A Study to Determine Whether Age is a Factor in the Apprehension of Students to Use Computers at Southwest Virginia Community College

Delilah T. Long
Old Dominion University

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A STUDY TO DETERMINE WHETHER AGE IS A FACTOR IN THE
APPREHENSION OF STUDENTS TO USE COMPUTERS AT SOUTHWEST
VIRGINIA COMMUNITY COLLEGE

A Research Paper
Presented to the Graduate Faculty of
the Department of Occupational and Technical Studies
at Old Dominion University

In Partial Fulfillment
of the Requirements for the
Master of Science Degree

By
Delilah T. Long
April 2001
This research paper was prepared by Delilah T. Long under the direction of Dr. John M. Ritz in OTED 636, Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Occupational and Technical Studies.

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4-16-01
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Delilah T. Long
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CHAPTER I
INTRODUCTION

According to Joseph Weinberg, a psychologist at the University of Pittsburgh, one-third of all individuals are "cyberphobic" and are afraid of using computers (Zemke, 1984, p. 35). Researchers Rosen and Weil agree, "stating that one third of all college students experience some form of technophobia" (DeLoughry, 1993, p. A25). Rosen and Weil believe that students with this phobia perform well in college using blackboards in the classrooms and card catalogs in the library, but struggle when faced with using technology in the classroom setting (DeLoughry, 1993).

Students have unrealistic fears about technology and these fears may force them to abandon their academic and career goals by avoiding technology. Computers have become an integral part of our lives, and nowhere is this more evident than in a community college setting. At Southwest Virginia Community College, computer interaction is an integral part of almost every academic major. Instructors in many of the disciplines require Internet assignments, use of e-mail and other forms of computer technology on a daily basis. For the middle age adult learner this experience can be overwhelming.

Thomas McDonald, a clinical psychologist, states that his entire practice is built around people experiencing "techno-stress". Symptoms range from feeling vague discomfort with change to specific anxieties about being left behind and outperformed by younger, more technological advanced individuals (Zemke, 1984, p. 35). Individuals who fail to master computers are at a disadvantage for mainstream employment opportunities.
STATEMENT OF THE PROBLEM

The problem of this study was to determine whether age is a factor in the apprehension of students to use computers at Southwest Virginia Community College.

RESEARCH GOALS

The following objectives were identified to guide this research:

1. Identify whether students have access to computers outside the college.
2. Identify whether students have access to the internet outside the college.
3. Identify whether students’ age increased their apprehension to use computers to support their course work.
4. Identify whether courses surveyed required computer knowledge and skills.

BACKGROUND AND SIGNIFICANCE

This study originated as a result of the observation that many Southwest Virginia Community College students had difficulty adapting to computer use. The need to study computer apprehension was supported in the literature. This study surveyed student’s opinions about anxieties they felt when working with computers. This study also sought to recommend prevention and instructional strategies that could facilitate anxiety free learning. This information can be useful for any instructor using computer-based instruction at Southwest Virginia Community College.

Southwest Virginia Community College, a post-secondary educational institution is part of the Virginia Community College System (VCCS), is located in Richlands, Virginia. Educational programs are offered so students may obtain diplomas, certificates
or associate degrees. The average age of the student attending SVCC is twenty-eight years of age.

The diversity of the student population regarding age and prior experience is as unique as the area served. Located in the heart of Appalachia, SVCC serves an area that is predominantly rural. Counties served by SVCC include Buchanan, Dickenson, Russell and Tazewell counties. All of the counties are typical of Appalachian culture and lifestyles. The mountainous terrain geographically isolates this region of 1800+ square miles. Further, there are no interstate highways (and only two four-lane highways) traversing the Cumberland Plateau.

Statistics show that the average per capita income in 1997 for the four counties served by SVCC ranged from $14,583 in Dickenson County to $17,065 in Tazewell County, as compared to the state’s average of $25,255. According to the latest survey of graduates of Southwest Virginia Community College, the average salary of college graduates was less than $23,000 per year.

Data from the Cumberland Plateau Planning District Commission (1997) show the following statistics for the rural Appalachian counties served by Southwest Virginia Community College (SVCC). Of the population over the age of 25, one-fourth (25%) have completed less than five years of public school and less than one-half (50%) have completed high school. Only five percent (5%) of the population had obtained an associate degree and only four percent (4%) a bachelor’s degree. These numbers are even less when looking at more advanced degrees.

According to a report published by the U.S. Department of Commerce, over 60% of people with college degrees now use the Internet, compared to less than 7% of those
with an elementary school education or less. Households with incomes of $75,000 or more are nine times more likely to have a computer at home and 20 times more likely to have access to the Internet than those at the lowest income levels.

According to the 1990 U.S. Census data, thirty percent (30%) of the households in Southwest Virginia are single parent households, and twenty-three percent (23%) are single parent households headed by females. This disparity adds to the low number of families in the region who own or have access to Internet services.

Area government representatives and educators estimate that less than twenty percent (20%) of the area’s population own computers and less than ten percent (10%) have on-line access (King, 1999, p. 1). Students lacking access to computers and the Internet are at a disadvantage to their peers that have access to technology. Students who have never used computers are often afraid of technology.

The importance of this research was to determine how instructors can decrease computer apprehension among older students. The researcher believes that computer classes should be a prerequisite for courses requiring the use of Internet, e-mail and other forms of technology.

LIMITATIONS

The study was limited to investigating students’ opinion at Southwest Virginia Community College. The study separated the student responses indicating those having access to computers outside the college from those indicating no access to computers outside the college. Reliability of findings will depend upon adequate return of
questionnaires, and the quality of the questionnaire items. In this research, several other limitations were made regarding the problem being studied.

1. This study was limited to students at Southwest Virginia Community College.
2. This study was limited to students over the age of 18 years.
3. This research did not include every class and instructor at Southwest Virginia Community College.
4. This research was limited to the Spring 2001 classes.

ASSUMPTIONS

This study was conducted assuming that there were students who had access to computers outside the college and those that had no access to computers outside the college. The study assumed there were different levels of apprehension and areas of difficulty for students who indicated no access to computers compared to those indicating access.

The study further assumed there were a number of students who were afraid of computers and technology. Also, the researcher assumed participants’ responses to questionnaire items were based on their “real” or “true” feelings. Another assumption is that computer apprehension increased with age among students at Southwest Virginia Community College.

PROCEDURES

The descriptive method of research was used to gather and analyze the data necessary for the study of this problem. Research data were collected from Southwest
Virginia Community College students attending spring 2001 semester classes. A survey was conducted to obtain opinions from primary sources. Research data were collected through a survey distributed to students at random. The respondents answered questions concerning their self-perceived apprehension when required to use computers. The survey also questioned the respondents about their perceived ability to use computers and how they assessed their computer skills. The survey questioned the students on their gender and age (older students over age 55 and younger students under age 30).

The researcher asked the instructors about the use of computers and software in the classroom and if any Internet-based assignments were required. This provided information about the technology skill requirements of the students for a specific course. A correlation was performed to determine if a relationship existed between student’s age and computer anxiety.

**DEFINITION OF TERMS**

For the purposes of this research, key terms and concepts are defined to assist in the understanding and use of this study. These include:

1. **Anxiety** - A state of intense apprehension, uneasiness, uncertainty, or fear resulting from the anticipation of a threatening event or situation, often to a degree that the normal physical and psychological functioning of the affected individual is disrupted.

2. **Anxious Technophobia** - Exhibits the classic signs of anxiety reaction when using technology: sweaty palms, heart palpitations, headaches.

3. **Apprehension** - Suspicion or fear.
4. **Cognitive Technophobia** - On the surface is calm and relaxed, but internally is consumed with negative messages: “Everybody can do this, why can’t I” or “I’ll hit the wrong button and lose everything”.

5. **Computer anxiety** - Fear of impending interaction with a computer that is disproportionate to the actual threat presented by the computer.

6. **Computerphobic** - Fear or dread of computers; hostile or aggressive thoughts about computers.

7. **Cyberphobic** - Afraid of using computers.

8. **Full-time student** - Student taking twelve (12) credit hours of course work.

9. **SVCC** - Southwest Virginia Community College. This is the location that the researcher studied. The community college is located in Richlands, Virginia.

10. **Technology** - Knowledge, methods and activities used to achieve a practical purpose.

11. **Technology competency** - The ability to use computer technology to meet one’s information needs.

12. **Technophobia** - Fear of technology.

13. **Technostress** - An inability to cope with the new computer technologies in a healthy manner.

14. **Uncomfortable User** - Computer user may be anxious or have negative thoughts, but generally are not in need of one-on-one counseling.

15. **VCCS** - Virginia Community College System.
OVERVIEW OF CHAPTERS

Chapter I acknowledged the problem of this study. The goal of this research was to provide more information about computer apprehension in relationship to age. Instructors need to be aware of the effects of computer anxiety. The middle age adult learner can find computers overwhelming. The research focused on computer apprehension among students at Southwest Virginia Community College.

The background and significance section explained where the problem came from and its importance to understanding the technology apprehension among college students. The procedures for the data collection were described from which the survey responses and observation of data should be compared to illustrate how computer apprehension related to age. Terms that may be unclear to the reader or had special meaning within the context of the study were defined.

Chapter II, Review of Literature, analyzes the pertinent studies that have been done on the research topic. In consideration of how opinions alter the review of such topics, the review of existing literature was essential. Chapter III offered an explanation of the procedures used to collect data that were presented as the new information and data discovered in Chapter IV. Chapter IV, Findings, will provide the analysis and results of the study. Finally, Chapter V summarized this research study. Conclusions are stated and recommendations are suggested in this final chapter.
CHAPTER II

REVIEW OF LITERATURE

This review of literature reviewed current research findings related to computer anxiety. In an attempt to do this efficiently and accurately, and to make sense of the vast body of literature, a review of literature was conducted to properly analyze what has been learned in this area over the past two decades.

Results of many studies exploring age (Laguna & Bobcok, 1997; Meier & Lambert, 1991; Gordon, 1993) and computer experience (Gos, 1996; Szajina, 1994; Leso & Peck, 1992) demonstrate contradictions and inconsistencies. Much of the literature that attempts to correlate computer anxiety with variables such as age and experience appear to be inconsistent and contradictory.

This chapter will review (1) computers in education, (2) computer anxiety, (3) symptoms of computer anxiety, (4) measuring computer anxiety, (5) students’ technology competency requirements for SVCC, and (6) faculty computer training at SVCC.

COMPUTERS IN EDUCATION

It has been almost thirty years since computers were first introduced into education for teaching and learning. Today the computer is part of everyday life, and nowhere is this more evident than in a college setting. At SVCC, computer interaction is an integral part of almost every academic major.

As the academic and business environments continue to implement computer technology, the gap is widening for individuals experiencing computer anxiety. Students
with computerphobia are being left behind. In today’s society, students must have sufficient technological literacy to be able to prepare for a lifetime of computer use and life-long learning. Educators are challenged to make students employable and to use computer technology to achieve educational excellence.

Successful integration of computer technology in the classroom begins with the instructor’s competency in using the desired technology. According to Ford, instructors that use educational technology in their teaching and require students to use it for assignments greatly further student proficiency with technology (Ford, 1997, p. 15).

According to the 1999 *Learning Technology Skills and Technology BASICS Program Checklist* at Southwest Virginia Community College, SVCC is a “state-of-the-art technology center for students, faculty and staff.” Faculty and students are encouraged to utilize computer technology as part of the instructional process.

With the increase in computer technology, instructors must be aware of the positive and negative reactions of students to using computers. Students’ attitudes about using computers are crucial to the learning environment.

To enter the “Information Age,” community colleges are going to have to move forward. According to one author, the typical community college system exists in the “Late Industrial Era.” To allow for the effective use of technologies and information, changes must be made to the rigid traditional organizational structures (Henriksen, 1998, p. 93).

The role of computer technology should be to support efforts to reach the learners (Boettcher, 1999, p. 18). The instructor should identify computer anxious students and provide early interventions and a slow paced atmosphere to help ease anxiety
(DeLoughry, 1993). Research indicates that individuals that start slow have less anxiety when dealing with computers.

**COMPUTER ANXIETY**

According to Rosen and Weil (1990), technophobic individuals may experience anxiety and discomfort. Individuals that are computer anxious may experience fear of the unknown, feel frustrated, embarrassed, and may experience failure and disappointment. They may avoid technology and tend to make more errors and mistakes than their counterparts. Also, they tend to have a higher absenteeism rate than those less apprehensive.

An article in the Wall Street Journal (1993) demonstrated the effects of technophobia. Dell Corporation conducted a poll, surveying 1,000 adults. The results found that 23% of those surveyed were uncomfortable using computers. Everyone surveyed indicated they were technophobic to a degree.

Research conducted by Carol R. Glass and Luanne A. Knight studied the relationship between computer anxiety and the characteristics of the individuals experiencing technostress and found that the students who were highly anxious about computers also had negative thoughts about doing work on a computer. They also had low expectations about their ability to perform tasks (Glass & Knight, 1998).

Research suggests that computer apprehension can be a barrier to student achievement within an adult learning environment. In another survey, fifty-five percent of individuals surveyed classified themselves as "technophobes." The attitude of others
indicated that they do not mind that the rest of the world passes them by as long as they can still earn a living (TechnoMania, 1995).

Many researchers have defined computer anxiety and much has been done in the study of factors correlated with computer anxiety, such as age, gender, race and experience. The research of Rosen and Weil indicated that there is no consistent relationship between age and computerphobia (1990, p. 277). Another meta-analysis of 81 research reports on computerphobia concluded that computer anxiety is not significantly related to either age or gender (Rosen & Maquire, 1990).

Research conducted by Laguna and Babcock (1997) found that older adults had more computer anxiety than younger adults. In a similar study conducted by Dyck and Smither, older participants were found to be more anxious about using computers than were younger participants (Ellis & Allaire, 1999, p. 345). This research supports prediction that age would be negatively correlated with computer knowledge and positively correlated with computer anxiety. Many researchers come to different conclusions about computer anxiety in different studies, rendering the reader unable to make meaningful conclusions about computer anxiety. Most researchers agree that computer experience alone does not eliminate or alleviate computer anxiety (Rosen & Maguire, 1990). Individuals that use computers weekly may continue to exhibit signs of anxiety.

A study of 300 managers in the Philadelphia area, conducted by the Bureau of Business Practice, found that one-third of the managers had negative feelings toward computers and five percent exhibited physical symptoms when near computers (Hall-Sheehy, 1986, p. 41).
SYMPTOMS OF COMPUTER ANXIETY

Individuals experiencing computer anxiety often experience symptoms such as headaches, muscle tension, eye strain, sweaty palms, heart palpitations and a rapid heart rate. Other symptoms include feelings of frustration, negative attitudes about computers and feeling of indifference. Some individuals experience symptoms such as restlessness and wandering mind (Rosen & Weil, 1990). There are numerous instruments used to measure computer apprehension. The following section will discuss instruments used in measuring computer anxiety.

MEASURING COMPUTER ANXIETY

A large portion of the literature has focused on developing, validating, and refining instruments that measure computer anxiety. There are numerous computer anxiety instruments that exist. The Computer Anxiety Rating Scale (CARS-C), Computer Thoughts Survey (CTS-C), and General Attitudes Toward Computers Scale (GATCS-C) are the most common.

Other instruments are comprised of written statements about potentially anxiety-causing situations related to computer use. Most instruments use a Likert scale where the respondents report the extent to which they agree or disagree with these statements to determine their relative, self-reported anxiety level when dealing with computers.

Many of the studies examined in this review used instruments that were five to ten years old. Changes in computer technology occur fairly rapidly, as evidenced by the differences between mainframe computers of the 70s and the laptop or palm-sized computers of late 1990s. Thus the older instruments the literature uses to gauge
computer anxiety may not be able to account for all anxiety-inducing elements that are applicable to computer technology that exists today.

The instruments that are used to measure computer anxiety often measure one aspect of a multi-faceted construct (Gos, 1996). Some researchers attempt to develop their own computer anxiety measurement instruments, designing them for a particular population of interest, such as beginning adult users in a university setting (McInerney, McInerney & Roche, 1994).

Southwest Virginia Community College has written a competency requirement checklist for students attending the community college. Students are expected to know how to use computers because computers are an integral part of education within the community college. The technology competency requirements are discussed in the next section.

STUDENTS' TECHNOLOGY COMPETENCY REQUIREMENTS

A Title III grant funded in 1998 enabled SVCC to create a new staff position, Instructional Design Technician. This staff member was responsible for outlining specific technology competency requirements for each of the college’s curriculum programs.

Michael Brown, Instructional Design Technician, identified the following required competencies in his 1999 Technology Competency Report. There are three general categories of students’ technology competency requirements: (1) general computer knowledge, (2) information literacy, and (3) computer management. General computer knowledge is the ability to “demonstrate a working knowledge of computing
concepts, components, and operations to accomplish educational and career tasks.” Individuals that lack computer experience are at a disadvantage.

The information literacy competency is using the Internet to access and apply information from on-line catalogs, virtual libraries, and the World Wide Web. The student should be able to “read and use computer information critically and analytically” and have an understanding of the ethical use of computer information and resources. Computer management is effectively using the basic features of “an operating system to manage the computer and files” (Brown, 1999, p. 1).

Many Southwest Virginia Community College students are exposed to a variety of computer functions. Most programs require assignments to be completed using computer skills and students are beginning to demonstrate more competencies in using computers. There are also competency requirements for using electronic communication and the World Wide Web. In many classes, students are required to send and receive email and include attachments (King, 1999, p. 3).

In order to stay abreast of changes in technology and to assist students in becoming technologically competent, faculty and staff are encouraged to take classes and training in various computer software. The following section discusses faculty computer training at SVCC.

FACULTY COMPUTER TRAINING AT SVCC

Technology changes at such a fast rate that many people have a hard time keeping up. Southwest Virginia Community College understands the need to stay abreast of current changes in technology and has a flexible infrastructure that is “adaptable to
change and has empowered its people to use the technology in their teaching or their administrative duties” (1999, p. 2).

Committees have been established to increase the awareness of software programs available for instruction and training to use the technology. The Teaching, Learning and Technology Roundtable (TLTR) facilitates opportunities for faculty and staff to participate in technological learning activities.

Technology training is also supported by the Professional Development Committees and through classes offered to faculty and staff by the College. The Professional Development Committee is responsible for determining what types of training is needed and to provide training updates.

Technology support services should be able to provide assistance to both individuals and groups in the use of various education technologies (Ford, 1997, p. 14). Instructors experience some of the same anxieties as students when learning new technological skills. Instructors receiving technological training and support are better able to provide instruction to their students.

**SUMMARY**

This chapter focused on computer anxiety in the adult learner. There were contradictions and inconsistencies among different studies and researchers. The research studies reviewed sought to identify computer anxiety, but they did not identify many causes of anxiety. The studies that did look at anxiety variables included gender, race, age levels and previous computer experience.
Another inconsistency was the definition for computer anxiety. There did not appear to be a concise definition of the term "computer anxiety" among researchers. Most researchers defined computer anxiety based on the symptoms that the individual exhibited.

Instruments used to measure computer anxiety were found to be five to ten years old. Computer technology has changed drastically in the past five to ten years, and it may be that these instruments are outdated. The older instruments the literature uses to gauge computer anxiety may not be able to account for all elements that are applicable to computer technology that exists today.

From extensive research, there are indications that additional research needs to be done with computer anxiety. Additional research needs to look at more specific independent variables of computer anxiety and ways to alleviate computer anxiety in individuals exhibiting high anxiety levels.

Southwest Virginia Community College has a written policy regarding students' technology competency and it has been developed into a checklist. Students need to have access to this policy and know that the policy exists. Instructors need to stay abreast of changing technology in order to better facilitate technology in the classroom.

The next chapter will explain the instruments; and the methods and procedures used to collect the data used in this study. The population will be identified and an explanation of the compiling and analysis of data will be provided.
CHAPTER III
METHODS AND PROCEDURES

Chapter III describes the methods and procedures used in collecting data necessary for this research. The chapter includes a description of the population and a description of the instrument design used in gathering the data and how it was constructed. The procedures used for collecting and treating the data will also be described.

DESCRIPTION OF POPULATION

The population of this study involved students enrolled at Southwest Virginia Community College. A questionnaire was randomly distributed to students attending SVCC to examine the relationship between computer anxiety and computer access for older (over 20) and younger (under 20) adults. Data were collected from 75 subjects using a computer anxiety rating scale. Both male and female students participated in the survey. The study reported separately the responses from the students indicating access to computers outside the college and those indicating no computer access outside the college. Studies have indicated that the more exposure a person had to computers, the less anxious they became. The population surveyed was between 18-78 years of age.

INSTRUMENT DESIGN

The instrument utilized in this study was in the form of a questionnaire. The survey was designed so that as little writing as possible would be required. The introduction to the questionnaire explained the purpose and use of the questionnaire
responses. For background purposes and to better define the audience, respondents were asked to indicate his/her gender, race and age. Names were not sought.

The questionnaire also solicited a response concerning access to computers outside the college and those students that had no access to computers outside the college. The respondents were asked to answer yes or no to having had computer access and to answer whether the computer access was at home, work or other. To better clarify his/her response of yes, the students were asked to explain their response and give examples such as high school, work, home, etc. The students were asked to evaluate his/her level of computer anxiety on a five-point Likert scale with one being not at all and five being very much. As indicated previously, data from students indicating computer access outside the college were tabulated separately.

Rosen and Weil designed the computer anxiety rating scale (CARS) instrument along the lines of the Mathematics Anxiety Rating Scale (MARS; Richardson & Suinn, 1972). A pool of items were created to reflect a variety of aspects and features of technological anxiety, including anxiety about machines themselves, their role in society, computer programming, computer use, use of technology, problems with computers and technology and computers in the media. These items were presented to judges to assess face and content validity. The judges included professors who regularly teach courses using computers as an adjunct to their lectures as well as consumers who regularly use a variety of technological devices.

The initial validation study was undertaken Fall of 1983 by Dr. Larry Rosen. The purpose of this study was to administer the CARS to a sample of university students who were not currently taking a course using computers and assess their validity and
reliability. Two psychology courses were used to provide a sample of 84 students. The instrument used was appropriate for measuring anxiety about computers and all computerized technology. The survey has a readability of 10.0 and has been administered successfully to children as young as 11 years old and adults of all ages.

The instrument used to evaluate computer anxiety among students attending SVCC was the Computer Anxiety Rating Scale (CARS-C). The CARS-C contains 20 items that measure computer anxiety on a five-point scale. This measurement instrument has been administered to thousands of university students, teachers, secondary schools students and business people throughout the United States and university students in 22 other countries. The Computer Anxiety Rating Scale surveys were developed by Dr. Larry D. Rosen with California State University and Dr. Michelle M. Weil with Chapman University. To date, 14 studies have been completed with thousands of university students, elementary and secondary school teachers, business people and secondary school students. The CARS (Form C) are quite reliable with all alpha coefficients above .80. A copy of the survey questionnaire, Appendix B, is included in the Appendices section of this research document.

METHODS OF DATA COLLECTION

In order to collect the data, the researcher requested permission from instructor’s at random to see if they would allow their students to participate in the research project. A personal phone call was made to the instructor, and a time and date were scheduled. The survey questionnaire was distributed by the researcher during the spring 2001 semester and were collected on the same day. A convenient time was arranged with each
instructor agreeing to participate. The researcher called each instructor prior to the date agreed upon to confirm the survey appointment time. Once the instructor granted permission to allow their students to participate in the survey, the researcher explained the purpose and procedures of the survey to the students. The researcher personally conducted the research survey in each class. All participants were given written and oral instructions about how to complete the survey questionnaire. If the participants did not volunteer, they were not required to participate. Individuals that participated in a prior survey were instructed not to participate again. Additionally, names were not required on the survey/instrument package.

The students who volunteered to participate were given the survey/instruments to complete, which averaged approximately ten to fifteen minutes per person. This study measured the self-reported computer anxiety levels of 75 community college students. The researcher collected the completed surveys and thanked both the instructor and students for their participation.

STATISTICAL ANALYSIS

The data collected from the surveys were entered into the SPSS program in which the statistical functions were used to determine the profiles of each statement. The data responses for gender and age level were provided to better define the problem. A five-point Likert scale was used to obtain information regarding levels of anxiety. The range on the Likert scale was from one (indicating not at all) to five (indicating very much).

The total number of each individual response and the total for each statement was calculated. The overall totals were tabulated as well as the percentage of the population selecting each Likert category. All questionnaire items were tabulated separately for
students with no access to computers outside the college and those with computer access outside the college. The data were then used to perform calculations to determine the mean and the standard deviation.

The responses for each question were compiled and tabulated to provide the information regarding each student’s attitude toward computers. The responses also indicated their computer anxiety and whether the students had computer access at school, work and home. The percentages and number of responses for each question were calculated and recorded. Individuals indicating access to computers outside the college and those indicating no access to computers outside the college were tabulated using the t-test. The t-test was also used for individuals indicating computer anxiety versus little or no computer anxiety. A correlation was performed to determine if a relationship existed between student’s age and computer anxiety.

Statistical methods used included: frequencies and mean scores for describing respondents; t-tests and analysis of variance were used to determine differences in the variables, age, access to computers outside the college, access to the Internet outside the college and gender of students.

**SUMMARY**

This chapter provided information on the methods and procedures used to gather the data necessary to conduct the research. The population and the instrument design were identified. The population included students attending Southwest Virginia Community College during the spring semester of 2001. This survey obtained
information regarding age, anxiety level, computer access and gender. The findings of this survey will be presented in Chapter IV.
CHAPTER IV

FINDINGS

The goal of this research study was to determine whether age is a factor in the apprehension of students to use computers at Southwest Virginia Community College. Chapter IV will discuss the findings presented by the survey and review the data collected.

SURVEY RESPONSE

Seventy-five students attending Southwest Virginia Community College were surveyed. There was a 100 percent response rate to the survey. There were six surveys that did not answer all questions that were not included in some of the statistical calculations. Courses surveyed included two English classes, two Psychology classes and one basic Keyboarding class. The surveys were collected from the students anonymously and the student’s names were omitted.

POPULATION

The total of 75 surveys were administered, of which 69 were useable. There were 20 males and 55 female respondents. Demographic data were collected on the following variables: county, age, race, access to computers outside the college, access to the Internet outside the college and gender. These data were needed to give a general description of the respondents. The data were also needed for the analysis as it related to the objectives.

The findings of the survey will be presented in six sections. These sections will relate to: county of residence of respondents, gender of the respondents, access to computers outside the college, access to the Internet outside the college, age of the
respondents, computer anxiety, and the results of the Computer Anxiety Rating Scale (CARS).

There were a total of 75 surveys administered. Of the respondents, eight (10.7 percent) were residents of Buchanan County, four (5.3 percent) were residents of Dickenson County, twenty-five (33.3 percent) were residents of Russell County and thirty-eight (50.7 percent) were residents of Tazewell County.

**County:** The students were categorized according to their county of residence. The data for this variable are presented in Table 1.

<table>
<thead>
<tr>
<th>County</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buchanan</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>Dickenson</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>Russell</td>
<td>25</td>
<td>33.3</td>
</tr>
<tr>
<td>Tazewell</td>
<td>38</td>
<td>50.7</td>
</tr>
</tbody>
</table>

The majority of the respondents reside in Tazewell County, Virginia.

**Gender:** The gender of students in this study follows in Table 2.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>20</td>
<td>26.7</td>
</tr>
<tr>
<td>Female</td>
<td>55</td>
<td>73.3</td>
</tr>
</tbody>
</table>
A slight majority of the students surveyed were female (73.3%).

**COMPUTER ACCESS OUTSIDE THE COLLEGE**

Of the 75 students surveyed, 64 responded yes that they had access to a computer outside of the college. Of these, 57 students indicated that they had access to a computer at home. Five of those surveyed indicated that they did not have access to a computer outside the college. Six did not respond to the question.

**Computer Access Outside the College:** Computer access outside the college in this study follow in Table 3.

**Table 3: Computer Access Outside the College**

<table>
<thead>
<tr>
<th>Response Categories</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>64</td>
<td>85.3</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Missing response = 6

**INTERNET ACCESS OUTSIDE THE COLLEGE**

Of the 75 students surveyed, 63 responded yes that they had access to the Internet outside of the college. Of these, 55 students indicated that they had access to the Internet at home. Eleven of those surveyed indicated that they did not have access to the Internet outside the college. One did not respond to the question.
**Internet Access Outside the College:** Internet access outside the college in this study follow in Table 4.

**Table 4: Internet Access Outside the College**

<table>
<thead>
<tr>
<th>Response Categories</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63</td>
<td>85.1</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>14.9</td>
</tr>
</tbody>
</table>

Missing Response = 1

**AGE RANGE OF RESPONDENTS**

The survey requested respondents to indicate his/her age range by selecting a choice of under 20; 20-29; 30-39; 40-49; 50-59; and above 60. Table 5 revealed the overall findings regarding age.

**Age Range:** Age range of respondents in this study follow in Table 5.

**Table 5: Age Range:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>30</td>
<td>40.0</td>
</tr>
<tr>
<td>20 to 29</td>
<td>20</td>
<td>26.7</td>
</tr>
<tr>
<td>30-39</td>
<td>14</td>
<td>18.7</td>
</tr>
<tr>
<td>40-49</td>
<td>8</td>
<td>10.7</td>
</tr>
<tr>
<td>50-59</td>
<td>2</td>
<td>2.7</td>
</tr>
<tr>
<td>60 Plus</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>
**Age and Computer Anxiety:** The mean age and anxiety of the students in this study is presented in Table 6.

**Table 6: Mean age of respondents:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>29</td>
<td>34.1724</td>
<td>12.361</td>
</tr>
<tr>
<td>Over 20</td>
<td>40</td>
<td>39.9000</td>
<td>15.832</td>
</tr>
</tbody>
</table>

Missing response = 6

The mean age of all students (n=69) was 37 years with a standard deviation of 14.10. Six did not respond to the question.

**COMPUTER ANXIETY**

Seventy-five surveys were administered, but only sixty-nine surveys were complete. Of the twenty questions, students showed more anxiety on some questions than others. The three questions producing the most anxiety were as follows:

**Question 11:** Learning to write computer programs. Students had a higher increase in anxiety for question number 11. The mean for this question was 2.81 and the standard deviation was 1.19 and the range was 4.00.

**Question 7:** Getting “error messages” from the computer. Students showed an increase in anxiety for question number 7. The mean for this question was 2.39 and the standard deviation was 1.07.
**Question 10:** Being unable to receive information because the “computer is down.” Students showed an increase in anxiety for question number 10. The mean for this question was 2.38, and the standard deviation was 1.04.

The three questions producing the least anxiety were as follows:

**Question 5:** Watching a movie about an intelligent computer. Students showed a decrease in anxiety when answering question number 5. The mean for this question was 1.35 and the standard deviation was .74.

**Question 15:** Re-setting a digital clock after the electricity has been off. Students showed a decrease in anxiety when answering question number 15. The mean for this question was 1.35 and the standard deviation was .95.

**Question 19:** Programming a microwave. Students showed a decrease in anxiety when answering question number 19. The mean for this question was 1.41 and the standard deviation was .91.

The survey requested that students answer twenty Likert style questions regarding their anxiety with using a computer and interacting with technology. The twenty questions asked the student to select from a five-point Likert scale. The Likert scale selections were: 1—not at all, 2—a little; 3—a fair amount, 4—much and 5—very much. Table 7 provides a summary of the Likert Scale responses regarding increased computer anxiety levels. The responses to questions causing the most anxiety are summarized in Table 7.
Table 7: Ten questions causing the most anxiety

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Range</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q11</td>
<td>2.81</td>
<td>1.19</td>
<td>4.00</td>
<td>Learning to write computer programs</td>
</tr>
<tr>
<td>Q7</td>
<td>2.39</td>
<td>1.07</td>
<td>4.00</td>
<td>Getting “error messages” from computer</td>
</tr>
<tr>
<td>Q10</td>
<td>2.38</td>
<td>1.06</td>
<td>4.00</td>
<td>“Being unable to receive information because the “computer is down”</td>
</tr>
<tr>
<td>Q1</td>
<td>2.01</td>
<td>1.13</td>
<td>4.00</td>
<td>Thinking about taking a course in a computer language</td>
</tr>
<tr>
<td>Q13</td>
<td>2.01</td>
<td>1.28</td>
<td>4.00</td>
<td>Erasing or deleting material from a computer file</td>
</tr>
<tr>
<td>Q17</td>
<td>1.97</td>
<td>1.15</td>
<td>4.00</td>
<td>Reading a computer manual</td>
</tr>
<tr>
<td>Q3</td>
<td>1.90</td>
<td>1.20</td>
<td>4.00</td>
<td>Applying for a job that requires some computer training</td>
</tr>
<tr>
<td>Q16</td>
<td>1.87</td>
<td>1.26</td>
<td>4.00</td>
<td>Learning computer terminology</td>
</tr>
<tr>
<td>Q12</td>
<td>1.78</td>
<td>1.07</td>
<td>4.00</td>
<td>Thinking about buying a new personal computer</td>
</tr>
<tr>
<td>Q20</td>
<td>1.77</td>
<td>1.02</td>
<td>4.00</td>
<td>Learning how a computer works</td>
</tr>
</tbody>
</table>

Students had more anxiety about writing computer programs, getting error messages, being unable to receive information because the “computer is down”, erasing or deleting material from a computer file and taking a course in a computer language. The mean scores for the response was 2.01.

The Likert scale selections were: 1—not at all, 2—a little, 3—a fair amount, 4—much and 5—very much. Table 8 provides a summary of the Likert Scale responses regarding decreased computer anxiety levels. The responses to questions causing the least anxiety are summarized in Table 8.
Table 8: Ten questions causing the least anxiety

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Range</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q5</td>
<td>1.35</td>
<td>.74</td>
<td>4.00</td>
<td>Watching a movie about an intelligent computer</td>
</tr>
<tr>
<td>Q15</td>
<td>1.35</td>
<td>.95</td>
<td>4.00</td>
<td>Resetting a digital clock after the electricity has been off</td>
</tr>
<tr>
<td>Q19</td>
<td>1.41</td>
<td>.91</td>
<td>4.00</td>
<td>Programming a microwave oven</td>
</tr>
<tr>
<td>Q4</td>
<td>1.43</td>
<td>1.12</td>
<td>4.00</td>
<td>Sitting in front of a home computer</td>
</tr>
<tr>
<td>Q18</td>
<td>1.45</td>
<td>.92</td>
<td>4.00</td>
<td>Watching someone work on a personal computer</td>
</tr>
<tr>
<td>Q6</td>
<td>1.57</td>
<td>.98</td>
<td>4.00</td>
<td>Looking at a computer printout</td>
</tr>
<tr>
<td>Q9</td>
<td>1.64</td>
<td>1.04</td>
<td>4.00</td>
<td>Visiting a computer center</td>
</tr>
<tr>
<td>Q14</td>
<td>1.64</td>
<td>1.08</td>
<td>4.00</td>
<td>Taking a class about the use of computers</td>
</tr>
<tr>
<td>Q8</td>
<td>1.65</td>
<td>1.01</td>
<td>4.00</td>
<td>Using an automated bank teller machine</td>
</tr>
<tr>
<td>Q2</td>
<td>1.68</td>
<td>.96</td>
<td>4.00</td>
<td>Taking a test using a computer scoring sheet</td>
</tr>
</tbody>
</table>

A t-test was used to determine if there were significant differences in the ages that could be attributed to the dependent variable anxiety. These findings are summarized in Table 9.

Table 9: Mean Anxiety

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Mean Anxiety</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>29</td>
<td>34.1724</td>
<td>12.361</td>
<td>-1.62</td>
<td>.071</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>40</td>
<td>39.9000</td>
<td>15.832</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Missing response = 6
The t value of .07 was not significant at the .05 level of probability. This means there was no significant difference in the mean anxiety of 34.17 for under 20 (n=29) and the mean anxiety of 39.90 for over 20 years (n=40). The over 20 population had a slight increase in anxiety than did those less than 20, but it was not significantly higher.

The analysis of variance was applied with computer anxiety as the dependent variable and access to computers as the independent variable to determine if there were significant differences in the anxiety of students having access to computers outside the college. See Table 10 for these findings.

**Table 10: Analysis of Variance: Anxiety for computer access outside the college**

<table>
<thead>
<tr>
<th></th>
<th>Computer Access</th>
<th>No Computer Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>64</td>
<td>5</td>
</tr>
<tr>
<td>Mean</td>
<td>36.5781</td>
<td>49.2000</td>
</tr>
<tr>
<td>SD</td>
<td>14.013</td>
<td>19.331</td>
</tr>
<tr>
<td>Equal</td>
<td>-1.89</td>
<td></td>
</tr>
<tr>
<td>2-Tail Sig</td>
<td>.063</td>
<td></td>
</tr>
</tbody>
</table>

Source: df = 67

Levene’s Test for Equality Variances: F = .608 P = .438

The results were not statistically significant at .063, but those who did not have access to computers outside the college had a strong tendency to show a greater increase in computer anxiety.
SUMMARY

This chapter presented the data collected for the research to determine Southwest Virginia Community College students’ apprehension toward using computers. The survey data were analyzed to determine the percentages for all the questions and the mean responses were provided for the twenty questions that were based on the Likert Scale. The information from the surveys suggested that older students had slightly higher anxiety than did the younger students.

In order to determine computer anxiety, students were asked to respond to statements by rating their computer apprehension (Appendix B). The statements were rated on a five-point scale with five indicating that the respondents had very much anxiety and one indicating not at all. Chapter IV discussed the data gathered and the significance of the information.

The researcher distributed the surveys to seventy-five students attending four different classes at the Southwest Virginia Community College campus. Survey results were presented in eight tables. These tables tabulated the results separately for the respondents indicating computer access at home and for those indicating no computer access at home. The information presented in Chapter IV related to age distribution, gender, perceived computer anxiety and computer/Internet access.

The final chapter of this research study will provide a summary of the study. Chapter V also draws conclusions from the survey data and provides recommendations for strategies to assist students expressing anxiety when dealing with computers.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The problem of the study was to determine whether age is a factor in the apprehension of students to use computers at Southwest Virginia Community College. This chapter summarizes the research study, draws conclusions based on the findings of the data and provides recommendations based on these conclusions.

SUMMARY

Today the computer is part of everyday life, and nowhere is this more evident than in a community college setting. At SVCC, computer interaction is an integral part of almost every academic major. As the academic and business environments continue to implement computer technology, the gap is widening for individuals experiencing computer anxiety.

As students move from college into the knowledge-based work environment, technology learning has to be continuous. It is impossible to succeed in an increasing number of jobs without a working knowledge of technology. Businesses are increasingly using technology to manage information. Word processing programs are used for writing and producing professional newsletters. Spreadsheet programs are used for manipulating numbers and keeping accounting records. Filing and retrieving data are done through using databases. Businesses are creating and presenting their own presentations of information visually using a presentation graphics program (Nickels, McHugh & McHugh, 1999, p. 513).
Communication can be quicker, easier, less expensive and more convenient when performed using the Internet. Students need these technology skills to be more marketable when seeking a job. These are skills that students should acquire while attending Southwest Virginia Community College. Computer technology was an important aspect of the student’s career training. Companies are seeking individuals with as much familiarity as possible with computers and software. This study sought to recommend prevention and strategies that could facilitate anxiety free learning to better prepare individuals for the world of work.

The survey used in this research study was designed to determine the student’s anxiety toward using computers. The survey was distributed to seventy-five students. The response rate was 100 percent.

CONCLUSIONS

Data were collected to determine the student’s computer anxiety rating scale. Using the data collected from the surveys, conclusions can be made based on the four research goals of this study.

The first goal was to identify whether students have access to computers outside the college. Of the 75 students surveyed, 64 responded yes that they had access to a computer outside of the college. Of these, 57 students indicated that they had access to a computer at home. Five of those surveyed indicated that they did not have access to a computer outside the college. Six did not respond to the question. It was the conclusion of this study that the majority of the students surveyed had access to computers at home.
The second goal was to determine whether students had access to the Internet outside the college. Sixty-three (85.1%) students indicated that they had access to the Internet outside the college. Eleven (14.9%) students indicated that they did not have access and one did not respond to the question. It was the conclusion of this study that most of the student's in the survey had access to the Internet outside the college. There were some students that did not have access to the Internet away from the college. Therefore, posting web assignments and requiring use of Internet and e-mail assignments may increase anxiety for some of the students attending SVCC and not having access to the Internet.

The third research goal was to determine whether students' age increased their apprehension to use computers to support their course work. A t-test was run to determine if there were significant differences in the ages that could be attributed to the dependent variable anxiety. The t value of .07 was not significant at the .05 level of probability. This indicates there was no significant difference in the anxiety levels of those individuals under age 20 (n=29) and the anxiety level of those individuals over age 20 years (n=40). Although, the over 20 population had a slight increase in anxiety than did those less than 20, it was not significantly higher.

The last research goal was to identify whether courses surveyed required computer knowledge and skills. Instructors in all four of the classes surveyed indicated that they required the students to know how to use computers to type reports and two of the classes surveyed indicated that they often have their students use the Internet to do research as well as being knowledgeable about e-mail.
RECOMMENDATIONS

Based on the finding and conclusions of this research study, the following recommendations are made to improve student's success at Southwest Virginia Community College.

1. Plan for successful introduction of all computer technology. As computer technology continues to increase in academia, students are going to be required to have access to suitable computer equipment and software. Technology requirements should be revised periodically. Basic technical competency should be a prerequisite and presumed upon entry into classes that require computer usage. Classes that require computer usage and Internet need to be noted in the college catalog and student handbook. This will enable students to be aware of the technology requirements prior to registering for the class.


3. According to requirements of other colleges, the basic computer technology requirements established should include the following:

   **Hardware and Software Requirements:**

   Multimedia, PC-compatible computer

   - Intel Pentium or higher
   - 32 MB memory (RAM)
   - 28.8K modem
   - CD-Rom drive
   - Sound card
   - Color Monitor (VGA)
Printer

Windows 95, 98, Windows NT, Millenium Edition

Adobe Acrobat v. 3.01

Microsoft Office Professional 97 (Word, Excel, Powerpoint, Access)

Internet Service Provider (ISP)

E-mail account which allows for MIME-type file transfer

Web Browser (Netscape Navigator Version 4.0 or Microsoft Internet Explorer)

Note: Technology requirements should be updated each year as technology to stay abreast of the rapid changes that are occurring with this technology

4. Provide low cost computers to students needing a computer, but unable to afford one.

5. Run summer seminars or workshops that students can attend to become more familiar with computers, the Internet and using e-mail.

6. Have the classrooms equipped with the appropriate equipment to encourage the use of technology in instruction and learning.
BIBLIOGRAPHY


Wall Street Journal, July 26, 1993, Sec. B, pg. 4

APPENDICES

APPENDIX A -- Student Computer Access (SVCC)

APPENDIX B -- Computer Anxiety Rating Scale (Form C)

APPENDIX C -- Sample Cover Letter

APPENDIX D -- Human Subjects Committee Review

APPENDIX E -- Approval from the Committee to Proceed

APPENDIX F -- Approval from Southwest Virginia Community College
APPENDIX A

Student Computer Access Survey

The College’s faculty and staff would appreciate if you would take a minute or two to answer a few questions about how and where you have access to a computer and the Internet.

Please respond to the survey once. If you answered this survey in another class, please do not answer it again in this class.

1. Do you have access to a computer outside of the College?
   Yes_______  No_______

If you have access to a computer outside of the College, is it at (answer as many as apply):

   Home_________  Work_________  Other (Specify)____________________

3. Do you have access to the Internet outside of the College? Yes_____  No_____

4. What is the speed of your connection to the Internet? _____ Unknown ______

5. If you have access to the Internet outside of the College, is it at (answer as many as apply):
   Home_________  Work_________  Other (Specify)____________________

   50-59____  60+____

7. Race?  White____  Black____  Hispanic____  Other____

8. Gender?  Male_______  Female____

9. E-Mail Address: Yes_____  No_____

10. Resident: Buchanan Co____  Dickenson Co____  Russell Co____  Tazewell Co____

Thank you for your help!
APPENDIX B

COMPUTER ANXIETY RATING SCALE (FORM C)
COMPUTER ANXIETY RATING SCALE
(Form C)

The items in this questionnaire refer to things and experiences that may cause anxiety or apprehension. For each item, place a check (✓) under the column that describes how anxious (nervous) each one would make you at this point in your life.

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>A Little</th>
<th>A Fair Amount</th>
<th>Much</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thinking about taking a course in a computer language.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Taking a test using a computer scoring sheet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Applying for a job that requires some computer training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Sitting in front of a home computer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Watching a movie about an intelligent computer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Looking at a computer printout.</td>
<td></td>
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<td>7. Getting &quot;error messages&quot; from the computer.</td>
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<td>8. Using an automated bank teller machine.</td>
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<td>9. Visiting a computer center.</td>
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<td>10. Being unable to receive information because the &quot;computer is down.&quot;</td>
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<td>11. Learning to write computer programs.</td>
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<td>12. Thinking about buying a new personal computer.</td>
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<td>13. Erasing or deleting material from a computer file.</td>
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<td>14. Taking a class about the use of computers.</td>
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<td>15. Re-setting a digital clock after the electricity has been off.</td>
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<td>16. Learning computer terminology.</td>
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<td>17. Reading a computer manual.</td>
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<td>18. Watching someone work on a personal computer.</td>
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<td>19. Programming a microwave oven.</td>
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<td>20. Learning how a computer works.</td>
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APPENDIX C -- Sample Cover Letter

Dear Student Participants:

I am asking for your participation in research to determine computer anxiety among current Southwest Virginia Community College students. Graduates of Southwest Virginia Community College enter a high-skilled work environment designed around technology. Instructors of these programs may desire specific technology training relevant to their teaching field in order to better prepare students for knowledge-based opportunities that are increasing rapidly. The information compiled from this survey may be instrumental in determining whether computer classes should be a prerequisite for students taking classes at Southwest Virginia Community College.

Participation in this study is encouraged and all responses will be kept strictly confidential. I am pursuing my Masters Degree in Business and Industry Training and the information provided by this research will be very beneficial in my completing the research requirement for this program. This is also an opportunity for you to express your feelings regarding computer usage at Southwest Virginia Community College.

The attached survey will take approximately 10 to 15 minutes to complete. Results of the survey will be available for those participants interested in seeing the results. Your participation in this study will be greatly appreciated. Thank you for your time and consideration in assisting me with my research.

Sincerely,

Delilah T. Long
Adjunct Faculty Member
Southwest Virginia Community College

Attachments
1. **Title of Research Project:** A study to determine whether age is a factor in the apprehension of students to use computers at Southwest Virginia Community College.

2. **Applicants:**

   **Principal Investigator:** Delilah T. Long

   **Campus Address:** Southwest Virginia Community College
   Small Business Development Center
   P.O. Box SVCC
   Richlands, Virginia 24641

   **Phone #:** (540) 964-7337

   **E-mail:** Delilah_Long@sw.cc.va.us

   **Fax #:** (540) 964-7575

   **Faculty Sponsor:** Dr. John Ritz

   **Campus Address:** Old Dominion University - Norfolk
   Occupational and Technical Studies
   Technology Building Room 108
   Norfolk, VA 23529

   **Phone #:** (757) 683-4305

   **E-mail:** jritz@odu.edu

   **Fax #:** (757) 683-5227
Experimenter: Delilah Long

Phone # and Room #: (540) 964-7337 and Tazewell Hall, T-349

3. This study is being conducted as part of: Masters Thesis Graduate Research Project

4. Is this research project externally funded or contracted for by an agency or institution that is independent of the university? (If yes, indicate the granting or contracting agency and provide identifying information. Remember, if the project receives any federal support, then the project cannot be reviewed by a College Committee and must be reviewed by the IRB).

This research project is not externally funded or contracted for by an agency or institution which is dependent on the university.

5. If approved, when will the experiment begin: (If unknown at the time you fill this out, please contact the chairperson of the CC when you have a calendar date set).

If approved, the surveys will be distributed the first week of April, 2001.

6. Has the project been reviewed by any other committee (university, governmental, private sector) for the projection of human research participants? (If yes, indicate the committee and its decision).

The project has not been reviewed by any other committee.

7. Attach a description of the proposed study, the research protocol, references and any letters, flyers, questionnaires, etc. which will be distributed to the study subjects or other study participants. The description should be in sufficient detail to allow the Human Subjects Review Committee to determine if the study can be classified as exempt under VA Code 32.162.17.

See attachments:

Chapters I, II and III of the Master Thesis
Cover Letter
SVCC Computer Access Survey
Computer Anxiety Rating Scale (Form C)
Computer Thoughts Survey (Form C)
General Attitudes Toward Computers Scale (Form C)

Then, identify which category applies to your research proposal and explain why the proposed research meets the category.
Category 2 applies to my research proposal. The research will involve surveys, but the data from such tests are recorded in a manner so that subjects cannot be identified, directly or through identifiers linked to the subjects.

**Virginia Law identifies the following exempt categories:**

1. Research or student learning assessments conducted in educational settings involving regular or special education instructional strategies, the effectiveness of or the comparison among instructional techniques, or the use of educational tests, **IF** the data from such tests are recorded in a manner so that subjects cannot be identified, directly or through identifiers linked to the subjects.

2. Research involving survey or interview procedures **UNLESS** responses are recorded in such a manner that the subjects can be identified, directly or through identifiers linked to the subjects, **and either**
   - (a) the subject’s responses, if they became known outside the research, could reasonably place the subject at risk of criminal or civil liability or be damaging to the subject’s financial standing or employability or
   - (b) the research deals with sensitive aspects of the subject’s own behavior, such as sexual behavior, drug or alcohol use, or illegal conduct;

3. Research involving survey or interview procedures, when the respondents are elected or appointed public officials or candidates for public office;

4. Research involving solely the observation of public behavior, including observation by participants, **UNLESS** observations are recorded in such a manner that the subjects can be identified, directly or through identifiers linked to the subjects, **and either**
   - (a) the observations recorded about the individual, if they became known outside the research, could reasonably place the subject at risk of criminal or civil liability or be damaging to the subject’s financial standing or employability or
   - (b) the research deals with sensitive aspects of the subject’s own behavior, such as sexual behavior, drug or alcohol use, or illegal conduct; and

5. Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, **IF** these sources are publicly available **or** **IF** the information is recorded by the investigator in a manner so that subjects cannot be identified, directly or through identifiers linked to the subjects.

**PLEASE NOTE:**
1. You may begin research when the College Committee gives notice of its approval.
2. You must inform the College Committee of any changes in method or procedure which may conceivably alter the risk potential of participating subjects.
3. You must inform the College Committee when your project is complete.
4. At any time the committee reserves the right to re-review a research project, to request additional information, to monitor the research for compliance, to inspect the data and consent forms, to interview subjects that have participated in the research, and if necessary to terminate a research investigation.

_________________________  ____________________________
Principal Investigator’s Signature                             Date

_________________________
Faculty Sponsor’s Signature                             Date

(If the principal investigator is a student, then this form must be countersigned by a faculty sponsor who will assume responsibility for ensuring compliance with appropriate legal guidelines.)
Delilah
Thank you for the letter from the community college. You may now proceed with your research.
Stacie Raymer

Stacie Raymer, Ph.D.
Dept of ESSE/ Child Study Center
Old Dominion University
45th St & Hampton Blvd
Norfolk, VA 23529-0136
office 757-683-4522
fax 757-683-5593
sraymer@odu.edu
March 22, 2001

Dr. Stacie Raymer, Human Subjects Committee Chair  
College of Education  
Dept. of ESSE, Child Study Center  
45th Street and Hampton  
Norfolk, VA 23529-0136

Dear Dr. Raymer:

Delilah Long has the permission of Southwest Virginia Community College to proceed with her study, “A Study to Determine Whether Age is a Factor in the Apprehension to Use Computers at Southwest Virginia Community College.”

If you have any questions, please do not hesitate to give me a call at (540) 964-7315.

Sincerely,

[Signature]

Dr. Charles R. King, President  
Southwest Virginia Community College