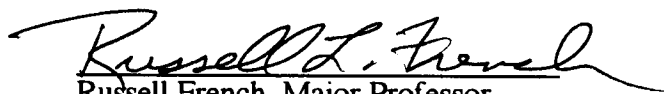


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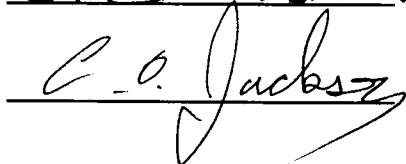
I am submitting herewith a dissertation written by Robert Stephen Kite entitled "Differences in Attitudes Toward Computers Between and Among Teachers and Parents of Elementary School Students." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.


Russell French, Major Professor

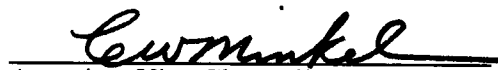
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and recommend its acceptance:







Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

DIFFERENCES IN ATTITUDES TOWARD COMPUTERS
BETWEEN AND AMONG TEACHERS AND PARENTS
OF ELEMENTARY SCHOOL STUDENTS

A Dissertation
Presented for the
Doctor Of Philosophy
Degree
The University Of Tennessee, Knoxville

Robert Stephen Kite
December 1995

DEDICATION

This dissertation is dedicated to my grandparents

Mr. Grover Junior Graven

and

Mrs. Esther Jeanne Graven

who have always been there through all of this.

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There are a number of people whom I am grateful for making my Time at The University of Tennessee so productive and insightful. Through my contact and discourse with numerous faculty, staff, and students, my knowledge of the world and understanding of mankind has greatly increased. I am particularly grateful to my Dissertation Committee, Russell French, C. Ed Roeske, Glennon Rowell and Charles Jackson for their willingness to motivate me when deadlines were approaching. Russell French and Ed Roeske have especially benefited me and this dissertation through constant revisions and endless support of this study.

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The greatest debt of gratitude is owed to my wife, Darcy. Without her support and constant encouragement I never could have met this challenge and completed this degree.

ABSTRACT

This descriptive study of 229 parents and teachers of elementary school students at Oneida Elementary School was designed to assess their attitudes toward computers as revealed on the Adult Attitudes Toward Computers Scale (ATC) developed by Lewis and Delcourt (1987) at the University of Connecticut. The purpose of this research was to evaluate the relationship of these attitudes to age, gender and experience with computers and to further determine whether there is a relationship between these attitudes and the implementation of computers in the elementary school. It was hypothesized that attitudes may vary by age, gender, and the amount of experience with computers of the respondent.

Five-hundred and fifty-five subjects (parents and teachers) were identified from the school population that met the research criteria. Each subject had to be associated with the educational activities at Oneida Elementary School. This number included all teachers and instructional staff. All 555 subjects received a questionnaire and a demographics sheet. Of the 555 subjects, 200 parents and 29 instructional staff returned their surveys completed.

Descriptive statistics were used in treating all data collected. Means and medians were utilized as measures of central tendency and standard deviations were used to identify variations. In order to determine whether certain demographic variables could explain any variations in responses to the Total ATC score and subscores, one-way analysis of variance was employed. The test for Honestly Significant Differences (HSD) was employed. An alpha level of .05 was established.

After all data from the questionnaire were coded, the information was entered on separate spreadsheets for teachers and parents and imported into the JMP statistical software package. Also, ANOVAs were computed for each group to determine differences in attitudes based on age, gender, and the amount of experience with computers. If the results indicated no significant differences based on age, gender, and amount of experience with computers on the Total ATC, no further statistical analyses were computed. As all teachers responding were female, no descriptive statistical analyses based on gender were conducted for teachers. After determining whether the attitudes of respondents were positive or negative based on the ATC, the findings were compared with those presented in other studies which were discussed in the review of literature. It was found in this study that the attitudes of those involved in the introduction of technology effect the success or failure of that introduction.

Three demographic variables were studied in relation to Total ATC score on the ATC. As none of the analysis of variance testing revealed any significant differences, among or between teachers and parents based on gender, age, or level of experience with computers, in relation to the Total ATC, null hypotheses were supported except numbers two and eight. As all teacher respondents were female, it was not possible to test for gender differences between teachers and parents. All statistical testing revealed that teachers and parents both held positive attitudes toward computers regardless of age, gender, or their level of experience with computers.

As this study found that both parents and teachers had positive attitudes toward computers, it is reasonable to assume that the introduction of computers at Oneida Elementary School will be successful.

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CHAPTER I

INTRODUCTION

Reform, change, innovation; these are terms that many educators use. But what do they mean? These terms, of course, mean different things to different people. Many people may refer to these terms as if they were synonymous. Reform and innovation imply the evolution from a lesser valued point to a more valued point. However, change has no such value associated with it. Change is change; for better or worse, it is what it is. The tearing down of one school building and building another on the same location is change, but it is changing from a static existence to another static existence, thus only slightly evolving. Only the structure has changed, not the values of the people attending. However, getting the people involved in the education of their children and having the people decide that a new structure would better serve the new needs of their children implies changing dynamically from a static existence to the unknown. This change implies a realization that current values need to be adjusted or discarded to better prepare the children of the community for the future. Although the scrapping and rebuilding of schools may seem a dramatic example of change, that is exactly what has been and is occurring in Oneida, Tennessee (Persig, 1991).

Change as we know it, is a sometimes slow and aggravating process. This is particularly true in schools that are nestled in the safe and conservative foothills of the Appalachian mountain range. Change can also be a dynamic force that causes communities to separate and take sides to maintain their static nature. The Oneida Special School District is one school district isolated from urban influence that is

currently going through a process of change. The study of a single case during a specific period, whether or not it is representative of the larger effort to reform the schools, provides insight into how change can be effected, and the problems associated with the effort to effect change.

Statement of the Problem

The problem being addressed in this study can best be presented as a question, "How do the attitudes of parents and teachers toward computer technology relate to the successful introduction of computers into the classroom?" Few systematic studies have been conducted in the public schools of America to measure the attitudes of parents and teachers toward computers in the classroom and the relationship of those attitudes to the successful introduction of computers into the classroom. Further, there have been no studies of this type conducted in rural America at all. In fact, there has been only one study conducted in the United States in the last eight years that addresses the problem (Davidson and Ritchie, 1994b). Of the four studies identified that compared the attitudes of teachers and parents toward computers, all but one were conducted in foreign countries. In addition, only one study even remotely included the relationship of the attitudes of parents and teachers and the successful introduction of computers in the classroom (Davidson and Ritchie, 1994b). In a country that relies on technology and computers for many day-to-day activities, it seems unconscionable that more studies have not been conducted to determine how people associated with the education of the children of America feel about computers in the classroom.

Purpose

The purpose of this study was to evaluate the relationship of attitudes toward computers to age, gender, and experience with computers and to further determine whether there was a relationship between these attitudes and the implementation of computers in Oneida Elementary School in Oneida, Tennessee. In this study the attitudes of the teachers and parents of students at Oneida Elementary School toward computers were measured and the relationship of these attitudes to several variables (age, gender, and amount of experience with computers) was evaluated to determine whether a relationship exists between attitudes toward computers and their successful introduction into the classroom. Attitudes were measured by scores on the Adult Attitudes Toward Computers Scale which has subscores in the attitude categories of General Interest, Usefulness, and Comfort.

Hypotheses

1. There are no significant differences by age group among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
2. There are no significant differences by gender among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
3. There are no significant differences by level of experience among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

4. There are no significant differences by age group among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

5. There are no significant differences by gender among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

6. There are no significant differences by level of experience among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

7. There are no significant differences by age group between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

8. There are no significant differences by gender between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

9. There are no significant differences by level of experience between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

Need for the Study

To date, only a handful of studies have been conducted on the introduction of computers into the classroom that include the attitudes of parents. The vast majority of studies focusing on the introduction of computers in the classroom have focused on the teachers and the students. It is my belief that society in general and

especially parents should be surveyed to determine whether parents and teachers share the same attitudes toward computers in the classroom. It is, after all, the attitudes of parents that affect their children the most. For example, if parents do not feel that computer usage is important, it is likely that they will make that belief known to their children and reinforce that belief through actions and statements that lead their children to be influenced by those attitudes. No matter how hard teachers and other school officials might try to introduce ideas new to the student, those students may still go home and maintain the ideas and attitudes of their parents (Kristiansen, 1991; Davidson & Ritchie, 1994a; Davidson & Ritchie, 1994b; and Coleman, 1966). Therefore, it is necessary to the successful introduction of computers in the classroom, that parents and teachers share the same attitudes and that those attitudes be positive toward the introduction of computers in the classroom (Davidson & Ritchie, 1994b).

Limitations

Attitudes for this population are measured on the Adult Attitudes Toward Computers (ATC) developed by Lewis and Delcourt (1988) at the University of Connecticut. The reliability of this instrument has been established at .90 (General Interest), .82 (Usefulness), .89 (Comfort), with an overall value of .87 for the entire questionnaire. Attitudes in this study are limited to those in the Lewis and Delcourt instrument. Specifically, the attitudes studied are General Interest, Usefulness and Comfort. The General Interest factor measures the level of enthusiasm toward the topic of computers and the level of interest in finding out more about computers. Respondents scoring high on the Usefulness scale would

hold the belief that computers would be helpful to them in the future. The Comfort scale assesses the level of anxiety an individual may have when using or talking about computers (Lewis & Delcourt, 1988).

The setting of this study is also a limiting factor. A school system such as Oneida, preparing to utilize computers in its instructional program needs to know if efforts to change attitudes must precede introduction of the technology. At the time of this study, all teachers had computers on their desks. However, few of these teachers were actually using the computers. The computers were physically in the building, though, not being used.

Because of the voluntary nature of this sample, results cannot be generalized to a population. The lack of empirical studies on the relationship between the attitudes of parents and teachers in regard to computers does, however, justify an exploratory study.

Delimitations

This study focuses only on the Oneida Elementary School; its staff and parents. The study is further limited by a review of literature that spans the years 1987 to the present. At the time this project commenced, 1992, the limit would have been five years. However, as time progressed, so, too, did the field of educational technology. Therefore, reading and research continued to the end of June, 1995. This study is also limited by the definitions of "attitude" and "introduction" used.

Definitions

For the purpose of this study, an attitude is defined as "...a relatively long-lasting organization of a person's beliefs and feelings about, and behaviors toward, other people, situations, or objects (Smith, & Sarason, 1986, p. 586). Further, "School Community" is defined as individuals (parents, students, and school personnel) associated with the educational activities at the elementary school. The term "Introduction" is defined as the product of computers being brought in and use established in a new environment.

Organization of the Study

This study is organized into five chapters. The first chapter is comprised of the introduction which addresses the problem, purpose, need for the study, limitations and delimitations, definition of terms and the hypothesis. A discussion of the relevant literature on school change and technology is found in the second chapter. The third chapter focuses on the methodology used to meet the purposes presented in the first chapter. The findings of the study are presented in the fourth chapter with the conclusions and discussion being the fifth chapter.

CHAPTER II

REVIEW OF LITERATURE

Previous Research

A desire to determine if there was any information available describing the relationship between the attitudes of teachers and parents in regard to the introduction of computers led the investigator to conduct a review of available literature pertaining to teacher attitudes, computers, and parent-attitudes. This literature search revealed 21 studies that mentioned the attitudes of parents and teachers toward computers. However, only four studies were identified that directly focused on and discussed the attitudes of parents and teachers toward computers. Of the four studies, two presented no data specific to a single school site. The other two were studies of the same school site by the same author. In no study did parents and teachers use the same surveys. The design of this study emanated from the literature review which revealed that the relationship between parents and teachers in regard to computer attitudes had not been completely or systematically studied.

Related Research Not Included

Of the 21 studies located, only four were directly related to the purpose of this study. The other 17 focused on other areas but shared the same three descriptors (Teacher-attitude, parent-attitude, and computer). The purpose of many of these studies was to evaluate software, different teaching and learning methods that used computers or various programs that used computer-based information to obtain data (Peck & Hughes, 1994; Beyer, 1993; Childers & Leopold, 1993; McMahon &

Duffy, 1993; Beyer, 1992; Casey, 1992; Beyer, 1991; Leahy, 1991; Robinson, 1991; Sever, 1991; Whitney & Lehman, 1990; Leahy, 1989).

Shashaani (1993) investigated students' attitudes toward computers and their perceptions of parents' and teachers' attitudes toward computers in an effort to determine whether male or female students held different attitudes. In one study there was an investigation of social barriers that hinder successful entry of females into technology-oriented fields (Yeloushan, 1989). This study focused on the attitudes of parents and teachers toward females in technology-related fields and pointed out the lack of female role models in the area.

Eight studies concentrated at the effects of various computer-assisted-instruction packages (Peck & Hughes, 1994; Childers & Leopold, 1993; Beyer, 1993; Beyer 1992; Casey, 1992; Beyer, 1991; Leahy, 1991; Leahy, 1989). Among these was a study by Peck & Hughes (1994) that looked at the impact of an inquiry approach to learning in a first-grade classroom. The authors interviewed Parents, teachers and students to determine their attitudes toward changes that may have resulted from the use of classroom computers and inquiry learning. All measurements of attitudes focused on inquiry learning, not computers in general.

Francine Beyer (1993, 1992, 1991) evaluated the "CAI/Cooperative Learning Project" being conducted in partnership with two Pennsylvania school districts and Research for Better Schools. The first, second, and third-year reports evaluate the progress of this program. All attitudes surveyed focus on the attitudes of parents, teachers and students toward the program, not computers in general.

Casey (1992) Childers and Leopold (1993) and Leahy (1991, 1989) all studied the computer-based, Writing-to-Read program. Casey surveyed parents,

teachers and students in an effort to determine their attitudes toward reading and the Writing-to-Read program. Childers and Leopold conducted a follow-up study of the "ARC/IBM Writing-to-Read Project in Kentucky." This study also focused on the effectiveness of the Writing-to-Read program and the attitudes of those involved with the program. Leahy looked at the effectiveness of the Writing-to-Read program and compared the results to other standardized tests.

Whitney and Lehman (1990) studied the implementation of a commercial computer-managed instructional program by one school district. Their focus was to obtain information regarding the perceptions of teachers, parents, and administrators toward the management software.

In five studies (Ainsa, 1993; McMahon & Duffy, 1993; Robinson, 1991; Seever, 1991; Sawyer, 1987) there was an investigation of the success of specific schools or school projects. McMahon and Duffy studied the "Buddy System Project." This project loaned computers to students and teachers in elementary classrooms in an effort to determine the effects on the school's learning environment; the impact and use of the telecommunications functions; and the impact of computers on the environment in the home.

A study conducted by Ainsa (1993) reviewed research related to the use of the computer and its impact on the home, society and international educational neighbors. Ainsa reviewed three studies and found that after various training programs, parents and teachers felt positive about the use of computers in the classroom. The author did not discuss specific findings nor any of the demographics of the sample.

Robinson (1991) and Sawyer (1987) presented computer-based evaluations of specific school sites. Robinson evaluated the Martin Luther King, Jr., Latin Grammar Magnet Middle School in Kansas City. The focus of the evaluation was enrollment, program capacity, implementation, perceptions and achievement.

Sawyer studied the reactions of faculty, students, and parents toward the first year of the Thomas Jefferson High School for Science and Technology.

The last study was conducted by Seever (1991) and evaluated the summer school program of the Kansas City School District. Data were obtained for the evaluation through various computer-managed-instruction tests and computer-managed instruction data.

As can be seen, all of the above mentioned studies, although sharing the same descriptors, do not meet the purpose of this study. The four studies that do present data conducive to the completion of this investigation are discussed below.

Related Research

Hattie and Fitzgerald

The first of the four studies that were located and that addressed the attitudes of parents and teachers toward computers was conducted by Hattie and Fitzgerald in 1987. The purpose of their study was to determine whether there were differences in attitudes, achievement, and use of computers based on the sex of the individual. To meet this purpose, the authors first conducted a meta-analysis of all available literature and then conducted two separate studies. The first study looked for differences between male and female students, parents and teachers in 32 schools that had been using computers for some time. The second study looked for

the same differences but drew its population from 1,000 schools throughout Australia.

Hattie and Fitzgerald concluded that there were small differences between males and females and that these differences were related to some trends. The authors found that "the differences are greater with older students, they are greater in more recent studies, and girls appear to be more polarized in their attitudes toward computers. As many girls as boys enjoy using computers but many more girls than boys ardently dislike them"(23). Further, the authors found that 32 percent of parents and 50 percent of teachers used computers at least once a week. Of the parents, males were more likely to use computers (22 percent males, 10 percent females). The use of computers among teachers was generally equal (males 22 percent, females 28 percent). In general, all groups supported the use of computers in the schools. However, male students, female teachers, and female parents were more likely to agree that computers should be used in the schools and were less scared or uneasy with computers. Computer users, and students, parents and teachers associated with elementary schools were generally more positive about the use of computers than non-users.

Summary and Implications:

Although the study by Hattie and Fitzgerald did not completely speak to the purpose of this study, it did provide valuable insight into some of the areas that are currently being investigated as potential causes for differences in attitudes among males and females. Hattie and Fitzgerald found that parents and female teachers were more likely to support the use of computers in the school and have less

anxiety toward computers than male teachers. Further, the authors found that computer users in general and the teachers, parents, and students associated with elementary schools were generally more positive about the use of computers than non-users.

Kristiansen

A study conducted and published by Rolf Kristiansen in 1991 sought to determine whether teachers, parents and students share the same expectations and attitudes toward computers. A population of 500 teachers, 2,100 students and 800 parents was selected from a random sample of schools and was stratified according to regional and ecological variables.

Kristiansen found that of the three groups, teachers have differing views on knowledge, are less motivated and enthusiastic about their own use of computers, and appear to underestimate the "actuality and necessity" of using computers in education, as compared to parents (205). Although the author found there were differences he failed to discuss those differences in detail. The benefit of Kristiansens' study to this one is his section on teacher attitudes in previous research.

Kristiansen cites seven studies (Baack, Brown & Brown, 1991; Honeyman & White, 1987; Baylor, 1985; Elkins, 1985; Gressard & Loyd, 1985; Jones & Wall, ND; Lillard, 1985) that address the attitudes of teachers toward computers. Two studies, Gressard and Loyd (cited in Kristiansen, 1991) and Baylor (cited in Kristiansen, 1991) found that age was not a significant variable in determining attitude differences toward computers. However, Baack, et al (cited in Kristiansen, 1991) did find that older adults held less positive attitudes toward computers than

did younger adults. In addition to studies focusing on age as a variable for differences in attitude, four studies (Elkins, Jones & Wall, Lillard, and Honeyman & White, cited in Kristiansen, 1991) found that the amount of experience with computers did effect the attitudes of teachers toward computers.

Summary and Implications:

Kristiansen found that teachers are less motivated and enthusiastic about their own use of computers and the necessity of using computers in education, as compared to parents. Two studies cited by Kristiansen found there to be no difference in attitudes toward computers based on age. However, Kristiansen also notes that Baack, et al (1991) did find that older adults held less positive attitudes toward computers than did younger adults. Kristiansen further notes that the amount of experience with computers did effect the attitudes of teachers toward computers.

Davidson & Ritchie

The third study was conducted by Davidson and Ritchie (1994a). Their study focused on how the attitudes of parents, teachers, and students toward computers effected the integration and use of computers in the schools and was conducted at an elementary school in Texas. Further, they wanted to know whether the attitudes of the participants changed with the actual introduction of the computers. The study involved 475 students, 34 teachers, and 230 parents during two school years. Each group reported positive attitudes toward computers. The survey conducted during the second year indicated that attitudes improved or increased. The authors concluded that their results tended to confirm the belief that successful

implementation of technology requires a supportive environment from all involved in the school community. (1994).

Davidson and Ritchie found that 9 percent of teachers in 1991 were afraid to touch a computer. Fifteen percent of the teachers were afraid that they might harm a computer and about 33 percent of the teachers were uncomfortable with people who were knowledgeable of computers. These percentages decreased somewhat in the 1992 survey.

Parents held generally positive attitudes toward computers. Only 13 percent of the parents felt afraid to touch a computer and 94 percent felt they could learn to use a computer. Although the overall response from parents was positive, 7 to 8 percent felt uncertain or fearful of computers.

Davidson & Ritchie II

The fourth study (Davidson & Ritchie, 1994b) is an expanded version of the third study. The authors went farther in connecting the attitudes of students, parents and teachers to the successful implementation of computers in the classroom and in the presentation of the demographic data of their sample. The authors concluded that, "computers can be effectively implemented into the classroom when student, teacher, and parent attitudes remain positive and anxieties, low"(3).

Demographic information presented revealed that 88 percent of the teachers were female with an even mix of age groups. The majority of the teachers (52 percent) stated that they had computers at home and all had experience with computers in 1992 with 97 percent having used one in 1991. Parents responding to the questionnaire were overwhelmingly female (69 percent in 1991 and 73 percent in 1992) and 94 percent were between the ages of 30 and 49. Most of the parents

had computers at home (61 percent in 1991 and 67 percent in 1992) and 94 percent had used a computer.

Summary and Implications:

Davidson and Ritchie concluded that their results tended to confirm the belief that successful implementation of technology requires a supportive environment from all involved in the school community (1994). The authors further found that when the attitudes of students, teachers, and parents toward computers remain positive, computers can be effectively implemented (1994b).

Summary

Findings revealed in the four studies show that the age and gender of the individual being surveyed may or may not have an effect on their attitudes toward computers. Two studies, Gressard and Loyd (cited in Kristiansen, 1991) and Baylor (cited in Kristiansen, 1991) found that age was not a significant variable in determining attitude differences toward computers. However, Baack, et al (cited in Kristiansen, 1991) did find that older adults held less positive attitudes toward computers than did younger adults. Both studies by Davidson and Ritchie (1994a, 1994b) found that both parents and teachers held overwhelmingly positive attitudes toward computers but presented no specific data comparing the ages of the respondents to their attitudes toward computers.

Hattie and Fitzgerald (1987) found that male students, female teachers, and female parents were more likely to agree that computers should be used in the schools and were less scared or uneasy with computers. Kristiansen (1991) did not discuss the gender issue at all, while Davidson and Ritchie (1994b) only mention

the gender of the respondents as part of their demographic information. However, it is possible to assume from the data presented by Davidson and Ritchie (1994b) that females do hold positive attitudes toward computers.

The effect of experience with computers on attitudes toward computers was discussed in all four studies. Hattie and Fitzgerald (1987) found that computer users were generally more positive about the use of computers. Kristiansen (1991) cites four studies (Elkins, Jones & Wall, Lillard, and Honeyman & White) that found the amount of experience with computers did effect the attitudes of teachers toward computers. Davidson and Ritchie (1994b) did not speak directly to the effect of experience with computers on attitudes toward computers. However, as more than 90 percent of the teachers and parents had used computers and both groups held extremely positive attitudes toward computers, it can be assumed that there is a positive correlation between experience and attitude in the Davidson and Ritchie (1994b) study.

As has already been discussed, only four studies could be located that specifically addressed the difference in attitudes between teachers and parents in regard to computers. Despite an exhaustive search of various computerized database systems, only four studies could be located. The descriptors used to search and identify possible studies included: Teacher-Attitudes, Parent-Attitudes, and Computers. Articles selected for the study included all three descriptors and spoke directly to the purpose of the study. As only four studies were located, the design of this study is driven by the intense review of literature that revealed that the relationship between the attitudes of parents and teachers toward computers had not been systematically studied.

CHAPTER III

METHODOLOGY

This study of parents and teachers was developed to assess their attitudes toward computers as revealed on the Adult Attitudes Toward Computers Scale (ATC) (Appendix A). The purpose of this research was to evaluate the relationship of these attitudes to age, gender and experience with computers and to further determine whether there is a relationship between these attitudes and the implementation of computers in the elementary school. The hypotheses, population, instrument, procedures, data collection, and data analysis used in the study are discussed.

Hypotheses

The hypotheses for this study were derived from the review of literature. The literature review revealed that the effects of age, gender, and the amount of experience with computers on attitudes toward computers were inconclusive. The following hypotheses were developed to determine whether there were differences in attitudes toward computers based on age, gender, and the amount of experience with computers of an individual.

1. There are no significant differences by age group among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

2. There are no significant differences by gender among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
3. There are no significant differences by level of experience among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
4. There are no significant differences by age group among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
5. There are no significant differences by gender among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
6. There are no significant differences by level of experience among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
7. There are no significant differences by age group between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
8. There are no significant differences by gender between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.
9. There are no significant differences by level of experience between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

Population

The survey sample consisted of the 39 teaching staff and 516 parents or guardians of the students of Oneida Elementary School in Oneida, Tennessee. This site was chosen because of the professed desire of the school personnel to implement the use of computer technology throughout instruction and school management. Criteria used to identify subjects included: (a) teaching staff must be associated with the instruction of students at the elementary school, and (b) parents or guardians must be the primary care providers of a student or students at the Oneida Elementary School.

Instrument

The instrument chosen for this study was the Adult Attitudes Toward Computers Scale (ATC) (Lewis & Delcourt, 1987) (Appendix A). This instrument contains 15 items that describe three conceptual categories (General Interest, Comfort, and Usefulness).

Design

The 15-item scale developed by Lewis and Delcourt (Appendix A) addresses three subscales. Factor I (General Interest) identified enthusiasm about working with computers. Factor II (Usefulness) reflected perceived usefulness of the computer in achieving daily living skills. Factor III (Comfort) indicated self-confidence (as opposed to apprehension or fear) about ability to work with computers. Questions 4, 6, 11, 13, and 14 were related to the General Interest factor. Questions 1, 3, 5, 8, and 12 were related to the Usefulness factor and,

questions 2, 7, 9, 10, and 15 were related to the Comfort factor. The ATC Scale requires respondents to reply to ideas based on a 5-point Likert response format, utilizing descriptors ranging from "strongly disagree" (1) to "strongly agree" (5). The ATC total score and subscore means and standard deviations were calculated for the three factors. A mean score of 4.0 or above indicated a response of "agree" or "strongly agree" which indicated a positive attitude. A mean score below 4.0 indicated responses of "not sure," "disagree," or "strongly disagree" which indicated a less than positive attitude.

Reliability and Validity

All items on the instrument were previously examined for reliability and validity. An internal reliability consistency estimate of .87 for the entire survey was established by Lewis and Delcourt. Reliability estimates for each factor were established at .90 for factor I, .82 for factor II, and .89 for factor III. Lewis and Delcourt employed a Principal Component Factor Analysis using Kaiser's criterion to establish construct validity. Content validity for readability, applicability to varying educational levels, and socio-economic status of adults were established by use of pilot studies with adults.

Procedures

Research procedures were implemented in four stages that included, preparation, data collection, data analysis, and the drawing of conclusions. The preparation stage was initiated in the Fall of 1994. Data collection, data analysis, and the drawing of conclusions were implemented and completed in the Summer of 1995..

Preparation

An attempt was made to contact Drs. Lewis and Delcourt in an effort to receive written permission to use the questionnaire they had developed. This attempt to receive the permission of the authors failed as both professors had since left the positions held at the time the instrument was developed. Although written permission was not obtained, the investigator chose to proceed with the instrument and cite the authors as developers. Permission to administer the questionnaire was obtained from the Principal at Oneida Elementary School and all necessary support was pledged. The Demographic Information Sheet (Appendix B) was prepared. During the Spring and early Summer of 1995, a dissertation proposal was prepared, presented, and approved by the investigator's doctoral committee.

Data Collection

The questionnaire was distributed to the 39 teaching staff at the elementary school and to the 516 students to take home to their parents during the last week of May, 1995. The teaching staff and parents had one week to complete and return the surveys. The teaching staff returned all surveys to the school librarian. Parents also returned the surveys to the librarian via their children. Parents who had more than one child attending the school were asked to complete one survey for each child.

A cover letter was sent with each questionnaire explaining the purpose of the study and how the information gained would be used. Complete anonymity was assured, and an outline of the findings was offered. Respondents were asked to read each statement and indicate the extent to which they agreed or disagreed with the ideas presented. The questionnaire required approximately 20 minutes to

complete. The data collected were coded and entered into the Microsoft Excel spreadsheet program. Any questionnaire returned with the omission of age, gender, or amount of computer experience was not included in the study. Of the 39 surveys distributed to the teaching staff, 10 were not included in the study as the required demographic information had not been provided. All of the 200 surveys returned by the parents or guardians of the elementary school students were included in the study. The 229 surveys returned represent a response rate of 41 percent.

Data Analysis

Descriptive statistics were used in treating all data collected. Means and medians were utilized as measures of central tendency and standard deviations were used to identify variations. In order to determine whether certain demographic variables could explain any variations in responses to the Total ATC score and subscores, one-way analysis of variance was employed. The test for Honestly Significant Differences (HSD) was employed as follow-up analysis. An alpha level of .05 was established.

After all data from the questionnaires were coded, the information was entered on separate spreadsheets for teachers and parents and imported into the JMP statistical software package. Also, ANOVAs were computed for each group to determine differences in attitudes based on age, gender, and the amount of experience with computers. If the results indicated no significant differences based on age, gender, and amount of experience with computers on the Total ATC, no further statistical analyses were computed. As all teachers responding were female, no descriptive statistical analyses based on gender were conducted for teachers.

After determining whether the attitudes of respondents were positive or negative based upon the three subscales (General Interest, Usefulness, and Comfort) which make up the ATC, the findings were compared with those presented in other studies which were discussed in the review of literature. These studies found that the attitudes of those involved in the introduction of technology effect the success or failure of that introduction.

Summary

This study involved 229 parents and teachers associated with the Oneida Elementary School in Oneida, Tennessee. The questionnaires were distributed to the teaching staff at the elementary school and to students to take home to their parents during the last week of May, 1995. Any questionnaire returned with the omission of age, gender, or amount of computer experience was not included in the study. Data analyses were completed at The University of Tennessee through the JMP statistical software package.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

This study of 229 parents and teachers was designed to evaluate three hypotheses. It was hypothesized that attitudes would not vary by age, gender, and the amount of experience with computers of the respondent. The attitudes were measured with the Adult Attitudes Toward Computers Scale (ATC) developed by Lewis and Delcourt (1987) at the University of Connecticut.

Description of Sample

Five hundred and fifty-five subjects (parents and teachers) were identified from the school population that met the research criteria. Each subject had to be associated with the educational activities at Oneida Elementary School. This number included all teachers and instructional staff. Of this number, 229 instructional staff returned their surveys completed. The group of parents ranged in age from 22 to 56 years and included 162 (81%) females and 38 (19%) males with the amount of computer experience ranging from none to 20 years (Table 1).

TABLE 1

Characteristics of the Sample (N=229)

Variable	Frequency	Percent	Statistics
Teachers:			
Age (Years)			
Group			
1 20-24	2	6.9	Mode = 30-34
2 25-29	2	6.9	
3 30-34	7	24.1	
4 35-39	3	10.4	
5 40-44	5	17.0	
6 45-49	4	13.8	Mean = 40
7 50-54	4	13.8	
8 55-	2	6.9	
Total	29	100.0	
Gender:			
Female	29	100.0	
Male	0	0.0	
Total	29	100.0	
Experience with Computers (years):			
0	5	17.2	Mean Level = 3.62
1 to 2	4	13.8	
3 to 5	14	48.3	
6 to 10	5	17.2	
11 or more	1	3.5	
Total	29	100.0	SD = 0.52
(Table continues)			

Table 1 (continued)

Characteristics of the Sample (N=229)

Variable	Frequency	Percent	Statistics
Parents:			
Age (Years)			
Group			
1 20-24	8	4.0	Mode = 30-34
2 25-29	38	19.0	
3 30-34	58	29.0	
4 35-39	47	23.5	
5 40-44	34	17.0	
6 45-49	10	5.0	Mean = 34.86
7 50-54	3	1.5	
8 55-	2	1.0	
Total	200	100.0	
Gender:			
Female	162	81.0	
Male	38	19.0	
Total	200	100.0	
Experience with Computers (years):			
0	84	42.0	Mean Level = 2.95
1 to 2	49	24.5	
3 to 5	29	14.5	
6 to 10	22	11.0	
11 or more	16	8.0	
Total	200	100.0	SD = 0.31

The group of teachers ranged in age from 22 to 60 years and included all females with the amount of computer experience ranging from none to 11 years (Table 2).

TABLE 2

Mean Scores and Standard Deviation Total ATC by Age of Teacher

<u>Age</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (20-24)	2	3.9	1.0
2 (25-29)	2	4	1.0
3 (30-34)	7	3.9	1.1
4 (35-39)	3	4.2	1.4
5 (40-44)	5	3.9	0.8
6 (45-49)	4	4	1.2
7 (50-54)	4	3.9	0.9
8 (55-59)	<u>2</u>	<u>3.8</u>	<u>0.6</u>
Total	29	4.0	1.0

Age of Parents

The eight age groups are clustered on 5-year intervals. The data displayed in Table 1 reveal that 4% (n=8) of the parents were ages 20-24; 19% (n=38) were 25-29; 29% (n=58) were 30-34; 23.5% (n=47) were ages 35-39; 17% (n=34) were ages 40-44; 5% (n=10) were 45-49; 1.5% (n=3) were ages 50-54, and 1% (n=2) were ages 55 or older. The mean age of the parents was 34.86 years old (SD .48) (Table 1).

Age of Teachers

The data displayed in Table 1 reveal that 6.9% (n=2) of the teachers were ages 20-24; 6.9% (n=2) were ages 25-29; 24.1% (n=7) were ages 30-34; 10.4%

(n=3) were ages 35-39; 17% (n=5) were ages 40-44; 13.8% (n=4) were ages 45-49; 13.8% (n=4) were ages 50-54, and 6.9% (n=2) were ages 55 or older. The mean age of the teachers was 40 years (SD 1.93) (Table 1).

Amount of Computer Experience of Parents

The majority (42%; n=84) of parents had less than one year of computer experience. Of the respondents who did have experience with computers, 24.5% (n=49) had less than three years, 14.5% (n=29) had less than six years, 11% (n=22) had less than eleven years, and 8% (n=16) had eleven years or more. The mean years of experience with computers was 2.95 (SD .31) (Table 1).

Amount of Computer Experience of Teachers

Most of the teachers (82.8%; n=24) responding to this survey had at least one year of experience with computers. Of those with computer experience, 13.8% (n=4) had less than three years, 48.3% (n=14) had less than six years, 17.2% (n=5) had less than eleven years, and 3.5% (n=1) had eleven or more years of experience with computers. The mean years of experience with computers was 3.62 (SD .52) (Table 1).

Summary

The sample of parents (n=200) ranged in age from 22 to 56 years of age with the mean age being 34.86 years (SD .48). The amount of experience with computers ranged from 0 to 20 years with 2.95 (SD .31) years as the mean. The majority of the sample were female (81%). The sample of teachers (n=29) ranged in age from 22 to 60 with a mean age of 40 years old (SD 1.93) and between 0 and

11 years of experience with computers. All of the teachers responding to the questionnaire were female.

Hypothesis Testing

The first part of the hypothesis testing concerned only the teachers. Therefore, hypotheses one through three were tested and are presented below. Following the testing of hypotheses related only to teachers are those of the parents followed by the testing of hypotheses seven through nine. A summary of each section is presented.

Hypothesis 1: Attitude and Age of Teachers

There are no significant differences by age group among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by age of teacher was 4 (SD 1) (Table 2) which indicated a positive attitude toward computers overall. The sample was grouped into eight age categories. The mean scores and standard deviations for each group are indicated in Table 2.

The most positive Total ATC score (4.2, SD 1.4) was found in age group 4 (35-39). Age group 8 (55-59) had the least positive score (3.8, SD .6). Positive Total mean scores were exhibited by age groups 2 (25-29) (4, SD 1) and 6 (45-49) (4, SD 1.2). Less than positive Total mean scores were revealed by age group 1 (20-24) (3.9, SD 1); group 3 (30-34) (3.9, SD 1.1); group 5 (40-44) (3.9, SD .8) and group 7 (50-54) (3.9, SD .9).

In order to determine whether the differences in the total mean scores between age groups were significant, an analysis of variance test was performed. The

analysis of variance test produced an F ratio of 0.172 with an F probability of .988 (Table 3). There were no significant differences in mean scores among the age groups of teachers. Therefore the null hypothesis was supported and no further analysis was conducted.

TABLE 3

Analysis of Variance Total ATC Scores by Age of Teacher

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	7	.096	0.014	0.172	0.988
Within Groups	<u>21</u>	<u>1.671</u>	0.080		
Total	28	1.767			

Hypothesis 2: Attitude and Gender of Teachers

Since all respondents were female, there were no significant differences by gender among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by gender of teacher was not computed nor was any statistical analysis conducted.

Hypothesis 3: Attitude and Experience with Computers of Teachers

There are no significant differences by amount of experience with computers among teachers in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by amount of experience with computers of teachers was 4.0 (SD 0.9) (Table 4), indicating a slightly less than positive attitude toward computers based on the amount of experience teachers had with computers. The sample was grouped into five experience levels. The mean scores and standard deviations for each level are presented in Table 4.

TABLE 4

Mean Scores and Standard Deviation Total ATC by Amount of Experience with Computers of Teachers

<u>Years of Experience</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (0)	5	3.8	0.9
2 (1-2)	4	4.0	0.7
3 (3-5)	14	4.0	1.2
4 (6-10)	5	3.9	1.0
5 (11-)	<u>1</u>	<u>4.3</u>	<u>0.8</u>
Total	29	4.0	0.9

The most positive Total ATC score (4.3, SD 0.8) was found in experience level 5 (11+). Experience level 1 (0) had the least positive score (3.8, SD 0.9). Only experience level 3 (3-5 years) exhibited a positive Total mean score (4.0 SD

1.2). Less than positive Total mean scores were revealed by experience level 2 (1-2 years) (4.0, SD 0.7) and level 4 (6-10 years) (3.9, SD 1.0).

In order to determine whether the differences in the total mean scores between experience levels were significant an analysis of variance test was performed. The analysis of variance test produced an F ratio of 0.1404 with an F probability of 0.263 (Table 5).

TABLE 5

Analysis of Variance Total ATC Scores by Amount of Experience with Computers of Teachers

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	4	0.335	0.084	1.404	0.263
Within Groups	<u>24</u>	<u>1.431</u>	0.060		
Total	28	1.767			

There were no significant differences in mean scores among the experience levels of teachers. Therefore the null hypothesis was supported, and no further analysis was conducted.

Summary of Section One

Statistical analysis of the data related to hypotheses one through three revealed that there were no significant differences among teachers, in relation to their attitudes toward computers, based on (1) age, (2) sex, or (3) amount of experience with computers (Tables 3 and 5). However, no statistical analysis was conducted

to test hypothesis two as all respondents were female. Further, all statistical analyses revealed that teachers responded on the low-end of positive on the attitude scale (Tables 2 and 4). As all ANOVA testing resulted in there being no significant differences, no further statistical testing was conducted.

Hypothesis 4: Attitude and Age of Parents

There are no significant differences by age group among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by age of parent was 4.1 (SD 0.94) (Table 6) which indicated a positive attitude toward computers overall by parents. The sample was grouped into eight age categories. The mean scores and standard deviations for each group are indicated in Table 6.

TABLE 6

Mean Scores and Standard Deviation Total ATC by Age of Parent

Age	N	Mean	Standard Deviation
1 (20-24)	8	4.0	0.9
2 (25-29)	38	4.0	0.9
3 (30-34)	58	4.1	1.0
4 (35-39)	47	4.1	1.1
5 (40-44)	34	4.0	1.1
6 (45-49)	10	4.0	1.1
7 (50-54)	3	4.3	0.7
8 (55-59)	<u>2</u>	<u>3.9</u>	<u>0.7</u>
Total	200	4.1	0.94

The most positive Total ATC score (4.2, SD 1.4) was found in age group 7 (50-54). Age group 8 (55-59) had the least positive score (3.9, SD 0.7). Positive Total mean scores were exhibited by age groups 1 (20-24) (4.0, SD 0.9), 2 (25-29) (4.0, SD 0.9), 3 (30-34) (4.1, SD 1.0), 4 (35-39) (4.1, SD 1.1), 5 (40-44) (4.0, SD 1.1), and 6 (45-49) (4, SD 1.2).

In order to determine whether the differences in the total mean scores between age groups were significant an analysis of variance test was performed. The analysis of variance test produced an F ratio of 0.454 with an F probability of 0.867 (Table 7). There were no significant differences in mean scores among the age groups of parents. Therefore the null hypothesis was supported and no further analysis was conducted.

TABLE 7

Analysis of Variance Total ATC Scores by Age of Parent

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	7	0.466	0.067	0.454	0.867
Within Groups	<u>192</u>	<u>28.150</u>	0.147		
Total	199	28.616			

Hypothesis 5: Attitude and Gender of Parents

There are no significant differences by gender among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by gender of parent was

4.15 (SD 1.0) (Table 8) which indicated a positive attitude toward computers overall by gender of parent. The mean scores and standard deviations for each sex are presented in Table 8

TABLE 8

Mean Scores and Standard Deviation Total ATC by Gender of Parent

Gender	N	Mean	Standard Deviation
Male	38	4.1	1.0
Female	<u>162</u>	<u>4.0</u>	<u>1.0</u>
Total	200	4.05	1.0

Positive Total mean scores were exhibited by both males (4.1, SD 1.0) and females (4.0, SD 1.0).

In order to determine whether the differences in the total mean scores between males and females were significant an analysis of variance test was performed. The analysis of variance test produced an F ratio of 1.357 with an F probability of 0.245 (Table 9). There were no significant differences in mean scores among the gender groups of parents. Therefore the null hypothesis was supported, and no further analysis was conducted.

TABLE 9

Analysis of Variance Total ATC Scores by Gender of Parent

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	1	0.195	0.195	1.357	0.245
Within Groups	<u>198</u>	<u>28.421</u>	1.144		
Total	199	28.616			

Hypothesis 6: Attitude and Experience with Computers of Parents

There are no significant differences by amount of experience with computers among parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by amount of experience with computers of parents was 4.1 (SD 1.0) (Table 10), indicates a positive attitude toward computers based on the amount of experience with computers of parents. The sample was grouped into five experience levels. The mean scores and standard deviations for each level are presented in Table 10.

TABLE 10

Mean Scores and Standard Deviation Total ATC by Amount of Experience with
Computers of Parents

<u>Years of Experience</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (0)	84	4.1	1.0
2 (1-2)	49	4.0	1.1
3 (3-5)	29	4.2	0.8
4 (6-10)	22	4.0	1.0
5 (11-)	<u>16</u>	<u>4.0</u>	<u>1.1</u>
Total	200	4.1	1.0

The most positive Total ATC score (4.2, SD 0.8) was found in experience level 3 (3-5). Experience levels 2 (1-2) (4.0, SD 1.1), 4 (6-10) (4.0, SD 1.0), and 5 (11+) (4.0, SD 1.1) all had the least positive Total ATC scores (Table 10). Experience level 1 (0) (4.1, SD 1.0) also had a positive Total ATC score. No experience levels exhibited a less than positive Total ATC score.

In order to determine whether the differences in the total mean scores between experience levels were significant an analysis of variance test was performed. The analysis of variance test produced an F ratio of 1.221 with an F probability of 0.303 (Table 11). There were no significant differences in mean scores among the experience levels of parents. Therefore, the null hypothesis was supported, and no further analysis was conducted.

TABLE 11

Analysis of Variance Total ATC Scores by Amount of Experience with Computers of Parents

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	4	0.700	0.175	1.221	0.303
Within Groups	<u>195</u>	<u>27.916</u>	0.143		
Total	199	28.616			

Summary of Section Two

Statistical analysis of the data related to hypotheses four through six revealed that there were no significant differences among parents, in relation to their attitudes toward computers, based on (1) age, (2) sex, or (3) amount of experience with computers. (Tables 7, 9, and 11). Further, all statistical analysis revealed that parents responded on the low-end of positive on the attitude scale (Tables 6, 8, and 10). As all ANOVA testing resulted in there being no significant differences, no further statistical testing was conducted.

Hypothesis 7: Attitude and Age between Teachers and Parents

There are no significant differences by age group between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. The Total ATC mean score by age of teacher was 4 (SD 1) (Table 12) which indicated a positive attitude toward computers overall by teachers. The sample was grouped into eight age categories. The mean scores and standard deviations for each group is indicated in Table 12.

TABLE 12

Mean Scores and Standard Deviation Total ATC by Age of Teacher

<u>Age</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (20-24)	2	3.9	1.0
2 (25-29)	2	4	1.0
3 (30-34)	7	3.9	1.1
4 (35-39)	3	4.2	1.4
5 (40-44)	5	3.9	0.8
6 (45-49)	4	4	1.2
7 (50-54)	4	3.9	0.9
8 (55-59)	<u>2</u>	<u>3.8</u>	<u>0.6</u>
Total	29	4.0	1.0

The Total ATC mean score by age of parent was 4.1 (SD 0.94) (Table 13) which indicated a positive attitude toward computers overall by parents. The sample was grouped into eight age categories. The mean scores and standard deviations for each group is indicated in Table 13.

TABLE 13

Mean Scores and Standard Deviation Total ATC by Age of Parent

<u>Age</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (20-24)	8	4.0	0.9
2 (25-29)	38	4.0	0.9
3 (30-34)	58	4.1	1.0
4 (35-39)	47	4.1	1.1
5 (40-44)	34	4.0	1.1
6 (45-49)	10	4.0	1.1
7 (50-54)	3	4.3	0.7
8 (55-59)	<u>2</u>	<u>3.9</u>	<u>0.7</u>
Total	200	4.1	0.94

The most positive Total ATC score for teachers (4.2, SD 1.4) was found in age group 4 (35-39). Age group 8 (55-59) had the least positive score (3.8, SD .6). Positive Total mean scores were exhibited by age groups 2 (25-29) (4, SD 1) and 6 (45-49) (4, SD 1.2). Less than positive Total mean scores were revealed by age group 1 (20-24) (3.9, SD 1); group 3 (30-34) (3.9, SD 1.1); group 5 (40-44) (3.9, SD .8) and group 7 (50-54) (3.9, SD .9). The most positive Total ATC score for parents (4.2, SD 1.4) was found in age group 7 (50-54). Age group 8 (55-59) had the least positive score (3.9, SD 0.7). Positive Total mean scores were exhibited by age groups 1 (20-24) (4.0, SD 0.9), 2 (25-29) (4.0, SD 0.9), 3 (30-34) (4.1, SD 1.0), 4 (35-39) (4.1, SD 1.1), 5 (40-44) (4.0, SD 1.1), and 6 (45-49) (4, SD 1.2).

In order to determine whether the differences in the total mean scores between age groups among teachers and parents were significant an analysis of variance test

was performed. The analysis of variance test produced an F ratio of 0.393 with an F probability of 0.980 (Table 14). There were no significant differences in mean scores between the age groups of parents and teachers. Therefore, the null hypothesis was supported, and no further analysis was conducted.

TABLE 14

Analysis of Variance Total ATC Scores by Age Group between Parents and Teachers

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	15	0.824	0.055	0.393	0.980
Within Groups	<u>213</u>	<u>29.821</u>	0.140		
Total	228	30.645			

Hypothesis 8: Attitude and Gender between Teachers and Parents

There are no significant differences by gender group between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort. Differences in attitude based on the gender of the teachers could not be tested as all respondents were female. Therefore, no statistical testing could be conducted to determine whether differences in attitude toward computers existed between teachers and parents.

Hypothesis 9: Attitude and Experience with Computers between Teachers and Parents

There are no significant differences by amount of experience with computers between teachers and parents in Total ATC mean scores or on the subscore means of the ATC: (a) General Interest, (b) Usefulness, or (c) Comfort.

The Total ATC mean score by amount of experience with computers of teachers was 4.0 (SD 0.9) (Table 15), indicates a slightly less than positive attitude toward computers based on the amount of experience with computers of teachers. The sample was grouped into five experience levels. The mean scores and standard deviations for each level are presented in Table 15.

TABLE 15

Mean Scores and Standard Deviation Total ATC by Amount of Experience with Computers of Teachers

<u>Years of Experience</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (0)	5	3.8	0.9
2 (1-2)	4	4.0	0.7
3 (3-5)	14	4.0	1.2
4 (6-10)	5	3.9	1.0
5 (11-)	<u>1</u>	<u>4.3</u>	<u>0.8</u>
Total	29	4.0	0.9

The most positive Total ATC score (4.3, SD 0.8) was found in experience level 5 (11+). Experience level 1 (0) had the least positive score (3.8, SD 0.9). Only experience level 3 (3-5 years) exhibited a positive Total mean score (4.0 SD 1.2). Less than positive Total mean scores were revealed by experience level 2 (1-2 years) (4.0, SD 0.7) and level 4 (6-10 years) (3.9, SD 1.0).

The Total ATC mean score by amount of experience with computers of parents was 4.1 (SD 1.0) (Table 16), and indicates a positive attitude toward computers based on the amount of experience with computers of parents. The sample was grouped into five experience levels. The mean scores and standard deviations for each level are presented in Table 16.

TABLE 16

Mean Scores and Standard Deviation Total ATC by Amount of Experience with Computers of Parents

<u>Years of Experience</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>
1 (0)	84	4.1	1.0
2 (1-2)	49	4.0	1.1
3 (3-5)	29	4.2	0.8
4 (6-10)	22	4.0	1.0
5 (11-)	<u>16</u>	<u>4.0</u>	<u>1.1</u>
Total	200	4.1	1.0

The most positive Total ATC score (4.2, SD 0.8) was found in experience level 3 (3-5). Experience levels 2 (1-2) (4.0, SD 1.1), 4 (6-10) (4.0, SD 1.0), and 5 (11+) (4.0, SD 1.1) all had the least positive Total ATC scores (Table 16). Experience level 1 (0) (4.1, SD 1.0) also had a positive Total ATC score. No experience levels exhibited a less than positive Total ATC score.

In order to determine whether the differences in the total mean scores between experience levels among teachers and parents were significant an analysis of variance test was performed. The analysis of variance test produced an F ratio of 1.076 with an F probability of 0.382 (Table 17). There were no significant differences in mean scores among the age groups of parents. Therefore, the null hypothesis was supported, and no further analysis was conducted.

TABLE 17

Analysis of Variance Total ATC Scores by Experience Levels between Parents and Teachers

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	9	1.297	0.144	1.076	0.382
Within Groups	<u>219</u>	<u>29.348</u>	0.134		
Total	228	30.645			

Summary of Section Three

Statistical analysis of the data related to hypotheses seven through nine revealed that there were no significant differences between teachers and parents, in relation to their attitudes toward computers, based on age or amount of experience with computers. (Tables 14 and 17). However, no statistical analysis was conducted to test hypothesis eight as all teacher respondents were female and a comparison could not be made. As all ANOVA testing resulted in there being no significant differences, no further statistical testing was conducted.

Summary

This study investigated the attitudes of General Interest, Usefulness, and comfort of 29 elementary school teachers and 200 elementary school parents toward computers. Analyses of variances testing ($\alpha = .05$) revealed no significant differences between selected demographic characteristics of the sample and their attitudes on the Adult ATC.

Three demographic variables were studied in relation to Total ATC score. As none of the analysis of variance testing revealed any significant differences, among or between teachers and parents based on gender, age or level of experience with computers, in relation to the Total ATC, none of the subgroups were investigated. All null hypotheses were supported except numbers two and eight. As all teacher respondents were female it was not possible to test for gender differences among teachers nor was it possible to test for gender differences between teachers and parents. All statistical testing revealed that both teachers and parents generally held

positive attitudes toward computers regardless of age, gender, or their level of experience with computers.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Concern over the limited number of systematic studies that have been conducted in the public schools of America to measure the attitudes of parents and teachers toward computers in the classroom and the relationship of those attitudes to the successful introduction of computers in the classroom, led to the design of this study. Attitudes were measured by the total scale on the Adult Attitudes Toward Computers (ATC) and on the subscores identified interest, usefulness, and comfort. The literature suggested that attitudes toward computers were related to the success or failure of the introduction of computers into the classroom. This descriptive study was designed to investigate this notion and provide a foundation from which further investigation may proceed.

Sample

This descriptive research study involved 29 teaching staff and 200 parents of Oneida Elementary School. This site was chosen because of the professed desire of the school personnel to implement the use of computer technology throughout instruction and school management.

Instrument

All respondents completed the Delcourt and Lewis (1987) Adult Attitudes Toward Computers (ATC) questionnaire during the Fall of 1995. This instrument contains 15 items that describe three conceptual categories (General Interest,

Comfort, and Usefulness). The completion of the questionnaire by each respondent required approximately 15 - 20 minutes.

Data Analysis

Descriptive statistics were used in treating all data collected. Means and medians were utilized as measures of central tendency and standard deviations were used to identify variations. In order to determine whether certain demographic variables (age, gender and amount of experience with a computer) could explain any variations in responses to the Total ATC score and subscores, one-way analyses of variance were employed. The test for Honestly Significant Differences (HSD) was employed as a follow-up analysis.

Findings

This study tested nine hypotheses. All nine hypotheses projected that there would be no significant differences found. The following list presents each hypothesis and the results of statistical testing.

Hypothesis 1

Hypothesis number one projected there would be no difference in attitude toward computers based on the age of the teacher. The mean score was 4.0 indicating an overall positive attitude toward computers.

Hypothesis 2

Hypothesis number two projected there would be no difference in attitude toward computers based on the gender of the teacher. This hypothesis was not tested as all respondents were female.

Hypothesis 3

Hypothesis number three projected there would be no difference in attitude toward computers based on the amount of experience with computers of teachers. The mean score was 4.0 indicating an overall positive attitude toward computers.

Hypothesis 4

Hypothesis number four projected there would be no difference in attitude toward computers based on the age of the parent. The mean score was 4.1 indicating an overall positive attitude toward computers.

Hypothesis 5

Hypothesis number five projected there would be no difference in attitude toward computers based on the gender of the parent. The mean score was 4.15 indicating an overall positive attitude toward computers.

Hypothesis 6

Hypothesis number six projected there would be no difference in attitude toward computers based on the amount of experience with computers of parents. The mean score was 4.1 indicating an overall positive attitude toward computers.

Hypothesis 7

Hypothesis number seven projected there would be no difference in attitude toward computers based on the age between teachers and parents. The mean score for teachers was 4.0 and the mean score for parents was 4.1 indicating an overall positive attitude toward computers.

Hypothesis 8

Hypothesis number eight projected there would be no difference in attitude toward computers based on the gender between teachers and parents. This hypothesis was not tested as all teacher respondents were female.

Hypothesis 9

Hypothesis number nine projected there would be no difference in attitude toward computers based on the amount of experience with computers between teachers and parents. The mean score for teachers was 4.0 and the mean score for parents was 4.1 indicating an overall positive attitude toward computers.

Conclusions

The review of literature revealed that the age of respondents may or may not effect their attitudes toward computers. Two studies, Gressard and Loyd (cited in Kristiansen, 1991) and Baylor (cited in Kristiansen, 1991) found that age was not a significant variable in determining attitude differences toward computers. However, Baack, et al (cited in Kristiansen, 1991) did find that older adults held less positive attitudes toward computers than did younger adults. This study did not reveal any evidence that age had any effect on the determination of attitudes toward computers. All age groups between and among teachers and parents held positive attitudes and there were no significant differences between or among age groups.

Even after this study, the research on differences in attitude toward computers based on gender is still inconclusive. Hattie and Fitzgerald (1987) found that female parents and teachers were less likely to be scared or uneasy with computers

than male teachers and parents. Although Davidson and Ritchie (1994b) did not expressly state that females held positive attitudes toward computers, it is possible to assume from the data presented that they do. This study did not reveal any evidence to reject the conclusions of Hattie and Fitzgerald or Davidson and Ritchie. However, this investigator was unable to determine whether there were differences between male and female teachers as all respondents were female. The parent sample was overwhelmingly female, but no significant differences were noted between male and female parents in their attitudes toward computers.

The findings of this study support the research on the effect of experience with computers on attitudes toward computers. All research presented in the review of literature found that the effect of experience with computers on attitudes toward computers was positive. Hattie and Fitzgerald (1987) found that computer users were generally more positive about the use of computers. Kristiansen (1991) cites four studies (Elkins, Jones & Wall, Lillard, and Honeyman & White) that found the amount of experience with computers did effect the attitudes of teachers toward computers. Davidson and Ritchie (1994b) did not speak directly to the effect of experience with computers on attitudes toward computers. However, more than 90 percent of the teachers and parents had used computers and both groups held extremely positive attitudes toward computers. Therefore, it can be assumed that there is a positive correlation between experience and attitude in the Davidson and Ritchie (1994b) study. In this study, all experience level groups between and among teachers and parents held positive attitudes and there were no significant differences between or among age groups.

It is reasonable to assume that the introduction of computers at Oneida Elementary School will be successful. In this study teachers and parents held positive attitudes to computers regardless of their age, gender, or amount of experience with computers. Both groups felt that computers were interesting, useful and felt comfortable with them. Davidson and Ritchie (1994b) found that "computers can be effectively implemented into the classroom when student, teacher, and parent attitudes remain positive and anxieties, low"(p. 3).

Recommendations

The findings of this study suggest the need for further studies of both parents and teachers in specific school sites in an effort to determine whether shared attitudes can be found and related to the success or failure of computer introduction. Further investigation of the demographic factors of age, gender, and amount of experience with computers is warranted. The following questions provide opportunities for future research.

1. Does the age of parents and/or teachers effect their attitudes toward computers in non-rural school sites? This study focused on one elementary school in a rural Appalachian community. It is possible that results could have been different in a community with different characteristics.
2. Does the gender of parents and/or teachers effect their attitudes toward computers in non-rural school sites? It is possible that results could have been different in a community with different characteristics.
3. Would the results of this study have been different if it was conducted before computers ever arrived in the building? This study was conducted after

computers had already been placed in the building. Although few teachers actually used the computers at the time of this study, it is possible that the presence of the machines in the building may have influenced the responses of the teachers and parents. Future studies should be conducted before, during and after the introduction of computers.

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APPENDICES

APPENDIX A
Adult Attitudes Toward Computers
Questionnaire

ADULT ATTITUDES TOWARD COMPUTERS

1. Computers can help me learn.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
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2. Computers make me feel nervous.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
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3. I think that computers will be useful to me in the future.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

4. Computers are interesting.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

5. Computers can be used to help me do many different kinds of things.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

6. I would like to learn more about computers.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

7. The thought of using a computer frightens me.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

8. Knowing ho to use a computer is important in today's world.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

9. I am worried about being able to use a computer.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

10. I am curious about computers.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

11. I am confident that I will be able to work with computers.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

12. Computers can be used to do things more easily.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

13. Learning about computers would be exciting for me.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

14. I would enjoy working with a computer.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
------------------------	------------	------------------	---------	---------------------

15. I am comfortable with the idea of learning to use computers.

I strongly disagree	I disagree	I am not sure	I agree	I strongly agree
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APPENDIX B
Demographic Information Sheet

HOW DO YOU FEEL ABOUT COMPUTERS?

(All answers to this survey will be kept confidential. Thank you for your participation)

What is your age? _____ What is your sex (m/f)? _____

What was the last grade you completed? _____

If you attended college, how many years were completed? _____

Employment Status (Check the one that fits you).

_____ Actively employed, 40 hours or more per week.

_____ Actively employed, less than 40 hours per week.

_____ Not employed.

_____ Retired

Have you used a computer? _____ No _____ Yes

If you have used a computer, where did you use it? (Check all that apply).

_____ Work _____ Home _____ Other

If you have used a computer, how many years have you been using one? _____

Do you own a computer? _____ No _____ Yes

If you do own one, how many hours a week to you use it? _____

Your response is implied consent to participate in a graduate study conducted by Robert Kite.

VITA

Robert Kite was born in Pomona, California on May 24, 1965. He attended public schools throughout Southern California and Denver, Colorado. He graduated from Rubidoux High School in Riverside, California of June 16, 1983. He entered Eastern New Mexico University, Portales, New Mexico during August of 1983 where in May, 1989 he received the Bachelor of Arts degree in Business Administration. In August of 1989 he returned to Eastern New Mexico University to pursue a Master of Education degree in Secondary Education and received that degree in August of 1991. In January of 1992 he entered the doctoral program at The University of Tennessee, Knoxville. The Doctor of Philosophy with a major in Education degree was received December, 1995.

He is presently working as a social studies teacher at Vine Middle School in Knoxville, Tennessee.