THE RELATIONSHIP BETWEEN THE ATTITUDE OF ADULT GRADUATE STUDENTS TOWARD COMPUTERS AND COMPUTER BASED INSTRUCTION AND THEIR OWNERSHIP OR ACCESSIBILITY OF A PERSONAL COMPUTER

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TABLE OF CONTENTS

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Background

The number of computers and the rate at which our society is becoming computerized is constantly accelerating (Maurer & Simonson, 1984). Personal computers are finding their way into more and more businesses and homes. As in many societies, this introduction of technological change leads to concern about how people will react to the changes it brings to their lives (Cambre & Cook, 1985). Some individuals will readily adapt to the new technology while others will resist the changes it brings to their lives. As teaching methods and curricula change to incorporate computers and their technology, the attitudes of adults towards the computer technology must be of great concern to educators and curriculum developers.

Attitudes are a direct result of a person's past experience and an indirect result of the experiences and attitudes of friends. Attitudes also arise indirectly from the attitudes of reference groups and membership groups (Cross, 1988). Thus, as people have increasing positive experiences with computers, their attitudes will change to reflect these experiences.

The initial review of literature revealed that there was little or no information available on the attitudes of adult students toward computers or computer based instruction, and that a possible future development of education delivery systems would be based on computers and computer based instruction (Smith, Carol E., 1981). The relationship between the attitudes of adult graduate students toward computers and computer based instruction and their ownership or accessibility to a personal computer was considered to be an appropriate and timely direction for the study.

Problem

The problem the study addressed was the resistance of adult learners to expanding computer technology.

Significance of Problem

Obstacles identified in education for adult learners include resistance to change and adaptation to rapidly expanding technology (Cross, 1981). These obstacles have been particularly difficult for adults adapting to the technology of the nineties. Because of the increased use of computers and computer based instruction to offset the rising costs of education, and the increasing number of adults returning to the classroom, a study of the relationship between the attitudes of adult graduate students toward computers and computer based instruction and

their ownership or accessibility to a personal computer was deemed timely.

Purpose

The purpose of the study was to examine the relationship between ownership or accessibility of personal computers and the attitude toward computers and computer based instruction of adult graduate students at Oklahoma State University. Demographic information obtained during the study was examined to determine if patterns developed indicating ownership or attitudinal bias.

Objectives

Four objectives were identified as necessary to accomplish the purpose of the study. These objectives were:

1. To identify computer ownership and accessibility patterns among a sample of adult graduate students from the colleges at Oklahoma State University.
2. To determine attitudes toward computers and computer based instruction of the adult graduate students participating in the study.
3. To determine differences in attitude due to age, race, sex, education level, current grade point average, and average annual income of the adult graduate students participating in the study.

4. To determine differences in attitudes toward computers and computer based instruction between the ownership, non-ownership, and demographic groupings.

Assumptions

For the purposes of this study, the following assumptions were accepted by the researcher:

1. That classes selected for the study were representative of the classes in the respective college.
2. That the students' responses to statements favorable and unfavorable to computers and computer based instruction would serve as predictors of their attitudes toward computers and computer based instruction.
3. That the opinions expressed by the students were honest expressions of their attitudes.

Limitations

This study was conducted specifically with adult graduate students at Oklahoma State University and may not reflect the attitudes of adult students in other environments.

Definitions

The following definitions of terms are furnished to

provide clear and concise meanings of terms as used in this study:

1. Computer anxiety - The fear or apprehension felt by an individual when using computers, or when considering the possibility of computer utilization (Maurer & Simonson, 1984).
2. Computer Assisted Instruction (CAI) - The presentation of educational material such as lessons, drill and practice exercises, laboratory simulations, and instructional games using the computer (Delpierre, 1983).
3. Computer Managed Instruction (CMI) - The presentation of testing episodes, diagnosis of deficiencies, prescription of remedial material, and record keeping of the process (Delpierre, 1983).
4. Computer Based Education (CBE) and Computer Based Instruction (CBI) - Broad terms that encompasses both CAI and CMI (Delpierre, 1983).
5. Adult Graduate Student - An individual over the age of 21 who completed their undergraduate degree, worked in a public or private sector job, and returned to education by enrolling in a graduate level course of instruction at Oklahoma State University in the College of Arts and Sciences, Business Administration, Education, or Engineering.

Scope

The scope of this study included:

1. A measure of the effect of ownership and accessibility to personal computers on the attitudes toward computers and computer based instruction.
2. Adult graduate students enrolled in the 1992 summer semester at Oklahoma State University.

CHAPTER II

REVIEW OF LITERATURE

Introduction

> If technological change and the knowledge explosion make lifelong learning increasingly necessary, they also make it increasingly possible (Cross, 1988 p 30).

Most adults have seen the technology explosion take computers from monstrous sized machines that were kept in climate controlled conditions to a textbook size machine that can, and does, fit in a briefcase. The change in size has been accompanied by a corresponding decrease in price. The computer has become affordable as a tool for the classroom and as a study guide and partner at home. Adult education can readily benefit from the use of computers to increase the effectiveness of the instructor and allow self paced learning with more individualized attention from the instructor. However, barriers to the use of computers in adult education do exist and must be overcome.

The Computer as a Tool in the Classroom

The use of computers as a classroom tool began as early as 1965. Programmed Logic and Automatic Teaching Operations (PLATO) was used by Indiana University as adjuncts to

traditional instruction in several departments. Ranging from math to music and grammar to science, PLATO has been used for private tutoring and classroom assistance since 1965 with positive results. It has also been a valuable research tool for both teaching and CAI. While the initial cost of a core computer was high, the ultimate value in instruction and communication was correspondingly high ("A Teacher Named PLATO: Computer-Assisted Instruction," 1981).

The development of computers and computer tools for instructors has continued. David Paquin (1989) developed a computer based training program to teach instructors to develop high quality training aids that included graphics and word processing. The study was reported to be very successful with a cost of developing the program reported to be under two thousand dollars. Once trained, the instructors in the program saved one hundred dollars per training aid developed.

Increasing the Effectiveness of the Instructor

In 1985, Chin-Lin Kulik, James A. Kulik, and Barbara Shwalb reported a study that had the purpose of using a meta-analytic methodology to examine studies in both military and nonmilitary settings, and to examine effects of CBE in technical training and in adult basic education.

The major questions addressed by the study were how effective is CBE with adult learners in nontraditional settings, is it especially effective for certain types of

outcomes, are certain types of programs especially effective, is CBE especially effective with certain types of adult learners, and under which conditions does CBE appear to be most effective with adults.

Three major sources were researched to use in the meta-analysis; Orlansky and String's 1979 review of findings on computer applications in military training, Lockheed's Dialog Online Information Services, and ERIC. Twenty four studies were selected that met four basic criteria. The outcomes of the studies were expressed on a common scale of measurement, Effect Size (ES).

The study was able to show that CBE has a positive effect on adult learners. It raised final examination results in the typical study by 0.42 standard deviations. One of the most profound effects shown by the study was the reduction of instruction time with the use of CBE. On the average, CBE students required 71% of the time required by conventional teaching methods.

Obstacles to Adult Education

Cross (1988, pp. 98-108) classified obstacles to adult education under the headings of situational, institutional, and dispositional barriers. CBE may be viewed by adults under all three of these headings. The cost of a personal computer and the time devoted to learning to operate a computer may be a situational barrier for many adults. The lack of training on computers may be an institutional

barrier to adults who would otherwise enroll in a course where a computer is used in the classroom. Dispositional barriers are encountered when the adult considers himself to old to learn about computers. As computers become a more integral part of our society, these barriers decrease and adult attitudes toward computers and computer use in education will become more positive.

Computer Based Instruction in Adult Education

Carol E. Smith (1981) conducted a study using 31 adults enrolled in an advanced medical-surgical nursing course. Using dependent variables of cognitive learning and affective outcomes post CAI with independent variables of lecture-discussion with CAI or lecture-discussion alone, the study found: 1) no significant differences between groups on cognitive learning as measured by objective tests; 2) both groups learned significantly as measured by pre- to post-test gain; 3) the CAI group had significantly higher self ratings on confidence in the subject area; 4) study time was the same for both groups; 5) the most frequently chosen preferred method of learning was lecture-discussion supplemented with CAI; 6) both methods were equally and highly rated; 7) CAI supplemented method did not negatively affect social interaction. The study concluded that, although the sample size was small, it appears that CAI supplemented lecture and discussion should be considered

where the aims of continuing education are to increase both knowledge and confidence.

Literacy in Adults

Studies on CBE in adult literacy programs have demonstrated the effectiveness of computers in this area of adult education.

The Garfield County School District in Southern Utah developed a multiple option instructional program for adult high school completion students that included computer-assisted instruction as an option. 46 of the 85 adults in the county who did not have a high school diploma were recruited into the program. Individualized Education Programs (IEP) were developed for each student. In earning between 6 and 8 credits, 16 students participated in correspondence courses, 3 in computer assisted instruction, 24 in evening classes, 6 in audio-tutorial courses, 19 in one-to-one or small group tutoring, and 6 in competency testing. While the number of students participating in the CAI option was small, it was well received by those who did chose the option (Rickards, Joseph M., 1983).

Mr. Charles Bailey and Dr. William D. Rentz (1989) report success with a pilot program for adult literacy at The Center for Advancing Technology in Caswell County, North Carolina. With the mission of developing innovative ways to combat adult illiteracy, the center designed a model for rural adult education throughout the state.

The program integrated regular and computer sessions providing orientation, instruction, drilling and practice, fun and games, quizzes and tests, voice programming, and learning styles surveys. A series of performance based, monetary rewards encouraged instructor team interest and participation.

Objective results of the program are not available. However, subjective reports from both instructor teams and students indicate a high degree of satisfaction with the program.

Adult Attitudes Toward Computer Based Learning

Very little research has been done on the attitudes of adults toward computers and CBE. Clayborne (1988) conducted research on 1282 urban junior high school students and 301 mothers to measure academic achievement, social life, future employability of boys, and future employability of girls. The findings indicated a great deal of similarity between mother and student attitudes towards computers. Other studies indicate that adult satisfaction with outcomes of computer based instruction is generally positive (Baily, 1989; Kulik et all, 1985; Barton, 1983; Cleland, 1983; Rickards, 1983; Russell, 1983; Slimmer and Payne, 1983; and Smith, 1981). These studies did not attempt to specifically measure attitudes about computers

Related Research

One area of research related to opinions about computers and their use in education is research on computer anxiety. This field of research is relatively new with groundbreaking studies conducted by S. B. Weinberg in 1980 (Dukes, Discenza, & Couger; 1989) Since that time, several computer anxiety scales have been developed.

Mauer and Simonson (1984) developed a Computer Anxiety Index (CAIN) to measure the trait of computer anxiety and to predict the development of the state of computer anxiety in individuals. The CAIN uses a six-point Likert scale of agreement disguised as an opinion survey to obtain participants responses. The results of administering the CAIN show that people in all fields are susceptible to developing computer anxiety. Identification of computer anxious individuals for special training considerations and familiarization with computers through interaction have been shown to reduce computer anxiety.

Summary

The use of CBE to enhance traditional classroom options in adult education programs is beginning to surface as a viable option for educators and adult students. The cost of the minicomputer and microcomputer is reaching the stage where it is affordable for home use by the student and instructor. As tutorial and instructional software packages

become more readily available, CBE will become an integral part of the education process.

CHAPTER III

PROCEDURES

Research Methods and Design

The study was developed as a combination of a descriptive and correlation study. The steps involved were:

1. Review of literature.
2. Identification of attitudes as a problem among adult learners
3. Statement of problem
4. Identification or development of an instrument for gathering the information.
5. Identification of target population and determination of sampling method.
6. Procedure for information collection.
7. Collection of information.
8. Analysis of information.
9. Generalizations and/or predictions.

Review of Literature

The review of literature, as described in Chapter II, revealed that there was a good deal of research on the effectiveness and efficiency of computers and computer based instruction. However, there was little or no research

available on the attitudes of adult students toward the computer or computer based instruction

Identification of Attitudes as a Problem Among Adult Learners

Attitudes and self-perceptions about oneself as a learner are classified by Cross (1981) as barriers to adult participation in learning.

Statement of the Problem

The problem addressed in this study was the resistance of adults to expanding computer technology.

Development of an Instrument for Gathering the Information

A review of the literature revealed that no instrument was available applicable to this study. Therefore, an instrument was developed using the following methodology:

1. Identification of information needed to solve the problem.
2. Development of instrument.
3. Validation of the instrument.
4. Reliability of the instrument.

Identification of Information Needed to Solve the Problem. The basic information needed to solve the problem was identified as the attitudes of adult graduate students toward personal computers and computer based education, and

whether the graduate student owned or had access to a personal computer or not. In addition, basic demographic information would be collected to allow the researcher to identify additional patterns affecting attitudes toward computers and their use in education.

Development of Questionnaire. A panel of four instructors who use computers as part of their instruction at the National Guard Bureau Logistical Training Center at Pryor, Oklahoma, were asked to use the brainstorming technique to develop 20 statements, 10 statements about computers and 10 statements about computer based education. These 20 statements were designed to reflect attitudes towards perceived situational barriers such as cost, time, and availability; institutional barriers such as course requirements, time for completion, degree requirements, and prerequisite requirements; and dispositional barriers such as age, confidence of ability, knowledge of what to learn, and energy or stamina requirements. Attitudes toward these statements would be measured by asking the participants to respond to the statements on a Likert type scale ranging from strongly agree to strongly disagree.

The participant would also be asked to respond to a demographic questionnaire which would allow the researcher to determine patterns which affect the participant's attitudes. The information requested was divided into the areas of computer accessibility and demographic information. The computer accessibility information would determine if

familiarity with computers and computer based instruction would affect the participant's attitudes. The demographic information would determine if situational circumstances such as age, race, sex, grade point average, or income would affect the participant's attitudes.

Validation of the Instrument. A panel of experts consisting of Dr. James Key, Dr. Robert Nolan, Dr. Gary Oakley, Dr. John Baird, Dr. Meg Kletke, Ms. Joyce Friske, and Mr. Tom Buttress were asked to validate the content of the instrument. This panel represented experts in the fields of adult learning, research design, statistics, and computer technology. Minor changes recommended by this panel were incorporated into the instrument. The validated instrument used for this study is at Appendix A.

Reliability of the Instrument. To determine reliability, the instrument was administered to a random sample of 47 adult graduate students enrolled in Oklahoma State University night courses at the University Center of Tulsa. A correlation matrix was developed on the participants responses to the 20 statements. The mean of the 190 correlations developed in the matrix was determined to produce the interitem correlation. A reliability coefficient of .844 was determined using Cronbach's alpha, expressed as:

$$\text{alpha} = Np/[1+p(N-1)]$$

where N equals the number of items and p equals the mean

interitem correlation.

The mathematical calculations were:

$$\begin{aligned} \text{sum of the 190 correlations} &= 40.392 \\ p &= 40.39/190 \\ &= .213 \\ \text{alpha} &= 20(.213)/[1+.213(20-1)] \\ &= 4.26/5.047 \\ &= .844 \end{aligned}$$

Identification of Target Population and Determination of Sampling Procedure

The target population was adult graduate students enrolled at OSU. Using the definition of adult graduate students in Chapter 1, the target population was further reduced to graduate students enrolled in the colleges Arts and Sciences, Business Administration, Education, and Engineering. This reduction of the target population was designed to eliminate students who were enrolled in courses of study that spanned the undergraduate and graduate programs, such as the College of Osteopathic Medicine and Veterinary Medicine, and who might not have had comparable experiences with the adults in the other colleges. The resulting target population was 1,715 graduate students.

The large number of graduate students, the cost of mailing questionnaires, and the questionable response to a mailed questionnaire resulted in a decision to use cluster sampling of representative classes in each of the colleges at OSU.

Procedure for Information Collection

The sample classes were drawn by the Office of Institutional Research at Oklahoma State University and, according to them, represented a proportional sample of the graduate students enrolled in the colleges of Arts and Sciences, Business, Education, and Engineering. Table I shows the proportional sample that was developed by the Office of Institutional Research.

TABLE I

PROPORTIONATE SAMPLING PROCEDURE

COLL	N OF COLL	PERCENT OF COLL	CUMULATIVE FREQUENCY	N OF SAMPLE	PERCENT SAMPLE	CUMULATIVE FREQUENCY
AS	624	36.4	624	74	26.1	74
BU	190	11.1	814	29	10.2	103
ED	589	34.3	1403	145*	51.2	248
EN	312	18.2	1715	35	12.4	283

*Includes students enrolled in ED courses who were AS, BU, or EN majors.

The instructors of the courses identified by the Department of Institutional Research were contacted for permission to survey their class. The purpose of the study was explained to the participants in each class and they were asked to complete the survey instrument.

Collection of Information

The study was conducted at Oklahoma State University on the Stillwater and University Center at Tulsa campuses during the Summer semester, 1992.

Analysis of Information

The basic tools of descriptive statistics were used to describe the information gathered. These included count, percentages, means, ranges, standard deviations, and analysis of variance. In addition, bar graphs were used to visually depict the information. The information was analyzed to determine if ownership or accessibility to a computer resulted in a statistically significant difference in attitude toward computers and computer based education from those who do not own or have access to a personal computer. Demographic information collected during the survey was also compared to responses to determine if other factors might affect attitudes.

Generalizations and/or Predictions

The findings of the study were generalized to the target population of 1715 graduate students at OSU.

Information Collected

The information necessary for this study was divided into the areas of demographic information, computer accessibility information, and attitude information.

Demographic Information

The demographic information requested from the participants in the study was:

Age

Ethnic Group

Sex

Education Level

Degree Program

Grade Point Average (at time of study)

Annual Income (family)

This information was used to determine if demographic groupings of the participants affected the participant attitudes toward computers or computer based instruction.

Computer Accessibility Information

The information requested on computer accessibility was:

Does the participant own a personal computer? If so, how long has the computer been owned?

Does the participant have access to a computer? If so, is it at home, work, library, or other location?

Has the participant participated in a class where a computer was used for part or all of the instruction?

This information was used to determine if ownership or accessibility of computers and familiarity with computer

based instruction affected the participant attitudes toward computers and computer based instruction.

Attitude Information

The information on graduate student attitudes toward computers and computer based instruction was determined from responses to the twenty statements about computers and computer based instruction developed for the survey instrument (Appendix A). A Likert type scale was used to allow the participant a range of response from strong agreement to strong disagreement.

The attitude statements in the survey instrument were grouped into 10 statements pertaining to computers and 10 statements pertaining to computer based instruction. The results of the survey were based on the total Likert Scale numerical response of the subjects in each of these areas.

Statements Intended to Measure Attitudes About Computers. The following statements were grouped for an analysis of participants response to computers in general:

Number	Item Description
1.	Computers are a valuable tool for the graduate student.
3.	Using computers makes completing out of class assignments more difficult.
7.	Computers are easy to use.
10.	Computers save time in preparing class assignments.
11.	Anyone can learn to use a computer.

Number	Item Description
14.	It is easier for children to learn to use computers than it is for adults.
15.	I use processing programs like word processing, spread sheet, and database programs more than game programs on the computer.
17.	Price decreases have brought computers within the price range of most people.
18.	Computer skills enhance an employee's value to an employer.
19.	Adults need more training in computer skills.

Statements Intended to Measure Attitudes About Computer-based Instruction. The following statements were grouped for an analysis on participants responses on computer based instruction:

Number	Item Description
2.	Computer-based instruction decreases the amount of time required for instruction.
4.	Adult students score lower on tests when computers are used to assist learning.
5.	Subject comprehension is improved through computer-based instruction.
6.	Computer-based instruction allows me to work at my own pace.
8.	Computer-based instruction is most applicable in science and technology.

Number	Item Description
9.	Computer-based instruction enhances understanding of the subject.
12.	Computer-based instruction is a good tool for job related training.
13.	Computer-based instruction allows the instructor to provide more individual attention to the student.
15.	I would choose a class enhanced with computer tutorials over a class without computer tutorials.
20.	Computers are more applicable in my field of education than others.

Data Management

The participant's responses to the statements in the survey instrument were recorded on a Likert scale with a response range from 1 to 5 with 1 being strongly agree and 5 being strongly disagree. Questionnaire statements 3 and 4 were negative statements and the participant's response scales were inverted to keep the consistency of the data.

CHAPTER IV

FINDINGS

Introduction

The average participant in the survey was between the age of 31 and 35 with a family income between 30,000 and 35,000 dollars. The mean GPA of the group was 3.524. 164 of the 283 participants owned a computer and 200 of the participants had taken a class where computers were used for all or part of the instruction. 148 of the participants were male and 135 were female.

Attitudes Toward Computers

The responses to the 10 statements about computers indicated a positive overall attitude. The possible response range was from a most favorable attitude = 1.000 to a least favorable attitude = 5.000. The mean response of all 283 participants was clearly favorable at 1.963. Table II shows the descriptive statistics for the total responses of all participants to the statements about computers.

In the following tables, N = number of responses, MIN = lowest total score on the 10 statements divided by 10, MAX = the highest total score on the 10 statements divided by 10, and SD = standard deviation.

TABLE II

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS

Variable	N	MIN	MAX	MEAN	SD
TOTAL ATTITUDE	283	1.000	3.600	1.963	0.424

The mean responses when grouped by demographic data ranged from a high of 2.108 to a low of 1.743. The individual demographic groupings were further studied as described below.

Computer Ownership

The participants were asked to indicate whether they owned a computer or not. Those who owned a computer were further asked to indicate the length of time they had owned a computer. Table III lists the descriptive statistical results of the survey to include results by length of computer ownership. The attitude of the 164 participants who owned a computer was more favorable toward computers than the attitude of the 119 participants who did not own a computer. The length of time an individual had owned a computer did not affect their attitude towards computers as is shown later in the study.

TABLE III

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON COMPUTER OWNERSHIP

Variable	N	MIN	MAX	MEAN	SD
OWNERSHIP OF COMPUTER					
NO	119	1.300	3.500	2.073	0.380
YES	164	1.000	3.600	1.884	0.437
LENGTH OF OWNERSHIP					
1 YEAR	29	1.200	3.200	2.000	0.483
2 YEARS	28	1.400	3.600	2.000	0.489
3 YEARS	40	1.000	2.800	1.838	0.420
4 OR MORE	67	1.100	2.900	1.812	0.389

Access to computers

The participants were asked if they had access to a computer and, if so, where the computer was located. The responses to this question were interesting as every student attending Oklahoma State University has access to a computer through facilities on campus in Stillwater or at the University Center at Tulsa. 12 of the 283 participants indicated that they did not have access to a computer. The attitude of the participants toward computers was not affected by access to a computer. Table IV lists the descriptive statistical results of the survey question on access to a computer.

TABLE IV

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON ACCESS TO A COMPUTER

Variable	N	MIN	MAX	MEAN	SD
ACCESS TO COMPUTER					
NO	12	1.300	3.500	1.975	0.583
YES	271	1.000	3.600	1.963	0.416

Computer Class

The participants were asked if they had participated in a class where a computer was used for part or all of the instruction. 83 of the participants had not participated in a class where computers were used and 200 participants had been in a class where computers were used. Participation in this type of instruction did not affect their attitude toward computers. Table V lists the descriptive statistical results of the survey question on participation in a class where computers were used.

TABLE V

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON PARTICIPATION IN A COMPUTER CLASS

Variable	N	MIN	MAX	MEAN	SD
HAD CLASS USING COMPUTER					
NO	83	1.200	3.600	2.002	0.411
YES	200	1.000	3.500	1.947	0.429

Age and Sex

Table VI lists the descriptive statistical results of the survey questions on the age and sex of the participant. As will be shown later in the study, the age or sex of the participant had no affect on the participant's attitude toward computers.

TABLE VI

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON AGE AND SEX OF THE PARTICIPANT

Variable	N	MIN	MAX	MEAN	SD
AGE					
20-25	66	1.400	3.500	2.009	0.367
26-30	57	1.200	3.000	1.914	0.384
31-35	55	1.200	3.600	2.000	0.486
36-40	36	1.200	3.300	2.006	0.477
41-45	41	1.000	2.900	1.934	0.453
46-50	21	1.200	2.600	1.843	0.379
51+	7	1.300	2.500	1.957	0.408
SEX					
MALE	148	1.200	3.200	1.949	0.413
FEMALE	135	1.000	3.600	1.979	0.436

Race

The participants were asked to indicate their race or ethnic origin. Table VII lists the descriptive statistical results of the survey question on the race of the participant.

TABLE VII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON THE RACE OF THE PARTICIPANT

Variable	N	MIN	MAX	MEAN	SD
RACE					
CAU	220	1.000	3.600	1.974	0.436
AMER IND	5	1.100	2.400	1.840	0.488
AFRICAN AMER	16	1.500	2.900	1.950	0.358
ORIEN	21	1.200	2.700	1.943	0.402
HISP	7	1.200	2.100	1.743	0.299
OTHER	14	1.500	2.800	2.000	0.368

GPA

The participants were asked to indicate their current grade point average. The responses were grouped into ranges of less than 3.0, 3.0 through 3.499, 3.5 through 3.749 and 3.75 through 4.0. Table VIII lists the descriptive statistical results of the survey question on the grade point average of the participant.

TABLE VIII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON THE GPA OF THE PARTICIPANT

Variable	N	MIN	MAX	MEAN	SD
GPA					
<3.0	8	1.500	2.700	2.063	0.431
3.0-3.499	74	1.100	3.500	1.969	0.457
3.5-3.749	70	1.200	3.000	1.911	0.402
3.75-4.0	131	1.000	3.600	1.982	0.417

Income

The participants were asked to indicate their annual family income ranges. Table IX lists the descriptive statistical results of the survey question on the average annual family income of the participant. As will be shown later in the study, the family income level had no affect on the attitude of the participant toward computers.

TABLE IX

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTERS BASED ON INCOME OF THE PARTICIPANT

Variable	N	MIN	MAX	MEAN	SD
INCOME					
UNDER 20,000	77	1.300	3.500	1.948	0.400
20-25,000	25	1.300	3.200	2.000	0.448
25-30,000	13	1.200	2.900	2.108	0.507
30-35,000	29	1.100	2.900	1.941	0.439
35-40,000	37	1.400	3.300	2.019	0.419
40-45,000	14	1.000	2.700	2.029	0.520
45-50,000	20	1.300	2.800	1.950	0.368
50-55,000	17	1.200	2.800	1.894	0.459
OVER 55,000	51	1.200	3.600	1.914	0.416

Attitudes Toward Computer-based Instruction

The total responses to the 10 statements about computer-based instruction also indicated a positive overall attitude. The possible response range was from a most

favorable attitude = 1.000 to a least favorable attitude = 5.000. The mean response of all 283 participants was 2.565. The mean responses when grouped by demographic responses ranged from a high of 2.764 to a low of 2.276. Table X lists the descriptive statistical results of the survey to include results by demographic groupings.

TABLE X

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION

Variable	N	MIN	MAX	MEAN	SD
TOTAL ATTITUDE	283	1.200	4.100	2.565	0.472

The mean responses when grouped by demographic data ranged from a high of 2.108 to a low of 1.743. The individual demographic groupings were further studied as described below.

Computer Ownership

The participants were asked to indicate whether they owned a computer or not. Those who owned a computer were further asked to indicate the length of time they had owned a computer. Table XI lists the descriptive statistical

results of the survey to include results by length of computer ownership. The ownership or length of ownership of a computer had no affect on the participant's attitude toward computer-based instruction.

TABLE XI

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON COMPUTER OWNERSHIP

Variable	N	MIN	MAX	MEAN	SD
OWNERSHIP OF COMPUTER					
NO	119	1.200	3.500	2.518	0.467
YES	164	1.200	4.100	2.599	0.474
LENGTH OF OWNERSHIP					
1 YEAR	29	1.200	4.100	2.572	0.559
2 YEARS	28	2.000	3.500	2.764	0.365
3 YEARS	40	1.600	3.400	2.455	0.449
4 OR MORE	67	1.300	4.000	2.627	0.345

Access to computers

The participants were asked if they had access to a computer and, if so, where the computer was located. The attitude of the participants toward computer-based instruction was not affected by access to a computer. Table XII lists the descriptive statistical results of the survey question on access to a computer.

TABLE XII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON ACCESS TO A COMPUTER

Variable	N	MIN	MAX	MEAN	SD
ACCESS TO COMPUTER					
NO	12	1.200	3.300	2.300	0.562
YES	271	1.200	4.100	2.577	0.465

Computer Class

The participants were asked if they had participated in a class where a computer was used for part or all of the instruction. Table XIII lists the descriptive statistical results of the survey question on participation in a class where computers were used.

TABLE XIII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON A COMPUTER CLASS

Variable	N	MIN	MAX	MEAN	SD
HAD CLASS USING COMPUTER					
NO	83	1.700	3.400	2.667	0.367
YES	200	1.200	4.100	2.523	0.504

The attitude of the 200 participants who had participated in a class using a computer was more favorable toward computer-based instruction than the attitude of the 119 participants who had not participated in a class using a computer.

Sex

Table XIV lists the descriptive statistical results of the survey questions on the sex of the participant. As will be shown later in the study, sex of the participant had no affect on the participant's attitude toward computer-based instruction.

TABLE XIV

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON SEX

Variable	N	MIN	MAX	MEAN	SD
SEX					
MALE	148	1.200	4.100	2.545	0.486
FEMALE	135	1.200	3.800	2.587	0.457

Age

Table XV lists the descriptive statistical results of the survey questions on the age of the participant. The age the participant had no affect on the participant's attitude

toward computer-based instruction.

TABLE XV

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON AGE AND SEX

Variable	N	MIN	MAX	MEAN	SD
AGE					
20-25	66	1.400	3.500	2.650	0.443
26-30	57	1.200	4.100	2.489	0.493
31-35	55	1.600	3.600	2.513	0.400
36-40	36	1.200	4.000	2.589	0.539
41-45	41	1.300	3.800	2.651	0.523
46-50	21	1.600	3.000	2.424	0.415
51+	7	2.200	3.400	2.586	0.527

Race

The participants were asked to indicate their race or ethnic origin. Table XVI lists the descriptive statistical results of the survey question on the race of the participant. The race of the participant did have an affect on the attitude of the participant. The attitudes of the minority races were more favorable toward computer-based instruction than the attitude of Caucasians.

TABLE XVI

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON RACE

Variable	N	MIN	MAX	MEAN	SD
RACE					
CAU	220	1.200	4.100	2.613	0.469
AMER IND	5	2.100	3.100	2.560	0.358
AFRICAN AMER	16	2.000	3.100	2.506	0.328
ORIEN	21	1.200	3.100	2.276	0.462
HISP	7	1.900	3.500	2.557	0.565
OTHER	14	1.700	3.400	2.321	0.506

GPA

The participants were asked to indicate their current grade point average. Table XVII lists the descriptive statistical results of the survey question on the grade point average of the participant. The GPA of the participant had no affect on the attitude toward computer-based instruction.

TABLE XVII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON THE GPA

Variable	N	MIN	MAX	MEAN	SD
GPA					
<3.0	8	2.200	3.500	2.713	0.409
3.0-3.499	74	1.400	3.600	2.507	0.479
3.5-3.749	70	1.200	3.500	2.517	0.475
3.75-4.0	131	1.200	4.100	2.615	0.468

Income

The participants were asked to indicate their annual family income range. Table XVIII lists the descriptive statistical results of the survey question on the average annual family income of the participant. As will be shown later in the study, the family income level had no affect on the attitude of the participant toward computer-based instruction.

TABLE XVIII

DESCRIPTIVE STATISTICS ON ATTITUDE TOWARD COMPUTER-BASED INSTRUCTION BASED ON INCOME

Variable	N	MIN	MAX	MEAN	SD
INCOME					
UNDER 20,000	77	1.200	4.100	2.510	0.514
20-25,000	25	2.000	3.600	2.616	0.399
25-30,000	13	1.500	3.100	2.608	0.395
30-35,000	29	1.600	3.500	2.583	0.522
35-40,000	37	1.300	4.000	2.622	0.506
40-45,000	14	1.600	3.100	2.507	0.367
45-50,000	20	1.400	3.200	2.685	0.477
50-55,000	17	1.200	3.100	2.367	0.413
OVER 55,000	51	1.400	3.800	2.592	0.488

Analysis of Data

The Analysis of Variance (ANOVA) technique was used to determine the significance of response between the demographic variables and attitude variables. These

findings are shown in Table XIX.

TABLE XIX

ANALYSIS OF VARIANCE RESULTS

Demographic Variables	Computers P	Computers Significance	Computer-based Instruction P	Computer-based Instruction Significance
OWNERSHIP	0.000	S	0.158	NS
YEARS OWNED	0.097	NS	0.058	NS
ACCESS	0.988	NS	0.460	NS
COMPUTER CLASS	0.317	NS	0.018	S
AGE	0.652	NS	0.267	NS
RACE	0.761	NS	0.014	S
SEX	0.545	NS	0.462	NS
GPA	0.628	NS	0.255	NS
INCOME	0.859	NS	0.609	NS

The difference in attitudes were significant ($p \leq .05$) in the following:

1. Ownership vs attitude toward computers,
2. Participation in a class where computers were used for all or part of the instruction vs attitude toward computer-based instruction, and
3. Race vs attitude toward computer-based instruction.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Resistance to change and adaptation to rapidly expanding technology have been well documented obstacles in education for adult learners. The increased use of computers and computer-based instruction to offset the rising costs of education, and the increasing number of adults returning to the classroom are factors of concern to curriculum developers. The study was conducted to determine the attitudes of adult graduate students towards computers and computer-based instruction, and whether these attitudes were affected by ownership or access to a computer or other demographic information.

Conclusions

General Attitudes

The general attitude of the adult graduate student in this study toward computers and computer-based instruction was favorable. Table XX summarizes these attitudes. These attitudes indicate that the expanded use of computers and computer-based instruction in the adult graduate student

curriculum may be a viable approach to reducing the cost of higher education as well as expanding the effectiveness of the instructor with a higher student to teacher ratio.

TABLE XX

DESCRIPTIVE STATISTICS ON ATTITUDES

Variable	N	MIN	MAX	MEAN	SD
ATTITUDE ON COMPUTERS	283	1.000	3.600	1.963	0.424
ATTITUDE ON COMPUTER-BASED INSTRUCTION	283	1.200	4.100	2.565	0.472

Attitude Toward Computers

The study showed that only one demographic variable affected the attitude of the participant toward computers. This variable was whether the participant owned a computer or did not own a computer. The chart in figure 1 shows that the individual who owned a computer had a lower mean score indicating a more favorable attitude.

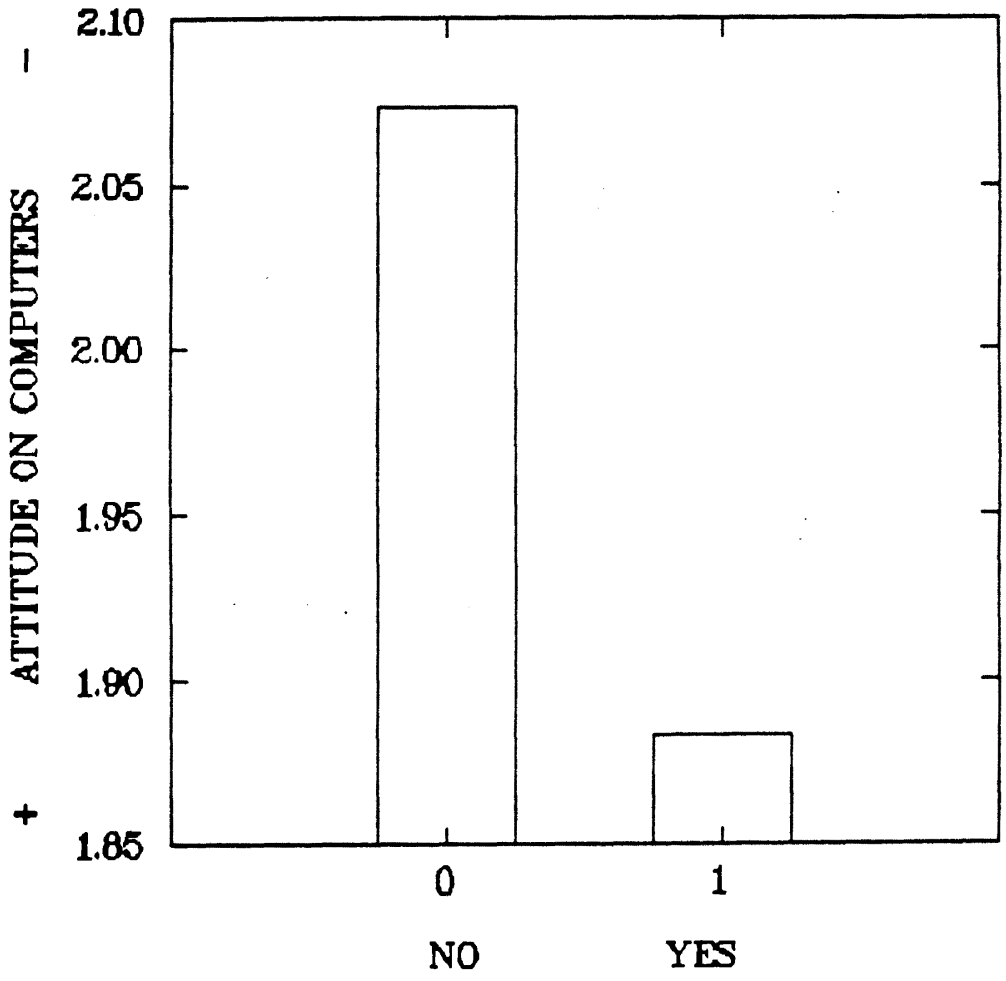

Figure 1. Attitudes Toward Computers by Ownership

Attitude Toward Computer-based Instruction

There were two demographic areas in the study which showed significant impact on the attitude of the participant toward computer-based instruction. These factors were the race of the participant and whether the participant had taken a class where computers were used for all or part of the instruction.

Race. Figure 2 shows the relationship of the race of the participant to his attitude toward computer-based instruction. The attitude of all minority races was more favorable than the attitude of Caucasians. The most favorable attitude was in the Orientals followed by the "other" category, African American, Hispanic, and American Indian in order. These results could be indicative of the minority viewing computer-based instruction as an aid to overcoming perceived disadvantages.

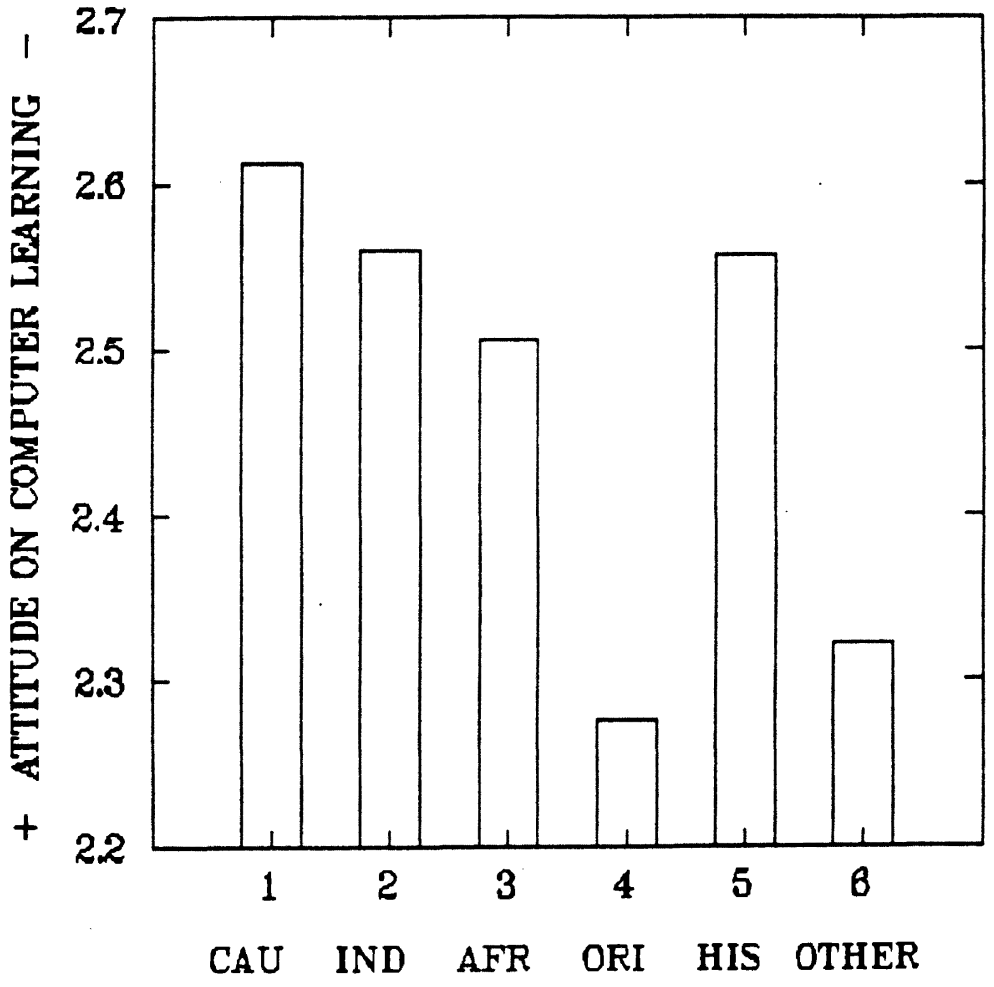

Figure 2 Attitude Toward Computer Based Instruction by Race

Computer Classes. The most interesting result shown by the study was the effect on the attitude toward computer-based instruction when the respondent had participated in a class where a computer was used for all or part of the instruction. Figure 3 shows the attitude score of the participant based on attendance in a class where computers were used.

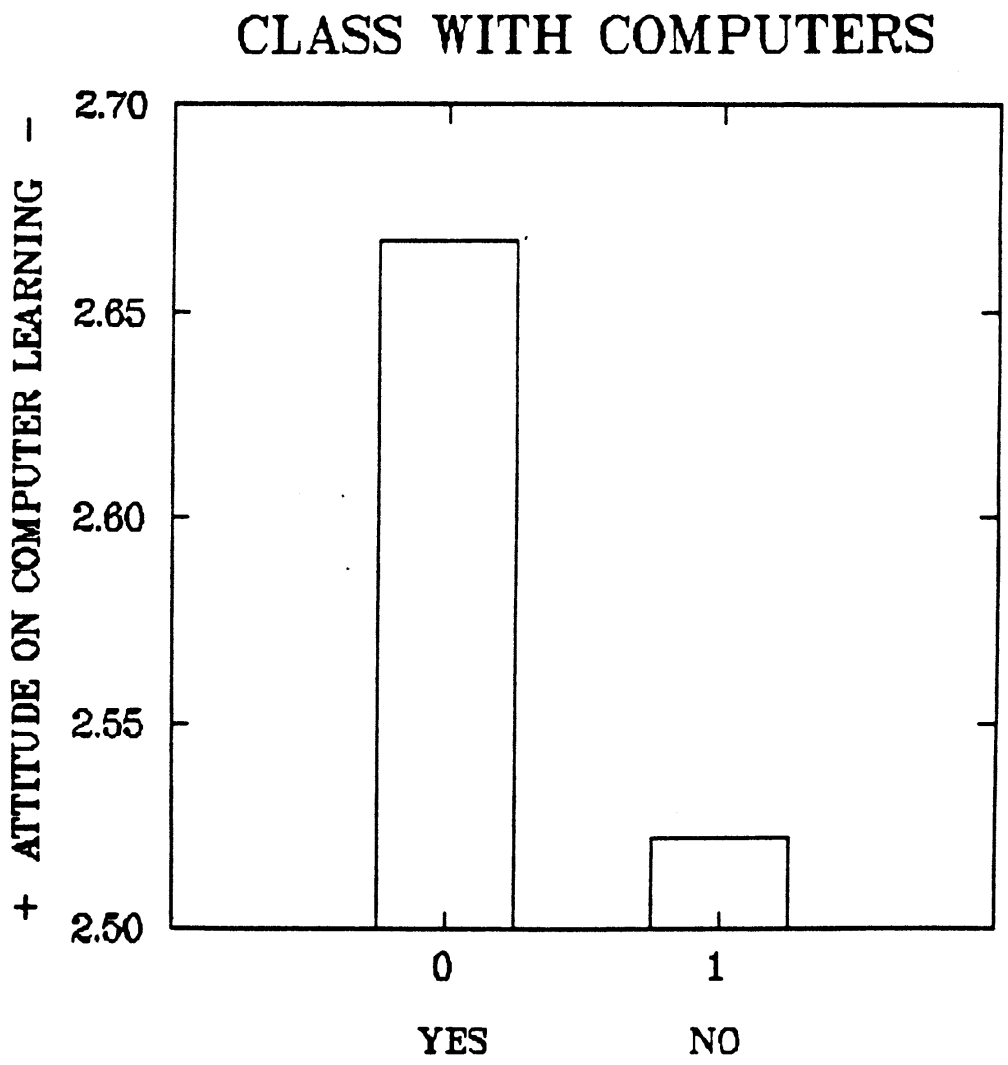

Figure 3. Attitude Toward Computer Based Instruction by Computer Class

Recommendations

The use of computers is expanding to all facets of society. Institutions of higher education will be remiss if the graduate is not familiar with computers and their applicability to the field of study. Based on the improved attitude toward computers when the individual owns a computer, students should be required to own a computer. This ownership could be accomplished through issuing a computer to all students and including the cost in the initial enrollment fee. This increased ownership could improve the attitudes of the students and allow a greater acceptance of computers in the classroom. It could also allow the networking of student and faculty computers to the central library making research and reference materials more available.

The use of computer-based instruction increases the effectiveness of the instructor and the amount of time he can devote to individual students (Kulik, Kulik, & Shwalb; 1985). Based on the significant improvement in attitude when the participant had attended a class where computers were used, the curriculum developer should consider a computer orientation class an essential part of every curriculum. At a minimum, such a class would provide the learner with a knowledge of software development and uses in his field of study. This class could also enhance the attitude of the minority student and his perceived disadvantage in the educational environment.

Further research in this area is indicated to determine if the attitudes found in the adult graduate student at OSU is indicative to the total population of adult graduate students. Before and after studies in the areas of computer ownership and participation in classes utilizing computers would be beneficial in determining the degree of attitudinal change in the participant.

BIBLIOGRAPHY

"A Teacher Named PLATO: Computer-Assisted Instruction," (1979) Research & Creative Activity at Indiana University, Bloomington, Vol II, Number 2.

Bailey, Charles; Rentz, William D., (1989) The Center for Advancing Technology Succeeds with New Literacy Program, Piedmont Community College, Yanceyville, NC., Center for Advancing Technology.

Barton, Anthony, (1983) "Teaching University Graduates To Use The Microcomputer To Present Programmed Instruction," Improving University Teaching. Volume II and Volume III: Contributed Papers. International Conference (9th, Dublin, Ireland, July 6-9, 1983). Maryland University, College Park University College; National Institute for Higher Education, Dublin (Ireland).

Clayborne, B. Mawiyah, The Relationship Between the Attitudes of Urban Students and Mothers Towards Computers. (unpublished Ph.D. Thesis, University of Maryland, 1988)

Cleland, Sherrill, (1983) "To Expand On-campus Computer Instruction Across the Curriculum. Encourage Home Computers--A Case Study of a Liberal Arts College," Improving University Teaching. Volume II and Volume III: Contributed Papers. International Conference (9th, Dublin, Ireland, July 6-9, 1983). Maryland University, College Park University College; National Institute for Higher Education, Dublin (Ireland).

Cambre, Marjorie A. and Cook, Desmond L.; (1985) "Computer Anxiety: Definition, Measurement, and Correlates," Journal of Educational Computing Research, Vol. 1(1), pp. 37-54.

Cross, Patricia K. (1988) Adults as Learners, San Francisco, Jossey-Bass Publishers.

Delpierre, Georges (1983) "Computer-Managed Instruction At University Level," Improving University Teaching. Volume II and Volume III: Contributed Papers. International Conference (9th, Dublin, Ireland, July 6-9, 1983). Maryland University, College Park University College; National Institute for Higher Education, Dublin (Ireland).

Dukes, Richard L., Discenza, Richard, and Couger, J. Daniel; (1984) "Convergent Validity of Four Computer Anxiety Scales," Educational and Psychological Measurement, 49, pp. 195-203.

Ewing, Jeanne B.; Ewing, Mary E.; London, Jack; & Ramirez-Ponce; (1986) "Adult Education and Computer Literacy: A New Challenge," Lifelong Learning: An omnibus of practice and research, Vol. 10, No.3, pp. 21-23

Kulik, Chen-Lin C.; Kulik, James A.; and Shwalb, Barbara J. (1985) Effectiveness of Computer-Based Education. Center for Research on Learning and Teaching, The University of Michigan. (Research presentation to the annual meeting of the American Educational Research Association, Chicago, March 1985) ERIC Document Reproduction Service No. ED 263 888.

Maurer, Matthew M. and Simonson, Michael R. (1984) Development and Validation of a Measure of Computer Anxiety. (Research paper presented at the Annual Meeting of the Association for Educational Communications and Technology, Dallas, Texas, January 20-24, 1984) ERIC Document ReproductionService No. ED 243 428.

Paquin, David C. A Computer-Based Training Program for the Development of Student Handouts and Other Training Aids. (unpublished MS Thesis, New York Institute of Technology, 1989). ERIC Document Reproduction Service No. ED 309 324.

Rickards, Joseph M., (1983) Multiple Option Instructional Program for Adult High School Completers, Garfield County School District, Panguitch, Utah.

Russell, William E., (1983) "Stages of Computer-assisted Instruction," Improving University Teaching. Volume II and Volume III: Contributed Papers. International Conference (9th, Dublin, Ireland, July 6-9, 1983). Maryland University, College Park University College; National Institute for Higher Education, Dublin (Ireland).

Slimmer, Virginia M. and Payne, Judith S., (1983) "Developing In-service Computing Literacy Workshops: The Role of the University Instructor," Improving University Teaching. Volume II and Volume III: Contributed Papers. International Conference (9th, Dublin, Ireland, July 6-9, 1983). Maryland University, College Park University College; National Institute for Higher Education, Dublin (Ireland).

Smith, Carol E., (1981) "Discrepancy Evaluation of the Cognitive and Affective Outcomes of Computer-assisted Instruction," Proceedings of the Annual Adult Education Research Conference (22nd,, DeKalb, Illinois, April 1-3, 1981), Northern Illinois Univ., DeKalb. Office of Education Research, pp. 205-210.

Zellermayer, Michal; Salomon, Gavriel; Globerson, Tamar; and Givon, Hanna. (1991) "Enhancing Writing-related Metacognitions Through a Computerized Writing Partner". American Educational Research Journal, Vol. 28, No. 2, Summer 1991, pp.373-391.

APPENDIXES

APPENDIX A

OPINION SURVEY ON COMPUTER UTILIZATION

OPINION SURVEY ON COMPUTER UTILIZATION

PERSONAL INFORMATION

NAME (optional) _____ ADDRESS (optional) _____

PHONE (optional) _____

COMPUTER ACCESSIBILITY

1. Do you own a personal computer? ( )YES ( )NO

   If yes, how long have you owned a computer? ( )less than 1 year
   ( )1-2 years
   ( )2-4 years
   ( )over 4 years

2. Do you have access to a computer? ( )yes ( )no

   If yes, is the computer at (choose one or more) ( )home
   ( )work
   ( )library
   ( )other_____
   (describe location)

3. Have you participated in a class where a computer was used for part or all of the instruction? ( )YES ( ) NO

DEMOGRAPHIC INFORMATION

AGE ( )20-25 ( )26-30 ( )31-35 ( )36-40 ( )41-45 ( )46-50 ( )51+

RACE/ETHNIC GROUP ( )CAU ( )AMER IND ( )BLACK ( )ORIEN ( )HISP ( )OTHER

SEX ( )MALE ( )FEMALE

HIGHEST DEGREE HELD _____ GRANTING INSTITUTION _____ MAJOR FIELD OF STUDY _____

CURRENT DEGREE PROGRAM _____ MAJOR FIELD OF STUDY _____ CURRENT GRADE POINT AVERAGE _____

AVERAGE ANNUAL FAMILY INCOME ( )UNDER 20,000 ( )20-25,000 ( )25-30,000
( )30-35,000 ( )35-40,000 ( )40-45,000
( )45-50,000 ( )50-55,000 ( )Over 55,000

OPINION SURVEY ON COMPUTER UTILIZATION

Place an "X" in the column that best matches your opinion.

SA = Strongly Agree A = Agree N = No Opinion D = Disagree SD Strongly Disagree

	SA	A	N	D	SD
EXAMPLE					
1. My family uses the computer more than I do.	( )	( )	( )	(X)	( )
	SA	A	N	D	SD
1. Computers are a valuable tool for the graduate student.	( )	( )	( )	( )	( )
2. Computer-based instruction decreases the amount of time required for instruction.	( )	( )	( )	( )	( )
3. Using computers makes completing out of class assignments more difficult.	( )	( )	( )	( )	( )
4. Adult students score lower on tests when computers are used to assist learning.	( )	( )	( )	( )	( )
5. Subject comprehension is improved through computer-based instruction.	( )	( )	( )	( )	( )
6. Computer-based instruction allows me to work at my own pace.	( )	( )	( )	( )	( )
7. Computers are easy to use.	( )	( )	( )	( )	( )
8. Computer-based instruction is most applicable in science and technology.	( )	( )	( )	( )	( )
9. Computer-based instruction enhances understanding of the subject.	( )	( )	( )	( )	( )
10. Computers save time in preparing class assignments.	( )	( )	( )	( )	( )
11. Anyone can learn to use a computer.	( )	( )	( )	( )	( )
12. Computer-based instruction is a good tool for job related training.	( )	( )	( )	( )	( )
13. Computer-based instruction allows the instructor to provide more individual attention to the student.	( )	( )	( )	( )	( )
14. It is easier for children to learn to use computers than it is for adults.	( )	( )	( )	( )	( )
15. I would choose a class enhanced with computer tutorials over a class without computer tutorials.	( )	( )	( )	( )	( )
16. I use processing programs like word processing, spread sheet, and database programs more than game programs on the computer.	( )	( )	( )	( )	( )
17. Price decreases have brought computers within the price range of most people.	( )	( )	( )	( )	( )
18. Computer skills enhance an employees value to an employer.	( )	( )	( )	( )	( )
19. Adults need more training in computer skills.	( )	( )	( )	( )	( )
20. Computers are more applicable in my field of education than others.	( )	( )	( )	( )	( )

APPENDIX B

SURVEY DATA

SURVEY DATA

Statistical data for the total responses to the statements about computers and computer-based instruction on the survey instrument.

TOTAL OBSERVATIONS: 283

	Q1	Q2	Q3	Q4
N OF CASES	283	283	283	283
MINIMUM	1.000	1.000	1.000	1.000
MAXIMUM	5.000	5.000	5.000	5.000
MEAN	1.223	2.845	2.141	2.580
STANDARD DEV	0.509	0.988	1.015	0.797

	Q5	Q6	Q7	Q8
N OF CASES	283	283	283	283
MINIMUM	1.000	1.000	1.000	1.000
MAXIMUM	4.000	4.000	5.000	5.000
MEAN	2.505	2.155	2.442	3.134
STANDARD DEV	0.835	0.727	1.041	1.083

	Q9	Q10	Q11	Q12
N OF CASES	283	283	283	283
MINIMUM	1.000	1.000	1.000	1.000
MAXIMUM	5.000	5.000	5.000	4.000
MEAN	2.424	1.979	1.996	1.898
STANDARD DEV	0.853	0.960	0.917	0.689

	Q13	Q14	Q15	Q16
N OF CASES	283	283	283	283
MINIMUM	1.000	1.000	1.000	1.000
MAXIMUM	5.000	5.000	5.000	5.000
MEAN	2.633	2.523	2.664	1.774
STANDARD DEV	0.922	1.083	0.966	0.959

	Q17	Q18	Q19	Q20
N OF CASES	283	283	283	283
MINIMUM	1.000	1.000	1.000	1.000
MAXIMUM	5.000	5.000	5.000	5.000
MEAN	2.307	1.516	1.731	2.813
STANDARD DEV	1.059	0.626	0.802	1.060

VITA

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Candidate for the Degree of

Master of Science

Thesis: THE RELATIONSHIP BETWEEN THE ATTITUDE OF ADULT GRADUATE STUDENTS TOWARD COMPUTERS AND COMPUTER BASED INSTRUCTION AND THEIR OWNERSHIP OR ACCESSIBILITY OF A PERSONAL COMPUTER

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