

COMPUTER ANXIETY AND THE COMMUNITY COLLEGE STUDENT:

IMPLICATIONS FOR PRACTICE

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# COMPUTER ANXIETY AND THE COMMUNITY COLLEGE STUDENT: IMPLICATIONS FOR PRACTICE

## Abstract

Over the past 30 years, numerous studies of computer anxiety have been conducted in a variety of educational and workplace settings. While many studies have been conducted in educational settings in general, a simple search of the ERIC database revealed relatively few studies investigating the computer anxiety of community college students. Thus, the purpose of this study was (a) to determine the level of computer anxiety, (b) to determine the proportion of variance in the computer anxiety explained by selected variables, and (c) to determine the strength of the relationship between computer anxiety and selected variables among participating community college students. Results of this study revealed that low levels of computer anxiety are reported by community college students and that the variables weekly computer use, Test One (computer systems) scores, and high school computer courses explained a significant proportion (31%) of the variance in community college student computer anxiety. In addition, the variables weekly computer use, Test One (computer systems) scores, and high school computer courses were significantly (negatively) correlated with computer anxiety.

## Introduction

Computers and their associated technologies have permeated the very fabric of society. As such, the use of computers is quickly becoming an essential skill in most careers and educational programs (Marcoulides, 1988; Maurer & Simonson, 1993-94). As McPherson (1997) explained, “with the expansion of computer technology, the importance of preparing individuals for entry and success in an increasingly computerized society is evident” (p. 12). While many agree that the proficient use of computers is an essential skill, there are those

individuals who may be overlooked by such technological advancements. For example, Gos (1996) noted that many computer anxious individuals have been left behind as more educational and workplaces become computerized as computer anxiety limits their options in both career and educational endeavors. More expressly, Gos stated

The most tragic result of computer anxiety, though, lies in the students who simply give up and fall through the cracks, foregoing an education because of the inescapable presence of computers. It is clear that the problem needs to be dealt with before we create a new underclass consisting mainly of computer illiterates” (pp. 275-276).

Given the obvious need to possess computer skills and the potential impact on those individuals who fall through the cracks, it is no wonder that the study of computer anxiety has received considerable attention by researchers. Indeed, a simple search of the ERIC database using the descriptor “computer anxiety” revealed studies of the topic nearly 30 years ago (e.g., Powers, Cummings, & Talbott, 1973). In a more recent study, Anderson (1995) examined the computer experience, perceived knowledge of software, overall knowledge of computers, programming experience, and gender on computer anxiety and performance unit in information systems. As noted by Anderson, perceived knowledge rather than computer experience was found to be a significant predictor of computer anxiety. Further, Marcoulides (1987) reported that computer anxiety is a good predictor of computer achievement in college students taking computer classes. In another study, Howard, Murphy, and Thomas (1987) reported significant, negative correlations with computer anxiety and computer knowledge, computer experience, and class rank. They noted that non-significant correlations with computer anxiety were found for the variables age and GPA. Results of the Necessary and Parish (1996) study indicated that

weekly computer experience increases were significantly correlated with lower computer anxiety, enhanced computer confidence, greater computer knowledge, and increased liking for computers. Finally, Parish and Necessary (1996) examined the variables voluntary or non-voluntary weekly computer use, own or have owned a computer, gender and age for their impact on computer anxiety. Participants who had voluntarily used a computer were more likely to demonstrate less computer anxiety and more computer confidence and liking than those who had not voluntarily used a computer. In addition, as explained by Parish and Necessary, participants who owned or have owned a computer were more likely to demonstrate less computer anxiety and more computer confidence and liking than those who had not owned a computer.

The computer anxiety of students has been examined in a variety of educational settings. For example, Anderson (1995), Howard, Murphy, and Thomas (1987), Leso and Peck (1992), Marcoulides (1988), Marcoulides and Wang (1990), Maurer and Simonson (1993-94), Necessary and Parish (1996), and Parish and Necessary (1996) have examined the computer anxiety of four-year college and university students. Researchers have also examined the computer anxiety of adult basic education students (e.g., Massoud, 1991), elementary and middle school students (e.g., Campbell & Dobson, 1987), older adults (e.g., Temple & Gavillet, 1990), and part-time MBA students (e.g., Igbaria & Chakrabarti, 1990). While there has been considerable interest in the computer anxiety of students in variety of educational settings, a simple search of the ERIC database returned only one journal article when the terms “computer anxiety” and “community colleges” were combined (i.e., Kuhn, 1989). Thus, there is a gap in the literature regarding the computer anxiety experienced by community colleges students. This study is significant in that it will add to the very limited literature regarding the computer anxiety of community college

students. In addition, this study offers practice implications for educators teaching in community colleges.

### Purpose

The three-fold purpose of this study was to (a) determine the level of computer anxiety, (b) to determine the proportion of variance in the computer anxiety explained by selected variables, (c) to determine the strength of the correlation between computer anxiety and selected variables among participating community college students. Specifically, answers to the following questions were sought.

1. What is the level of computer anxiety among selected community college students?
2. What is the proportion of variance in community college students' computer anxiety explained by selected variables: age, community college credits completed, computer use, gender, level of education, major status (i.e., declared or undeclared), Test One score, and Test Two score?
3. Are there significant correlations between the selected variables and community college students' computer anxiety?

### Methodology

This section describes the participants, instrumentation, data collection procedures, and data analysis. Students enrolled in five Beginning Windows courses at a community college in a northeastern state served as the participants in this study. Participation in the study was voluntary with no incentives provided. Data were gathered through the use of the Computer Anxiety Index (CAIN), parts one and two of the Standardized Test of Computer Literacy, and an information form developed by the researchers. The CAIN consists of 26 items and was designed to identify the students' computer-related anxieties (Simonson, Montag, Maurer,

Oviatt, & Whitaker, 1992). For the purpose of CAIN development, Simonson, Maurer, Montag-Torardi, and Whitaker (1987) defined computer anxiety as “the fear or apprehension felt by individuals when they used computers, or when they considered the possibility of computer utilization” (p. 238). Participant response options on the CAIN were 1 = strongly agree, 2 = agree, 3 = slightly agree, 4 = slightly disagree, 5 = disagree, and 6 = strongly disagree. Possible participant scores ranged from a low of 26 (low computer anxiety) to high of 156 (high computer anxiety). Test-retest reliability of the CAIN was determined to be .90. Validity of the CAIN was evaluated by correlating it to a measure that has been determined to be valid. More specifically, the CAIN was determined to correlate highly with the State-Trait Anxiety Index, an established instrument designed to measure anxiety (Simonson et al., 1987). The STCL consists of three subtests: computer systems, computer applications, and computer programming. Given that each STCL subtest is administered in timed, 30-minute sessions, only the computer systems and computer applications sections were used in this study. The computer systems and computer application subtests consisted of 29 and 28 multiple choice items, respectively. The STCL was selected for use in this study because it “can be used to identify skills possessed by either individuals or groups, and to assist program planners in the evaluation of various computer literacy experiences” (Simonson et al., 1992, p. 2). In addition, participants were also asked to complete an information form. Self-reported data collected on this form included age, community college credits completed, computer use, gender, level of education, and major status (i.e., declared or undeclared). Data were collected by distributing survey packets to students enrolled in five intact sections of Beginning Windows classes at the main campus of a community college located in a northeastern state. Survey packets were distributed to all students in attendance on the date of data collection. Each survey packet contained the CAIN,

Test One and Test Two of the STCL, and an information form. Participants were provided instruction on how to complete the various items contained in the survey packet. Following Institutional Review Board approved protocol for the protection of human subjects, students were asked not to write their names on any materials in the survey packet nor were any identifiers included on the packets when submitted to participants. Thus, data collection was completed anonymously. Several analytical procedures were applied to the data to answer the research questions. To answer question one and determine the level of computer anxiety among community college students, descriptive statistics were used. To answer question two and determine the proportion of variance in the participants' computer anxiety explained by selected variables, stepwise multiple regression was used. To answer question three and determine if there were significant correlations between the selected variables and community college students' computer anxiety, Pearson's product correlations were used to determine if significant relationships existed between the selected variables and computer anxiety. Davis' (1971) descriptors were used to describe the strength of these correlations. All tests of significances were conducted at  $\alpha = .05$ .

### Findings

Descriptions of the respondents as well as the findings for the three research questions are presented in this section. The participants reported an average age of 32.52 years with a range of 17 to 81. Of the 82 participants, 42 (51%) were females and 40 (49%) were males, respectively. Regarding major, 44 (54%) reported having declared a major and 38 (46%) indicated that they had not declared a major. The vast majority ( $n = 59, 72\%$ ) of participants reported high school as their highest level of education. In regard to computer use, a majority of participants ( $n = 54, 66\%$ ) reported an average of ten or fewer hours of computer use per week. Thirteen (16%) of the

82 participants reported no computer use over the past year. Regarding computer courses completed, 51 (62%) and 71 (87%) indicated that they had not completed a high school or community college computer course, respectively. Participant scores on Test One (computer systems) ranged from a low of 0 to a high of 23 with a mean and standard deviation of 9.02, SD = 4.89; participant scores on Test Two (computer applications) ranged from a low of 0 to a high of 20 with a mean and standard deviation of 6.15, SD = 4.80. Research question one sought to determine the level of level of computer anxiety among community college students. To determine the level of computer anxiety among community college students, their scores on the CAIN were determined. Scores on the CAIN ranged from a low of 26 to a high of 100 with a mean and standard deviation of 52.45 (SD = 17.06). Research question two sought to determine the proportion of variance in community college students' computer anxiety explained by selected variables. Computer use, Test One (computer systems), and number of high school computer courses entered into the stepwise regression equation as explaining significant proportions of the variance in community college students' computer anxiety. These three variables explained 30.8% of the variance in CAIN scores. Over 15% of the variance was explained by computer use. Community college student scores on Test One, computer systems explained 9.8% of the variance. The number of high school computer courses completed explained 5.8% of the variance. Research question three sought to determine if there were significant correlations between the selected variables and community college students' computer anxiety. Computer use, scores on Test One (computer systems), and high school computer courses completed were significantly correlated with community college students' computer anxiety. The correlation for each of these three variables was negative and the strength of the relationships was low (Davis, 1971).

## Conclusions

A number of conclusions can be drawn from the findings of this study. First, the community college students in this study reported relatively low levels of computer anxiety. More specifically, the community college students in this study reported a mean and standard deviation of 52.45,  $SD = 17.06$  on the CAIN. Second, selected variables do explain significant proportions of the variance in community college students' computer anxiety. More specifically, computer use, score on Test One (computer systems), and high school computer courses explained about 31% of the variance in community college student computer anxiety. In addition, these three variables were also significantly (negatively) correlated with community college students' computer anxiety.

## Implications for Practice

The fact that the community college students in this study reported low levels of computer anxiety has positive practice implications for community college educators. First, these community college students are being asked to function in an educational system permeated by computers. Low levels of computer anxiety among community college students will make it easier for community college business faculty to integrate computer use into instruction and assignment completion. An added benefit of this low level of community college students' computer anxiety is that many of these learners are taking courses to improve their workplace skills in the use of computers. Computer use is for all practical purposes ubiquitously distributed in the workplaces that these students are preparing to enter. Thus, community college educators should feel comfortable in having students use computers in their respective classes.

While the low levels of computer anxiety reported in this study has positive practice implications, it may behoove community college educators to establish procedures to place

students in courses based on their computer skills and anxiety. About 20% of the community college students in this study reported moderate to high levels of computer anxiety, a percentage of students much too high to be ignored by community college educators. Similar procedures all ready exist for placing community college students in English, math, and reading course sequences. Such a procedure would assist in placing community college students in a sequence of courses which best reflects their computer skill and anxiety levels and provide needed support to those student might otherwise dropout. Thus, such an approach may serve to foster community college student success by taking individual learner's computer skills and anxiety into account into the educational process. This implication for practice for community college educators is supported by the results of several research studies. For instance, Necessary and Parish (1996) noted "College students with little or no experience with computers have more anxiety when required to take a computer literacy course than those who have had previous computer experience" (p. 384). Placing computer anxious students in a pre-program computer course designed to develop the skills needed to succeed in community college business programs may be needed for facilitating learner success in their respective programs of study. Maurer and Simonson (1993-94) reported the results of their ". . . study strongly supported the position that an introductory computer course can be effective in reducing computer anxiety" (p. 216). Finally, Howard et al. (1987) suggested that offering separate classes for computer anxious students might have positive outcomes for learns and instructors alike.

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