40 to 50; (c) anxious, 51 to 61; and (d) very anxious, 62 to 72.

This study found that the faculty had a mean score of 29.7 (N = 262) on the overall computer anxiety scale. The mean score on computer anxiety in this study fell under the category of generally relaxed. Little variability was found in this population (SD = 6.2) indicating respondents were from a homogeneous group, perhaps because the population studied are all accounting faculty members at UiTM, Malaysia. Further, the findings from this research demonstrated that the mean scores of the two subgroups of the population revealed no significant mean differences within the gender and age categories, nor was an interaction effect found between gender and age categories, $p > .10$ at $\alpha = .10$, relating to computer anxiety. The result was consistent with earlier studies. The study conducted by Heinssen et al. (1987), based on the 19-item CARS with 270 introductory psychology students, found that gender average scores were not statistically significant. Igbaria and Parasuraman (1989) also reported the same result with 166 managers that showed no significant mean differences between genders on computer anxiety. This indicates that accounting faculty members at the UiTM, regardless of gender, feel competent and relaxed when using computers either at home or at the office, thus resulting in lower levels of computer anxiety

However, there were also some contradictions with other research. While this study revealed that there were no mean differences in computer anxiety between genders, the studies conducted by Gilroy and Desai (1985) with male and female participants, Dambrot, Malek, Siling, Marshall, and Garver (1985) with freshman in an introductory psychology class at a mid-western state university, Czaja, Charness, Fisk, Hertzog, Nair, Rogers, and Sharit (2006) with adults aged 18 to 91 years old indicated otherwise. These contradictions were probably due to the time and participants involved in the research. The study conducted by Dambrot et al. was conducted in 1985, and it involved freshman students who normally had just graduated from

high school. During that time, computer technology was still new and not as widely used as it is today. As with the research by Czaja et al., it involved a study of a wider age range from younger adults (aged 18) to older adults with the age reaching 91 years. However, in the present study the participants were accounting educators who had a wide range of experience using computers during their college education. The age range for this study was younger adults to middle-aged adults, with the oldest being 55 years of age.

Computer self-efficacy.

In determining this level among faculty, the research question was answered by analyzing the total composite self-efficacy scores (CSE). The possible scores ranged from 29 to 116 using all 29 questions. High scores indicated high levels of computer self-efficacy, while low scores indicated the opposite. The scores were categorized into four groups: (a) 29 to 50 as not confident, (b) 51 to72 as having little confidence, (c) 73 to 94 as confident, and (d) 95 to 116 as very confident.

In this study, the faculty mean score on overall computer self-efficacy was 97.6 (N=262, SD = 12.5). The mean score was in the very confident category. As for gender, males reported higher mean scores (M = 98.8) than females (M = 97.0). This difference was not statistically significant. This finding was also consistent with the findings by Durndell et al. (2000) who reported no significant mean difference between genders related to computer self-efficacy in computer beginning skills.

However, this research finding does not support the Torkzadeh and Koufteros (1994) study with business undergraduate students. The authors found the mean scores between genders were significantly different before the participants attended formal computer training. Furthermore, Cassidy and Eachus (2002) also reported that there was a significant mean

difference between males and females pertaining to computer self-efficacy. The authors study involved a sample from a diverse group of populations including academics, undergraduates, postgraduate students, and professionals in health care. The differences in the results might be due to the nature of the populations because again the present research only involved accounting educators in a college.

Moreover, the present study revealed that age categories were statistically significant in determining the levels of computer self-efficacy. This result is similar to the findings by Charness, Schumann, and Boritz (1992), with older adults in performing computer procedures; Ellis and Allaire (1999), among older adults; and Czaja et al. (2006), among adults aged 18 to 91. The results of this study showed that 58% of the respondents were in the younger adult group and had higher levels of computer self-efficacy as compared to the respondents in the middle-aged adult group. This may indicate that the younger adult group had fewer problems in learning to use and operate current technologies than older generations. This is probably due to the fact that the younger generations were more exposed to computer usage and were less hesitant using computer privately or during educational instruction.

Research Question 2

The objective of this research question is to understand the extent to which various levels of computer anxiety can be explained by differences in computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, primary source of computer training, hours of formal training, years of computer experience, years of computer use in instruction, and location).

This study revealed that there was an inverse linear relationship between computer anxiety with computer self-efficacy and computer applications usage. A moderate negative

correlation (r = -.60) was found between computer anxiety and computer self-efficacy. The result was comparable to the findings by Chu and Spires (1991) in which computer anxiety was negatively correlated to skills and confidence. The result also supports the findings by Igbaria and Iivari (1995) who concluded that individuals with a high computer self-efficacy will interact with computers and be less anxious than a person with a low computer self-efficacy. Further, the relationship between computer anxiety and computer applications usage showed there was a low negative correlation (r = -.31). It was thus concluded that respondents with lower computer self-efficacy were less likely to use computer software applications in general. This is coherent with the contention that groups with lower self-efficacy demonstrate less enthusiasm to engage in an activity than do those with higher self-efficacy (Bandura, 1997).

The stepwise multiple regression analysis was carried out to assess the relative contributions of computer-self efficacy, computer applications usage, and the selected characteristics to the explanations and predictions of the levels of computer anxiety. The findings disclosed that computer self-efficacy and the academic rank of associate professor were the best predictors of computer anxiety. Computer self-efficacy alone explained 36.1% of the variance in computer anxiety. An additional 1.6% of the variability in computer anxiety was explained by adding the academic rank of associate professor to the model, producing a total variance of 37.7%. This can be associated with the nature of the population in terms of age and location where a majority of the associate professors were in the middle-aged group and taught in urban areas. Even though including the academic rank of associate professor in the prediction model increased the amount of variance explained, it did not provide a statistically significant contribution to the explanation as compared to the model using only computer self-efficacy.

This study also found that other independent variables such as professional degree, levels of education, primary source of computer training, hours of formal computer training, years of teaching experience, years of computer experience, years of computer use in instruction, and location whether urban or rural were not significant in predicting computer anxiety. All of these independent variables had $R^2 < 0.5\%$ and p-value > .10.

Research Question 3

The objective of this question is to uncover the extent of computer applications usage among faculty in their instruction, and the differences in usage that exist between subgroups based upon the same selected characteristics.

The study revealed that faculty most commonly used general computer applications; word processing, Internet, electronic mail, spreadsheet, and presentation software, with mean usage scores of 3.86, 3.76, 3.60, 3.47, and 3.42 respectively, on a 4.0 scale. The result supports the research by Graham (1993) and Burnett (2003) concerning the importance and working knowledge using these applications software. Moreover, the finding of this study showed a higher overall mean usage scores for computer applications than the findings of Miller (1997); who reported the following means on a 4.0 scale: word processing, $M = 3.3$; Internet, $M = 1.9$; electronic mail, $M = 2.2$; spreadsheet, $M = 2.2$; and presentation software, $M = 2.1$. These applications are general in nature and possess flexibility that allows them to be used both outside and inside educational settings. The difference in the overall mean usage score of this study with Miller may have been due to when the research was conducted and the accessibility to computer technology. Miller's research was conducted in 1997, and most probably the use of computer technology at that time was not as widespread as in recent years. Subsequently, this study has revealed that word processing emerged as the most frequently used software by accounting

faculty members at UiTM. This result was consistent with other research findings by Becker (1991), Hogan (1994), and Miller. Since the branches were equipped with local area networks, respondents could use Web browsers to do online research and use electronic mail to correspond with their students, colleagues, family, and friends. The spreadsheet could be used for calculation and preparing financial statements, while the presentation software could be used for instructional delivery in classrooms.

The least used computer applications types were those directly related to accounting practices: enterprise resource planning (M = 0.71) and auditing software (M = 0.76). The standard deviation for enterprise resource planning was 0.80 and for auditing software, 0.76. Of the 262 respondents, 45% reported enterprise resource planning and 41% reported auditing packages were not available for use at the UiTM. Indeed, a follow-up call made to the research coordinators in each branch and revealed that the applications were not available. Although some of the respondents had indicated using these applications, the reason was most likely that they had attended courses related to it, had the software installed on their personal computers, or were self-taught. This supports the study of McEwen (1996) and Redmann, Kotrlik, Harrison, and Handley (1999), who found that the majority of faculty members advanced through self-taught learning.

It was also revealed that faculty in urban areas reported less use of computer application directly associated to accounting practices as compared to faculty in rural areas. Perhaps this can be explained by the fact that there were higher percentages of younger adults teaching in rural areas. They were more exposed to using computers during their college education, thus allowing them to be more comfortable when using technology while teaching their classes. Further,

faculty in the younger adult group may model their teaching approach based on what they had learned and how they were taught when they were in college.

The American Institute of Certified Public Accountants (AICPA) (1999) stated that accounting educators should use technology in their classes to help students to both develop technical literacy and master accounting content. Applications such as word processing, spreadsheet, presentation, accounting and auditing software, the Internet, e-mail, and other technologies may assist educators to improve and manage the learning environment. Calls for education reform had been made in recent years to emphasize knowledge and skills related to information technology and computing (Braathen & Robles, 2000; Brown, 2000). It is believed that through technical knowledge, accountants should be able to communicate with their colleagues and experts in their field. In the educational scope, accounting educators should be able to accomplish similar tasks with other professionals, to use technology and develop new instructional methods in their instruction.

Conclusions

This study was delimited to a single higher education institution in Malaysia and was related to a single subject area. It involved the accounting faculty of all 11 branches of UiTM and was conducted in the year 2006. In addition, it was based on the faculty personal dispositions, opinions, and perceptions of computer anxiety and computer self-efficacy through self-reported assessment. Therefore, the findings of this study cannot be generalized to represent all educators in the higher education institutions in Malaysia.

Neither gender nor age, affect the computer anxiety level of accounting faculty at UiTM. However, older faculty members, regardless of gender, are less confident of their computer usage skills. This is consistent with the results of the study by Heinssen et al. (1987), Igbaria and

Parasuraman (1989), and Ray and Minch (1990) but contradicts the research results derived by Gilroy and Desai (1985), Dambrot et al. (1985), Reinen and Plomp (1993), Dyck and Smither (1996), and Czaja et al. (2006) which found otherwise.

The best predictor of level of computer anxiety is level of computer self-efficacy. Thirty-six percent of the variation in computer anxiety can be explained by the regression model with computer self-efficacy as a single predictor alone. Moreover, an inverse relationship exists between computer anxiety and computer self-efficacy. It indicated that computer self-efficacy is an important factor in determining the accounting faculty levels of computer anxiety and the extent to which computer applications had been used either as a tool to support instruction or taught to students as part of the course curriculum. This study's findings support the conclusions by Igbaria and Iivari (1995) who concluded that individuals with a high level of computer self-efficacy will interact with computers with confidence and are less anxious than a person with low computer self-efficacy.

The instruments used in this study have validity across different cultures, locations, and groups. The computer anxiety rating scale was used by Heinssen et al. (1987) among psychology students and by Harrison and Rainer (1992) among university personnel. In addition, the computer self-efficacy scale was used by Murphy, Coover, and Owen (1989) with graduate students, adult vocational students, and professional nurses while Harrison and Rainer used it among university personnel, Torkzadeh and Koufteros (1994) among business graduates, and Durndell et al. (2000) among students at a university at the end of the participants' first academic year in Romania and Scotland. Hence, the validly of the instruments used was demonstrated as they produced similar, and predictable results in different groups at different locations.

Software packages that are specifically used in accounting practices are not commonly used or taught by accounting faculty at UiTM, Malaysia. A majority of the respondents frequently used general applications software such as word processing, Internet, and e-mail, spreadsheet, and presentation software and the flexibility of those programs allows them to be used in education settings and for personal use. However, specific applications software such as enterprise resource planning and auditing packages are infrequently used or taught in the accounting program at UiTM.

Self-instruction is the primary method of staying current with computer technology. The study found that self-instruction was a major factor in the high level of computer self-efficacy among faculty. This may indicate self-taught learning in technology usage has increased in importance in recent years because computer technology such as the Internet promotes self-directed learning. Hence, frequent use and exposure to computer applications have resulted in lower computer anxiety and higher levels of computer self efficacy.

Recommendation for Practice

While computers were frequently used by the faculty in the accounting department, auditing software and enterprise resource planning software that are related to accounting practices were not available, used, or taught in the college. Therefore, it is recommended that the UiTM make these software and other accounting packages that are frequently used in the accounting field available to faculty. With such applications software available, the faculty may utilize them, since the main source of training for a majority of the respondents was self-taught. In addition, having these applications software packages in the computer networks, the accounting faculty may be able to educate students with wider accounting skills using the available resources.

A comprehensive training program should be designed for the faculty members. This will concern with the middle-aged group since the findings indicated that age categories were significant in determining the levels of computer self-efficacy. The training approach should be designed to meet the needs of this group and hence increase the levels of confidence among them. Policies that provide incentive and opportunities for advancement should be formulated for respondents, who indicated self-taught as their primary source of training.

Recommendations for Future Study

Further research in the following areas would be beneficial and contribute to the current body of knowledge of this subject:

1. This study used subjective, self-reported measures of computer anxiety and computer self-efficacy; hence, the results are a measure of how the respondents perceived their own competence and not an actual demonstration of competence. Further studies could thus be conducted by providing tasks to be completed within a specified time using the available computer applications, and having the respondents answering a few short questions when the tasks are completed. The questions may focus on the respondents' levels of anxiety and self-efficacy, and allow them to rate themselves. These results may reveal different and interesting outcomes since the respondents have personally to prove themselves.
2. In this research, only the faculty of accountancy at UiTM was studied. Further research could be conducted among accounting educators in all public and private universities for comparison. This might reveal similarities and differences between the two types of colleges. The findings might also be used as a baseline of standard performance, and administrators of the colleges could see the levels of computer anxiety and self-efficacy among their faculty members for follow-up action.

3. Many respondents indicated that they were self-taught in terms of computer exposure. The result was also consistent with Bartlett and Kotrlik's (2001) finding, which indicated self-taught learning in technology usage has increased in importance in recent years because computer technology such as the Internet promotes self-directed learning. Therefore, a study should be conducted to determine factors that encourage faculty to spend time to keep themselves abreast of computer technology.
4. This study only focused on the educator, but not the students. There was no information gathered as to the extent of the knowledge acquired by the students and their self-efficacy. Furthermore, the effectiveness of faculty instruction using technology is still unknown. Hence, a study to determine the levels of computer self-efficacy among students and the use of computer technology could shed some light on the effectiveness of the instruction.

Summary

The study revealed that the accounting faculty members at UiTM had low levels of computer anxiety and high levels of computer self-efficacy. Additionally, faculty members levels of computer anxiety were unaffected by either gender or age categories, nor was an interaction between gender and age relating to computer anxiety. With regard to levels of computer self-efficacy, a majority of the respondents fell into the very confident category and age was related to the level of computer self-efficacy reported by participants regardless of gender.

An inverse linear relationship between computer anxiety with computer self-efficacy and computer applications usage was found which is consistent with expectation theory as postulated by Bandura (1997). The stepwise multiple regression analysis revealed that the most efficient model in predicting the levels of computer anxiety was computer self-efficacy. That variable

alone explained 36.1% of the variability in computer anxiety. It was also discovered that the faculty most commonly used general computer applications such as word processing, the Internet, electronic mail, spreadsheets, and presentation software. The least commonly used computer applications were those directly related to accounting practices: enterprise resource planning and auditing software. However, these types of computer applications were found not to be available for use at the UiTM. Furthermore, the findings indicated that a majority of the respondents advance themselves in the use of computer technology through self-learning.

Since this study was delimited to the accounting faculty at all 11 branches of UiTM and was based on personal dispositions, opinions, and perceptions, the findings of this study cannot be generalized to represent all educators in higher education institutions in Malaysia.

References

American Institute of Certified Public Accountant (AICPA), (1999). Fostering changes in curriculum and teaching methods. from http://www.aicpa.org/edu/foster.htm

Adams, N. B. (2002). Educational computing concerns of postsecondary faculty. *Journal of Research on Technology in Education, 34*(3), 285-303.

Bandura, A. (1986). *Social foundations of thoughts and action: A social cognitive theory*. Englewood Cliffs, New Jersey: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Worth Publishers.

Bandura, A. (1999). Social cognitive theory of personality. In L. Pervin & O. John (Eds.), *Handbook of Personality* (2nd. ed.). New York: Guilford.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52,* 1-26.

Beckers, J. J., Wicherts, J. M., & Schmidt, H. G. (2006). Computer anxiety: "Trait" or "State"? *Computers in Human Behavior, xxx*(xxx), 1-12.

Bozionelos, N. (2001). The relationship of instrumental and expressive traits with computer anxiety. *Personality and Individual Differences, 31*(6), 955-974.

Braathen, S., & Robles, M. (2000). The importance of assessment in business education. In J. Rucker & R. J. Schoenrock (Eds.), *National Business Education Yearbook,* (Vol. 38, pp. 11-24). Reston, Virginia: National Business Education Association.

Bradlley, G., & Russell, G. (1997). Computer experience, school support and computer anxieties. *Educational Psychology, 17,* 267-284.

Brown, B. J. (2000). New assessment strategies to improve business teacher preparation. In J. Rucker & R. J. Schoenrock (Eds.), *National Business Education Yearbook* (Vol. 38, pp. 143-157). Reston, Virginia: National Business Education Association.

Burnett, S. (2003). The future of accounting education: A regional perspective. *Journal of Educational for Business, 78*(3), 129-134.

Busch, T. (1995). Gender differences in self-efficacy and attitudes toward computers. *Journal of Educational Computing Research, 12*(2), 147-158.

Cambre, M. A., & Cook, D. L. (1985). Computer anxiety: definition, measurement and correlates. *Journal of Educational Computing Research, 1*(1), 37-54.

Campbell, R. J. (2004). Older women and the internet. *Journal of Women and Aging, 16,* 161-174.

Cassidy, S., & Eachus, P. (2002). Developing the computer user self-efficacy (CUSE) scale: Investigating the relationship between computer self-efficacy, gender and experience with computers. *Journal of Educational Computing Research, 26*(2), 133-153.

Chou, H. W. (2001). Effects of training method and computer anxiety on learning performance and self-efficacy. *Computers in Human Behavior, 17*(1), 71-94.

Chu, P. C., & Spires, E. E. (1991). Validating the computer anxiety rating scale: Effects of cognitive style and computer courses on computer anxiety. *Computers in Human Behavior, 7*(1), 7-21.

Chua, S. L., & Chen, D. T. (1997). A review on studies of computer anxiety in the 90s. In Z. Halim, T. Ottmann, & Z. Razak (Eds.), *Proceedings of the International Conference on Computer in Education* (pp. 822-829). Sarawak: Universiti Malaysia Sarawak.

Chua, S. L., Chen, D.T., & Wong, A. F. L. (1999). Computer anxiety and its correlates: A meta-analysis. *Computers in Human Behavior, 15*(5), 609-623.

Coakes, S. J., & Steed, L. G. (2003). *SPSS: Analysis without anguish: Version 11.0 for Windows*. NSW: John Wiley & Sons Australia, Ltd.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2).

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., et al. (2006). Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement. *Psychology and Aging, 21*(2), 333-352.

Czaja, S. J., & Sharit, J. (1999). Performance of a complex computer-based trouble shooting task in the bank industry. *International Journal of Cognitive Ergonomics and Human Factor, 3*(1), 1-22.

Dambrot, F. H., Watkins-Malek, M. A., Silling, S. M., Marshall, R. S., & Garver, J. A. (1985). Correlates of sex differences in attitudes toward and involvement with computers. *Journal of Vocational Behavior, 27*(1), 71-86.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Delcourt, M. A. B., & Kinzie, M. B. (1993). Computer technologies in teacher education: The measurement of attitudes and self-efficacy. *Journal of Research and Development in Education, 27*(1), 35-41.

Durndell, A., Haag, Z., & Laithwaite, H. (2000). Computer self efficacy and gender: A cross cultural study of Scotland and Romania. *Personality and Individual Differences, 28*(2000), 1037-1044.

Dyck, J. L., & Smither, J. A.-A. (1996). Older adults' acquisition of word processing: The contribution of cognitive abilities and computer anxiety. *Computers in Human Behavior, 12*(1), 107-119.

Dyck, J. L., & Smither, J. A. A. (1994). Age differences in computer anxiety: The role of computer experience, gender and education. *Journal of Educational Computing Research, 10*(3), 239-248.

Elasmar, M. G., & Carter, M. E. (1996). Use of e-mail by college students and implications for curriculum. *Journalism and Mass Communication Educator, 51*(2), 46-54.

Elder, V. B., Gardener, E. P., & Ruth, S. R. (1987). Gender and age in technostress: Effects on white collar productivity. *Government Finance Review, 3*(6), 17-21.

Ellis, R. D., & Allaire, J. C. (1999). Modeling computer interest in older adults: The role of age, education, computer knowledge, and computer anxiety. *Human Factors, 41*(345-355).

Ertmer, P. A., Addison, P., Lane, M., Ross, E., & Woods, D. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education, 32*(1), 54-72.

Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition and Emotion, 6*, 409-434.

Fletcher, W. E., & Deeds, J. P. (1994). Computer anxiety and other factors preventing computer use among United States secondary agricultural educators. *Journal of Agricultural Education, 35*(2), 16-21.

Fowler, F. J. (2002). *Survey research method* (3rd ed.). Thousand Oaks: Sage Publications, Inc.

Gardner, D. G., Discenza, R., & Dukes, R. L. (1993). The measurement of computer attitudes: An empirical comparison of available scales. *Journal of Educational Computing Research.*

Gardner, E., Render, B., Ruth, S., & Ross, J. (1985). Human-oriented implementation cures "cyberphobia". *Data Management, 11*, 29-32, 46.

Geisert, P. G., & Futrell, M. K. (1995). *Teachers, computers, and curriculum: Microcomputers in the classroom* (2nd ed.). Needham Heights, MA: Allyn and Bacon.

Gilroy, F. D., & Desai, H. B. (1986). Computer anxiety: Sex, race and age. *International Journal of Man-Machine Studies, 25*(6), 711-719.

Graham, J. (1993). How to refocus accounting content and methodology. *Business Education Forum, 48*(1), 30-33.

Hamid, A. S. A. (1993). *Malaysia's Vision 2020: Understanding the concept, implication and challenges.* Selangor, Malaysia: Pelanduk Publication (M) Sdn. Bhd.

Harrison, A. W., & Rainer, K. R. (1992). The influence of individual differences on skill in end-user computing. *Journal of Management Information System, 9*(1), 93-111.

Harrison, A. W., & Rainer, R. K. (1992). An examination of the factor structures and concurrent validities for the computer attitude scale, the computer anxiety rating scale, and the computer self-efficacy scale. *Educational and Psychological Measurement, 52*, 735-745.

Hedney, B. (1998). The professional development of teachers in an information technology era. *OUTPUT, 19*(1), 15-17.

Heinssen, R. K., Glass, C. R., & Knight, L. A. (1987). Assessing computer anxiety: Development and validation of the computer anxiety rating scale. *Computers in Human Behavior, 3,* 49-59.

Herdman, P. C. (1983). High tech anxiety. *Management Focus, 30*(3), 29-31.

Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology, 72*(2), 307-313.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1998). *Applied statistics for the behavioral sciences* (4th ed.). Boston, New York: Houghton Mifflin Company.

Hogan, D. P. (1994). Applied academics in accounting. *Business Education Forum, 48*(3), 35-37.

Howard, G. S., & Smith, R. D. (1986). Computer anxiety in management: Myth or reality? *Communication of the ACM, 29*(7), 611-615.

Igbaria, M., & Iivari, J. (1995). The effects of self-efficacy on computer usage. *Omega International Journal of Management Science, 23*(6), 587-605.

Igbaria, M., & Parasuraman, S. (1989). A path analytic study of individual characteristics, computer anxiety, and attitudes towards microcomputers. *Journal of Management, 15*(3), 373-388.

Karsten, R., & Roth, R. M. (1998). The relationship of computer experience and computer self-efficacy to performance in introductory computer literacy courses. *Journal of Research on Computing in Education, 31*(1), 14-23.

Kelley, C. L., & Charness, N. (1995). Issues in training older adults to use computers. *Behavior and Information Technology, 14,* 107-120.

Lee, C., & Bobko, P. (1994). Self-Efficacy Beliefs : Comparison of Five Measures . *Journal of Applied Psychology, 79*(3), 3.

Mahar, D., Henderson, R., & Deane, F. (1997). The effects of computer anxiety, state anxiety, and computer experience on users' performance of computer based tasks. *Personality and Individual Differences, 22*(5), 683-692.

Marcoulides, G. A., & Wang, X. B. (1990). A cross-cultural comparison of computer anxiety in college students. *Journal of Educational Computing Research, 6*(3), 251-263.

Martin, B. L. (1998). *Computer anxiety levels of Virginia Cooperative Extension field personnel.* Unpublished Doctoral of Philosophy, Virginia Polytechnic Institute and State University, Blacksburg.

Maurer, M. W., & Simonson, M. R. (1984). *Development and validation of a measure of computer anxiety.* Paper presented at the Association for Educational Communications and Technology, Dallas, TX.

Maurer, T. J. (2001). Career-relevant learning and development, worker age, and beliefs about self-efficacy for development. *Journal of Management, 27*(2), 123-140.

McEwen, B. C. (1996). Teaching microcomputer software skills. *Business Education Forum, 50*(4), 15-20.

McInerney, V., McInerney, D. M., & Sinclair, K. E. (1994). Student teachers, computer anxiety and computer experience. *Journal of Educational Computing Research, 11*(1), 27-50.

McNulty, B. (1995). Educating students for the demands of the workplace. *Business Education Forum, 50*(2), 25-37.

McQueen, R. J., & Mills, A. M. (1998). *End user computing sophistication in a large health services organization.* Paper presented at the 1998 Information Resources Management Association Conference.

Meier, S. T. (1988). Predicting individual differences in performance on computer-administered tests and task: Development of the computer aversion scale. *Computers in Human Behavior, 4*(3), 175-187.

Miller, L. W. (1997). Computer integration by vocational teacher educators. *Journal of Vocational and Technical Education, 14*(1).

Ministry of Education Malaysia (MOE), (1999). The Malaysia smart school: An MSC flagship application, a conceptual blueprint. Retrieved January 15, 2006 from http://www.msc.com.my/smartschool/downloads/blueprint.pdf

Murphy, C. A., Coover, D., & Owen, S. V. (1989). Development and validation of the computer self-efficacy scale. *Educational and Psychological Measurement, 49,* 893-899.

Oetting, E. R. (1983). *Manual: Oetting's computer anxiety scale (COMPAS).* Ft. Collins, Colorado: Tri-Ethnic Center for Prevention Research, Colorado State University.

Oscarson, D. J. (1976). *Factors associated with vocational teacher proneness toward the adoption of innovations.* Unpublished doctoral degree, Virginia Polytechnic Institute and State University, Blacksburg.

Pallant, J. (2001). *SPSS survival manual : A step by step guide to data analysis using SPSS for Windows (Version 10).* Buckingham: Open University Press.

Pedhazur, E. J., & Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach*. NJ: Lawrence Erlbaum Associates Inc., Publishers.

Ray, N. M., & Minch, P. (1990). Computer anxiety and alienation: Toward a definitive and parsimonious measure. *Human Factors, 32*(477-491).

Redmann, D. H., Kotrlik, J. W., Harrison, B. C., & Handley, C. S. (1999). Analysis of business teachers' information technology needs with implications for teacher education. *NABTE Review, 26*, 40-45.

Reed, K., Doty, D. H., & May, D. R. (2005). The Impact of Aging on Self-efficacy and Computer Skill Acquisition. *Journal of Managerial Issues, 17*(2).

Reinen, I. J., & Plomp, T. (1993). Some gender issues in educational computer use: Results of international comparative survey. *Computer in Education, 20*(4), 353-365.

Rosen, L. D., Sears, D. C., & Weil, M. M. (1987). Computerphobia. *Behavior Research Methods, Instruments and Computers, 19*(2), 167-179.

Rosen, L. D., & Weil, M. M. (1990). Computers, classroom instruction and the computerphobic university student. *Collegiate Microcomputer, 8*(4), 257-283.

Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience and technophobia among public school teachers. *Computers in Human Behavior, 11*(1), 9-31.

Russell, M., Bebell, D., Dwyer, L. O., & Connor, K. O. (2003). Examining teacher technology use: Implication for preservice and in-service teacher preparation. *Journal of Teacher Education 54*(4), 297-310.

Savenye, W. C., Davidson, G. V., & Orr, K. B. (1992). Effects of an educational computing course on preservice teachers' attitudes and anxiety toward computers. *Journal of Computing in Childhood Education, 3*, 31-41.

Schmidt, B. J., & Kirby, M. S. (1995). Technology and the development of critical thinking skills. In N. J. Groneman (Ed.), *National Business Education Yearbook* (Vol. 33, pp. 32-39). Reston, VA: National Business Education Association.

Schunk, D. H. (1989). *Self-efficacy and cognitive skill learning* (3rd ed.). San Diego: Academic Press.

Seligman, M. E. P., Walker, E. F., & Rosenhan, D. L. (2001). *Abnormal Psychology*. New York: W. W. Norton & Company. Inc.

Stone, D. N., Arunachalam, V., & Chandler, J. S. (1996). Cross-cultural comparisons: An empirical investigation of knowledge, skill, self-efficacy and computer anxiety in accounting education. *Issues in Accounting Education, 11*(2), 345-376.

Torkzadeh, G., & Angulo, I. E. (1992). The concept and correlates of computer anxiety. *Behavior and Information Technology, 11*, 99-108.

Torkzadeh, G., & Koufteros, X. (1994). Factorial validity of a computer self-efficacy scale and the impact of computer training. *Educational and Psychological Measurement, 54*(3), 813-821.

Venkatesh, V., Morris, M. G., & Ackerman, P. L. (2000). A longitudinal field investigation of gender differences in individual. *Organizational Behavior and Human Decision Processes, 83*(1), 33-60.

Wang, L., Ertmer, P. A., & Newby, T. J. (2004). Increasing preservice teachers' self-efficacy beliefs for technology integration. *Journal of Research on Technology in Education, 36*(3), 231-250.

Wood, R., Bandura, A., & Bailey, T. (1990). Mechanisms governing organizational performance in complex decision-making environments. *Organizational Behavior and Human Decision Processes, 46*(2), 181-201.

Zakaria, Z. (2001). *Factors related to information technology implementation in the Malaysian Ministry of Education Polytechnics.* Unpublished Doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg.

Zhang, Y., & Espinoza, S. (1998). Relationship among computer self-efficacy, attitudes toward computers and desirability of learning computing skills. *Journal of Research on Computing Education, 30*, 420-432.

APPENDICES

APPENDIX A

Cover Letter for Pilot Study

Date: _____

Dear colleague,

PILOT STUDY OF COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS IN INTEGRATING COMPUTER TECHNOLOGY IN INSTRUCTION.

I am a PhD. candidate at Virginia Polytechnic Institute and State University, USA and a faculty member at the Faculty of Accountancy, UiTM, Shah Alam, Selangor, Malaysia. As part of my doctoral dissertation, I am conducting a pilot study to explore the computer anxiety and computer self-efficacy among accounting educators in integrating computer technology in instruction at UiTM, Malaysia.

You have been selected to participate in the pilot study, and I would really appreciate your completing the survey. The objectives of the pilot study are to:

1. determine if the English language used in the survey instrument could be easily understood,
2. identify any ambiguities within the questionnaire,
3. determine if there are any problems that the participants might encounter,
4. estimate the time to complete the survey, and
5. solicit any suggestions and comments.

I have enclosed a stamped addressed envelope for your convenience, or you may e-mail me your response: rembi@vt.edu.

Thank you for you assistance.

Sincerely,

Roslani Embi

APPENDIX B

Survey Questionnaire

SURVEY OF COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS

Part 1: Computer Anxiety Rating Scale

Direction: The questions ask how you feel about using computers. For each statement, please circle the appropriate number at the right that best describes your current belief, based on the following rating scale:

Rating Scale: 1 = Strongly disagree (*SD*) 2 = Moderately disagree (*MD*)
3 = Moderately agree (*MA*) 4 = Strongly agree (*SA*)

		SD	***MD***	***MA***	***SA***
1.	I feel insecure about my ability to interpret a computer printout.	1	2	3	4
2.	I look forward to using a computer on my job.	1	2	3	4
3.	I do not think I would be able to learn a computer programming language.	1	2	3	4
4.	The challenge of learning about computers is exciting.	1	2	3	4
5.	I am confident that I can learn computer skills.	1	2	3	4
6.	Anyone can learn to use a computer if they are patient and motivated.	1	2	3	4
7.	Learning to operate computers is like learning any new skill – the more you practice, the better you become.	1	2	3	4
8.	I am afraid that if I begin to use computers I will become dependent upon them and lose some of my reasoning skills.	1	2	3	4
9.	I feel that I will be able to keep up with the advances happening in the computer field.	1	2	3	4
10.	I dislike working with machines that are smarter than I am.	1	2	3	4
11.	I feel apprehensive about using computers.	1	2	3	4
12.	I have difficulty in understanding the technical aspects of computers.	1	2	3	4
13.	It scares me to think that I could cause the computer to destroy a large amount of information by pressing the wrong key.	1	2	3	4
14.	I hesitate to use a computer for fear of making mistakes that I cannot correct.	1	2	3	4
15.	You must be a genius to understand all the special keys contained on most computer keyboards.	1	2	3	4
16.	If given the opportunity, I would like to learn about and use computers.	1	2	3	4
17.	I have avoided computers because they are unfamiliar and somewhat intimidating to me.	1	2	3	4
18.	I feel computers are necessary tools in both educational and work settings.	1	2	3	4

Part 2: Computer Self-Efficacy Rating Scale

Direction: The following statements relate to your self-efficacy with computers. For each statement, please circle the appropriate number at the right that best describes your current belief, based on the following rating scale:

Rating Scale: 1 = Strongly disagree (*SD*) 2 = Moderately disagree (*MD*)
3 = Moderately agree (*MA*) 4 = Strongly agree (*SA*)

	I feel confident:	***SD***	***MD***	***MA***	***SA***
1.	Working on a personal computer.	1	2	3	4
2.	Getting software up and running.	1	2	3	4
3.	Using the users' guide when help is needed.	1	2	3	4
4.	Entering and saving numbers or words into a file.	1	2	3	4
5.	Exiting from the application software.	1	2	3	4
6.	Retrieving a data file to view on the monitor screen.	1	2	3	4
7.	Understanding terms relating to computer hardware.	1	2	3	4
8.	Understanding terms relating to computer software.	1	2	3	4
9.	Handling removable storage devices correctly.	1	2	3	4
10.	Learning to use a variety of application software.	1	2	3	4
11.	Learning advanced skills within a specific application software.	1	2	3	4
12.	Making selections from an on-screen menu.	1	2	3	4
13.	Using the computer to analyze numeric data.	1	2	3	4
14.	Using a printer to print out my work.	1	2	3	4
15.	Copying a disk.	1	2	3	4
16.	Copying an individual file.	1	2	3	4
17.	Adding and deleting information from a data file.	1	2	3	4
18.	Moving the cursor around the monitor screen.	1	2	3	4
19.	Writing simple programs for the computer.	1	2	3	4
20.	Using the computer to write a letter or essay.	1	2	3	4
21.	Describing the function of computer hardware (e.g. keyboard, monitor, disk drives, central processing unit).	1	2	3	4

I feel confident:		***SD***	***MD***	***MA***	***SA***
22.	Understanding the three stages of data processing: input, processing, output	1	2	3	4
23.	Getting help for problems in the computer system.	1	2	3	4
24.	Installing software correctly.	1	2	3	4
25.	Explaining why application software will or will not run on a given computer.	1	2	3	4
26.	Using the computer to organize information.	1	2	3	4
27.	Deleting files when they are no longer needed.	1	2	3	4
28.	Organizing and managing files.	1	2	3	4
29.	Troubleshooting computer problems.	1	2	3	4

Part 3: Computer Applications Usage

Direction: The following is a list of application software. For each of the item, please circle the appropriate number at the right that best describes the frequency of usage either as a tool to support instruction or taught students as part of the curriculum in the courses you taught during an academic year.

Rating Scale: 0 = Not Available (*NA*) 1 = Never (*N*) 2 = Sometimes (*S*)
3 = Often (*O*)) 4 = Always (*A*).

		N/A	***N***	***S***	***O***	***A***
1.	Word processing (e.g., Microsoft Word, Word Perfect)	0	1	2	3	4
2.	Spreadsheets (e.g., Excel, Lotus 1-2-3)	0	1	2	3	4
3.	Database (e.g., Access)	0	1	2	3	4
4.	Presentation software (e.g., PowerPoint)	0	1	2	3	4
5.	Simulations (e.g., models a specific environment/situation)	0	1	2	3	4
6.	Accounting software packages (e.g., UBS, MYOB, Accpac)	0	1	2	3	4
7.	Auditing software (e.g., IDEA, ACL)	0	1	2	3	4
8.	Enterprise resource planning (e.g., SAP, Navision)	0	1	2	3	4
9.	Electronic mail	0	1	2	3	4
10	Internet	0	1	2	3	4

Part 4: General Information

Direction: Please circle the appropriate response or answer the questions in the space provided.

1. What is your gender?

   1 Female 2 Male

2. What is your age? _____ years old.

3. What is your current academic rank?

   1 Junior Lecturer
   2 Lecturer
   3 Senior Lecturer
   4 Associate Professor
   5 Professor

4. Do you have any accounting professional certification (e.g. ACCA, CIMA, ICSA, MICPA)?

   1 Yes 2 No

5. What is your highest level of academic qualification?

   1 Professional degree
   2 Bachelor's degree
   3 Master's degree
   4 Ph.D.

6. How many years of teaching experience do you have as an accounting educator at the university/college level? _____ year(s)

7. What is the primary source of computer training you have had in the previous five (5) years?

   1 Self taught
   2 Attended formal training

8. How many hours have you attended formal training in the previous five (5) years? _____ hours

9. How many years have you used computers for any purpose? _____ year(s).

10. How many years have you used computers in your accounting instruction? _____ year(s).

THANK YOU.

APPENDIX C

Institutional Review Board Approval

Office of Research Compliance
Institutional Review Board
1880 Pratt Drive (0497)
Blacksburg, Virginia 24061
540/231-4991 Fax: 540/231-0959
E-mail: moored@vt.edu
www.irb.vt.edu

FWA00000572(expires 7/20/07)
IRB # is IRB00000667.

DATE: December 18, 2006

MEMORANDUM

TO: Patrick A. O'Reilly
Roslani Embi

FROM: David M. Moore

SUBJECT: **IRB Exempt Approval:** "Computer Anxiety and Computer Self-Efficacy Among Accounting Educators at UiTM, Malaysia" , IRB # 06-722

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of December 18, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.

2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

APPENDIX D

Instructions to Coordinators

Date: _____

Research Coordinator
Faculty of Accountancy
UiTM _____

Dear colleague,

Instructions to Research Coordinators
Computer Anxiety and Computer Self-Efficacy Survey

All research coordinators for the survey are to adhere to the following instructions at all times.

1. Enclosed are the following materials:
    a. A list of instructors among your faculty who have been selected to participate in this study. There should be _____names in the list.
    b. _____ packages of survey materials. Each package consists of:
        i. Computer Anxiety and Computer Self-Efficacy among Accounting Educators Survey (Pages 1 through 4).
        ii. Self-addressed return envelope.
    c. Timeline for conducting the survey.
    d. Non-respondents' summary form.

2. Each package is meant for the faculty whose name is on the list.

3. Please assign an identification code to each faculty member. The first two letters preceding each code will be used to identify the branch and the three-digit numbers will identify the participants for follow-up purposes.

4. To preserve confidentiality and anonymity, please **DO NOT** write the faculty member's name on any of the survey materials.

5. Coordinators are reminded **NOT** to imply or suggest to the respondents that they are expected or required to complete the survey. Respondents are allowed to withdraw at any time from the survey without penalty.

6. Please remind each respondent to seal the completed form in a provided envelope and to return it to the coordinator within fourteen (14) days.

7. Coordinators are reminded to only check the numbers of completed survey forms returned to you. **DO NOT** record respondent's names in any form.

8. Please e-mail me at rembi@vt.edu if you have any questions.

9. At the end of the sixth week, research coordinators must stop all data collection and fill in the non-respondents summary form.

10. All name lists with the identification codes must be destroyed after filling in the non-respondents summary form.

12. Coordinators are to mail all completed responses and the non-respondents summary form to the researcher at the given address below, not later than _____

Roslani Embi
Faculty of Accountancy
UiTM
40450 Shah Alam,
Selangor.

Thank you.

Yours truly,

Roslani Embi

APPENDIX E

Non-respondents Summary

Non-Respondents Summary

UiTM _____

Please record the number of non-respondent in the space provided.

1. Gender

   Male _____ Female _____

2. Levels of education

   1. Professional degree _____
   2. Bachelor's degree _____
   3. Master's degree _____
   4. Doctoral degree _____

3. Academic rank

   1. Junior Lecturer _____
   2. Lecturer _____
   3. Senior Lecturer _____
   4. Assoc. Professor _____
   5. Professor _____

Thank you.

APPENDIX F

Cover Letter to Faculty Members

Date: _____

Dear colleague,

Re: STUDY OF COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS IN INTEGRATING COMPUTER TECHNOLOGY IN INSTRUCTION.

I am a Ph.D. candidate at Virginia Polytechnic Institute and State University, USA and a faculty member at the Faculty of Accountancy, UiTM, Shah Alam, Selangor, Malaysia. As part of my doctoral dissertation, I am conducting a survey to explore the computer anxiety and computer self-efficacy among accounting educators in integrating computer technology in instruction at UiTM, Malaysia.

The attached survey is being sent to all accounting lecturers at UiTM, Malaysia. As a lecturer myself, I know it is hard to find the time to fill in a questionnaire. However, the data you will provide is crucial in order to obtain a clear understanding of the extent and nature of computer anxiety and computer confidence among accounting educators in integrating computer technology in instruction at UiTM. It may also be of value to administrators for their resource decisions and to those developing online learning in the future. The results may inform future technology endeavors.

Completion of the survey implies that you agree to participate in the study. Participation is completely voluntary. Be assured that the five-digit identification codes on the survey materials and the self-addressed return envelope will be used only to facilitate the follow-up of non-respondents by the research coordinator. The survey will take approximately 15 minutes to complete, and I certainly appreciate your taking the time to participate. I have enclosed a self-addressed envelope for your convenience. Please return your completed survey in the sealed envelope to me through the research coordinator, Mr./Madam _____ by _____. I will look forward to your response.

The confidentiality of your responses will be assured because the results of the study will be summarized. If you have any questions, please e-mail me at rembi@vt.edu., or you may contact my dissertation supervisor, Dr. Patrick A. O'Reilly at his e-mail address oreilly@vt.edu.

Thank you for your participation.

Sincerely.

Roslani Embi
1805 Whipple Dr., Apt. #27
Blacksburg, VA 24060
USA.

APPENDIX G

First Reminder Letter

To: Faculties of Accountancy, UiTM

From: Roslani Embi

Date: _____

Re: STUDY OF COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS IN INTEGRATING COMPUTER TECHNOLOGY IN INSTRUCTION.

A few days ago, Mr./ Madam. ……., coordinating on my behalf, delivered a computer anxiety and computer self-efficacy survey instrument to you. If you have not completed the survey or have lost the survey instrument, please take 15 minutes of your time to fill out the enclosed survey instrument returning it to the appointed research coordinator within one (1) week.

As I stated in my initial letter, you have been selected to participate in this study. This study is confidential. No individual responses will be revealed.

Thank your for your participation in this study.

Sincerely,

Roslani Embi

APPENDIX H

Second Reminder Letter

To: Faculties of Accountancy, UiTM

From: Roslani Embi

Date: _____

Re: STUDY OF COMPUTER ANXIETY AND COMPUTER SELF-EFFICACY AMONG ACCOUNTING EDUCATORS IN INTEGRATING COMPUTER TECHNOLOGY IN INSTRUCTION.

A few weeks ago Mr./ Madam. ……., coordinating on my behalf, delivered you a computer anxiety and computer self-efficacy survey instrument. If you have not completed the survey, please take 15 minutes of your time to fill out the survey instrument, and return it to the appointed coordinator within one (1) week.

As I stated in my initial letter, you have been selected to participate in this study. This study is confidential. No individual responses will be revealed

Thank your for your participation in this study.

Sincerely,

Roslani Embi

Appendix I

Frequency of Respondents by Age

Appendix I

Respondents Age

Age	Gender		Percent
	Female	Male	
25	1	0	.4
26	3	0	1.1
27	1	0	.4
28	3	3	2.3
29	6	1	2.7
30	12	2	5.3
31	7	3	3.8
32	8	3	4.2
33	10	3	5.0
34	19	4	8.8
35	16	5	8.0
36	10	4	5.3
37	9	1	3.8
38	9	6	5.7
39	3	0	1.1
40	4	3	2.7
41	9	2	4.2
42	5	0	1.9
43	8	4	4.6
44	6	4	3.8
45	11	3	5.3
46	6	4	3.8
47	2	2	1.5
48	5	4	3.4
49	4	4	3.1
50	4	3	2.7
51	1	1	.8
52	1	2	1.1
53	1	2	1.1
54	0	3	1.1
55	2	0	0.8
Total	186	76	100.0

Summary statistics Female
Mean = 37.8 Median = 36.0 Mode = 34 Std. Deviation = 6.6 Min = 25 Max = 55
Summary statistics Male
Mean = 40.9 Median = 40.5 Mode = 38 Std. Deviation = 7.6 Min = 28 Max = 54
Overall summary statistics
Mean = 38.7 Median = 37.0 Mode = 34 Std. Deviation = 7.0 Min = 25 Max = 55

Female *N* = 186, Male *N*= 76

Appendix J

Cross-Tabulation between Branch and Academic Rank

Appendix J

Cross-Tabulation between Branch and Academic Rank

	Academic Rank					
Branch Campus	Junior Lecturer	Lecturer	Senior Lecturer	Assoc. Prof.	Prof.	Total
Perlis	0.4% (1)	4.6% (12)	1.9% (5)	1.1% (3)	0.0% (0)	8.0% (21)
Kedah	0.0% (0)	2.7% (7)	1.1% (3)	0.0% (0)	0.0% (0)	3.8% (10)
Perak	0.8% (2)	7.6% (20)	0.8% (2)	0.4% (1)	0.0% (0)	9.5% (25)
Shah Alam	0.8% (2)	11.8% (31)	3.4% (9)	11.8% (31)	0.8% (2)	28.6% (75)
Melaka	1.5% (4)	6.1% (16)	2.3% (6)	0.8% (2)	0.0% (0)	10.7% (28)
Johor	0.8% (2)	7.6% (20)	1.1% (3)	0.4% (1)	0.0% (0)	9.9% (26)
Pahang	2.3% (6)	2.7% (7)	0.4% (1)	0.0% (0)	0.0% (0)	5.3% (14)
Terengganu	0.4% (1)	5.0% (13)	1.5% (4)	0.0% (0)	0.0% (0)	6.9% (18)
Kelantan	0.8% (2)	3.1% (8)	1.5% (4)	0.0% (0)	0.0% (0)	5.3% (14)
Sarawak	0.4% (1)	4.2% (11)	2.7% (7)	0.8% (2)	0.0% (0)	8.0% (21)
Sabah	0.8% (2)	2.3% (6)	0.0% (0)	0.8% (2)	0.0% (0)	3.8% (10)
Total	8.8% (23)	57.6% (151)	16.8% (44)	16.0% (42)	0.8% (2)	100.0% (262)

Appendix K

Respondents' Years of Teaching Experience

Appendix K

Respondents' Years of Teaching Experience

Number of years	Gender				Total	Percent
	Female	Percent	Male	Percent		
1	4	1.5%	1	0.4%	5	1.9%
2	6	2.3%	1	0.4%	7	2.7%
3	2	0.8%	3	1.1%	5	1.9%
4	10	3.8%	2	0.8%	12	4.6%
5	20	7.6%	7	2.7%	27	10.3%
6	17	6.5%	9	3.4%	26	9.9%
7	15	5.7%	2	0.8%	17	6.5%
8	8	3.1%	2	0.8%	10	3.8%
9	7	2.7%	1	0.4%	8	3.1%
10	22	8.4%	7	2.7%	29	11.1%
11	10	3.8%	5	1.9%	15	5.7%
12	5	1.9%	6	2.3%	11	4.2%
13	6	2.3%	1	0.4%	7	2.7%
14	4	1.5%	2	0.8%	6	2.3%
15	5	1.9%	2	0.8%	7	2.7%
16	4	1.5%	0	0.0%	4	1.5%
17	2	0.8%	0	0.0%	2	0.8%
18	6	2.3%	6	2.3%	12	4.6%
19	3	1.1%	2	0.8%	5	1.9%
20	10	3.8%	13	5.0%	23	8.8%
21	4	1.5%	0	0.0%	4	1.5%
22	5	1.9%	0	0.0%	5	1.9%
23	7	2.7%	1	0.4%	8	3.1%
26	2	0.8%	1	0.4%	3	1.1%
27	1	0.4%	0	0.0%	1	0.4%
28	0	0.0%	1	0.4%	1	0.4%
31	1	0.4%	1	0.4%	2	0.8%
Total	186	71.0%	76	29.0%	262	100%

Summary statistics Female
Mean = 10.9 Median = 10.0 Mode = 10 Std. Deviation = 6.5 Min = 1. Max = 31
Summary statistics Male
Mean = 12.2 Median = 11.0 Mode = 20 Std. Deviation = 6.8 Min = 1. Max = 31
Overall summary statistics
Mean = 11.3 Median = 10.0 Mode = 10 Std. Deviation = 6.6 Min = 1. Max = 31

Female *N* = 186, Male *N*= 76

Appendix L

Primary Source of Training and Number of Hours of Formal Training

Appendix L

Primary Source of Training and Number of Hours of Formal Training

	Primary Source of Training			
	Self-taught		Formal Training	
Number of hours	*N*	*%*	*N*	*%*
No response	42	25%	0	0.0%
0	16	9%	0	0.0%
4	2	1%	0	0.0%
5	1	1%	0	0.0%
6	3	2%	0	0.0%
8	38	22%	0	0.0%
10	31	18%	1	1%
12	5	3%	0	0%
14	1	1%	0	0%
15	1	1%	0	0%
16	8	5%	2	2%
20	13	8%	2	2%
22	2	1%	0	0%
24	3	2%	7	8%
25	1	1%	0	0%
30	4	2%	4	4%
32	0	0%	6	7%
36	0	0%	2	2%
38	0	0%	1	1%
40	0	0%	13	14%
48	0	0%	8	9%
50	0	0%	6	7%
55	0	0%	1	1%
60	0	0%	14	15%
64	0	0%	1	1%
70	0	0%	4	4%
72	0	0%	1	1%
80	0	0%	5	5%
84	0	0%	1	1%

Appendix L (continued)

Primary Source of Training and Number of Hours of Formal Training

	Primary Source of Training			
	Self-taught		Formal Training	
Number of hours	*N*	*%*	*N*	*%*
100	0	0%	5	5%
120	0	0%	1	1%
140	0	0%	1	1%
150	0	0%	2	2%
200	0	0%	3	3%
Total	171	100.0%	91	100.0%

Summary statistics self-taught					
Mean = 12.2	Median = 10.0	Mode = 8.0	Std. dev. = 6.0	Min = 4.0	Max = 30.0
Summary statistics attended formal training					
Mean = 58.6	Median = 48.0	Mode = 60.0	Std. dev. = 38.2	Min = 10.0	Max = 200
Overall summary statistics					
Mean = 32.9	Median = 20.0	Mode = 8.0	Std. dev. = 34.7	Min = 40.0	Max = 200.0

Note: Overall summary statistics and summary statistics for self-taught exclude respondents who did not report any hours of formal training.

Appendix M

ANOVA of Computer Anxiety with Selected Variables

Appendix M

ANOVA of Computer Anxiety with Selected Variables

Variable	B	SE	β	t	Sig
1. Gender	-.220	.844	-.016	-.260	.795
2. Age	-.023	.055	-.026	-.417	.677
3. Do you have a professional degree?	-.745	1.003	-.046	-.743	.458
4. Primary source of computer training	-.418	.802	-.032	-.521	.603
5. Number of hours attended formal training	-.011	.012	-.064	-.910	.364
6. Number of years using computers.	-.082	.106	-.048	-.779	.437
7. Location category	-.925	.837	-.068	-1.106	.270

Note:

1. R = 0.16	R^2 = .000	F = .068,	p > .10
2. R = 0.26	R^2 = .001	F = .174	p> .10
3. R = .046	R^2 = .002	F = .552	p > .10
4. R = .032	R^2 = .001	F = .272	p > .10
5. R = .064	R^2 = .004	F = .829	p > .10
6. R = .048	R^2 = .002	F = .607	p > .10
7. R = .068	R^2 = .005	F = 1.223	p > .10

Appendix N

Cross-Tabulation between Computer Applications Usage With Gender

Appendix N

Frequency Usage of Computer Application by Gender

	Gender					
	Female			Male		
Types of Computer Application	Not Available	Never used	Used	Not Available	Never used	Used
Word Processing	0 0.0%	0 0.0%	186 100.0%	0 0.0%	0 0.00%	75 100.0%
Spreadsheet	0 0.0%	0 0.00%	185 100.0%	0 0.0%	0 0.0%	76 100.0%
Internet	0 0.0%	4 2.2%	182 97.8%	0 0.0%	5 6.6%	71 93.4%
Electronic mail	0 0.0%	10 5.4%	176 94.6%	0 0.0%	8 10.5%	68 89.5%
Presentation	0 0.0%	5 2.7%	181 97.3%	0 0.0%	3 3.9%	73 96.1%
Accounting software	0 0.0%	60 32.3%	126 67.7%	0 0.0%	21 27.6%	55 72.4%
Databases	0 0.0%	91 48.9%	95 51.1%	0 0.0%	30 39.5%	46 60.5%
Simulation	0 0.0%	109 58.6%	77 41.4%	0 0.0%	43 56.6%	33 43.4%
Auditing	85 45.7%	85 45.7%	16 8.6%	21 27.6%	36 47.4%	19 25.0%
Enterprise resource planning	86 46.2%	82 44.1%	18 9.7%	33 43.4%	31 40.8%	12 15.8%

Female $N = 186$ Male $N = 76$

Appendix O

Cross-Tabulation between Computer Applications Usage With Gender and Age Categories

Appendix O

Frequency Usage of Computer Applications by Age Categories

Types of Computer Application	Younger Adults			Middle-aged Adults		
	Not Available	Never used	Used	Not Available	Never used	Used
Word Processing	0 0.0%	0 0.0%	152 100.0%	0 0.0%	0 0.0%	110 100.0%
Spreadsheet	0 0.0%	0 0.0%	151 100.0%	0 0.0%	0 0.0%	110 100.0%
Presentation	0 0.0%	4 2.6%	148 97.4%	0 0.0%	4 3.6%	106 96.4%
Internet	0 0.0%	4 2.6%	148 97.4%	0 0.0%	5 4.5%	105 95.5%
Electronic mail	0 0.0%	7 4.6%	145 95.4%	0 0.0%	11 10.0%	99 90.0%
Accounting software	0 0.0%	36 23.7%	116 76.3%	0 0.0%	45 40.9%	65 59.1%
Databases	0 0.0%	76 50.0%	76 50.0%	0 0.0%	45 40.9%	65 59.1%
Simulation	0 0.0%	90 59.2%	62 40.8%	0 0.0%	62 56.4%	48 43.6%
Auditing software	59 38.8%	72 47.4%	21 13.8%	47 42.7%	49 44.5%	14 12.7%
Enterprise resource planning	66 43.4%	65 42.8%	21 13.8%	53 48.2%	48 43.6%	9 8.2%

Younger Adults; $N = 152$ Middle-aged Adults; $N = 110$

CURRICULUM VITAE

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Master of Science in Accounting, December 1994
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Bachelor of Science in Accounting, July 1987.
Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

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WORKING EXPERIENCE

July 1988 – 2003	*Lecturer* Faculty of Accountancy Universiti Teknologi MARA 40200 Shah Alam, Selangor, Malaysia.
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TEACHING EXPERIENCE

Courses Taught:

1. Accounting Information System
2. Computerized Accounting
3. Financial Accounting
4. Financial Management
5. Auditing

CONSULTANCY

1. Committee member in evaluating project proposal under Intensive Grant Scheme with Ministry of Science, Technology and Environment, Malaysia, 2002-2003.

2. Conduct computerized accounting training to accounting lecturers in Universiti Teknologi Mara, Kuching, Sarawak, Malaysia., 2000

3. Financial Accounting Workshop 2, Auditor General, Kuala Lumpur, Malaysia, 1998.

4. Financial Accounting Workshop 1, Auditor General, Kuala Lumpur, Malaysia, 1996.

5. Setting up computerized accounting system at D.G. Com, Subang Jaya, 1996.

6. Setting up computerized accounting system at Advance Finance in Kuching, Sarawak, Malaysia, 1995

7. Conducted Accpac Plus Computerized Accounting Workshop to accounting lecturers at Politeknik Kuching, Sarawak, 1995.