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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

EDUCATORS' ATTITUDES TOWARD THE INTEGRATION OF ELECTRONIC GRADING SOFTWARE INTO THE CLASSROOM

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

In partial fulfillment of the requirements for the

Degree of

Doctor of Philosophy

By

NICHOLAS JOSEPH MIGLIORINO
Norman, Oklahoma
2002

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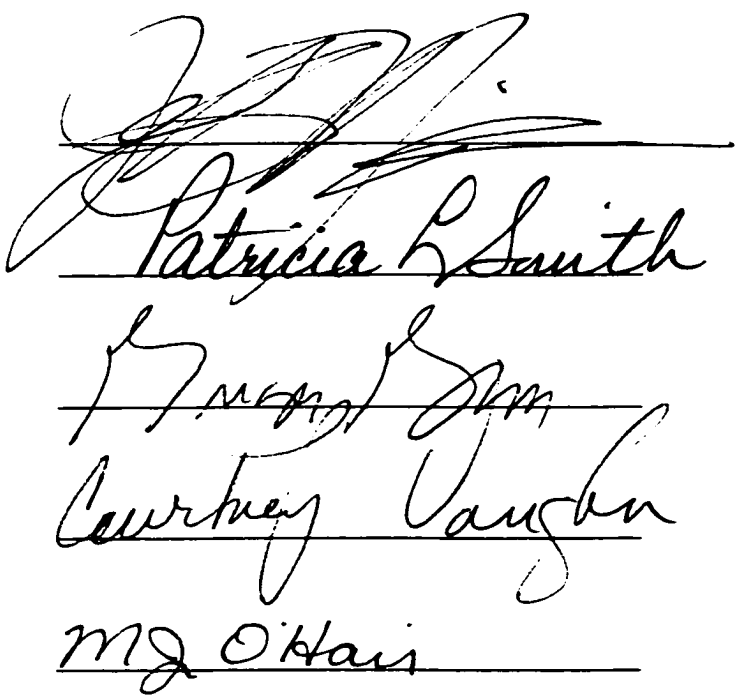
A Dissertation APPROVED FOR THE
DEPARTMENT OF EDUCATION LEADERSHIP AND POLICY STUDIES

BY



ACKNOWLEDGEMENTS

I would like to take this opportunity to express my deep appreciation to a few of my friends, colleagues and family for their help and constant encouragement in my pursuit of this doctoral degree. To begin I want to thank the following people for taking time out of their personal schedule to give me advice, assistance and at times just an ear. They are: Bryan Duke, Rachel Cerney, Steve Huff, Mike Nelson and Rachelle Carpenter. Thank You!

Next I want to express my deep level of gratitude to all of my professional colleagues and associates who allowed me the opportunity to visit their schools and speak with their staffs. Without their cooperation the completion of this study would never have been possible.

Now I would like to show my gratitude to the chair of my doctoral committee, Dr. Jeffrey Maiden. His constant encouragement from beginning to end was truly the backbone of my doctoral pursuit. To the remainder of my committee, thank you to each and every one of you for your individual help and encouragement. Dr. Vaughn, hope you enjoyed my attempt at adding a qualitative piece, it was just for you.

Finally, to my mom and dad Charles and Alice Migliorino, thanks for everything. You have always been there to support me when I needed you. To my sister, Elizabeth, thanks for being my sister and a small hint (never settle for anything but the best, you deserve it). Barbara and Jim Timms it has been a blessing to have both of you in my life. To my son Lathen Joseph Migliorino you are the most awesome part of my life and it was because of you being my priority that such a high priority was placed on completing

this doctoral degree. I want to be able to spend as much time with you as I possibly can. Lastly, to my Renee, you make my life truly complete. I can't imagine going through this process or anything else without you. God has truly blessed me. I LOVE YOU!

"Destiny is not a matter of chance, it is a matter of choice."

Unknown

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ABSTRACT

The purpose of this study was to determine if the attitude of educators towards the integration of electronic grading programs into their schools was significantly related to certain variables, including age, years of teaching experience, gender, relative years of computer experience, and the influence of administrators' attitudes on teachers' attitudes. The results might supply school districts with information to consider before, during, and while actively integrating electronic grading software into their district.

The process of researching the relevant literature for this study was conducted by reviewing numerous sources of information. The sources reviewed include an analysis of Educational Resources Information Center (ERIC), books, articles, journals, websites, and dissertations. Literature directly addressing educators' attitudes towards the integration of electronic grading software into schools was found to be scant and virtually non-existent. Therefore, the literature obtained addresses with attitudes towards technology and/or computers. Based on the literature reviewed, it is apparent that years of computer experience, and years of teaching experience do have an impact on attitudes. It was also discovered in the literature that administrators' attitudes do impact teachers' attitudes.

This study focused on the secondary educator population of two school districts located in the southwestern region of the United States. The study developed and tested five research questions and hypotheses using the EATEGS survey. Of the educators surveyed a total of 720 completed surveys were returned. Using the quantitative methods of correlation analysis and multiple regression analysis the data were analyzed by individual districts and as an entire sample.

The results obtained in this study appear to remain consistent with the trends set forth in the literature review. Years of computer experience and years of teaching experience were found to be statistically significant predictors of educators' attitudes. Interestingly, years of teaching experience and age (even though not statistically significant) both displayed a negative regression coefficient. The correlation analysis to determine if there was any significant relationship between teacher and administrator attitudes revealed that district 1 had no statistically significant correlation where district 2 and the entire sample did show a relatively strong correlation. The correlation analysis also reported a low variance accounted for with both variables which may suggest that there are other factors such as, but limited to past experiences, training, computer dependability or computer availability in existence which may affect educator attitudes.

CHAPTER I

INTRODUCTION

It is a cry heard from many places, "No more lost homework papers. All of our students' work will be on computers!" This is only one of many ideas that some school districts have regarding the role of computer technology in their schools. As a result of enormous advances in communication and computer technology, there is increased opportunity for the application of this technology in today's classrooms. Therefore, the foundation of modern education has been fundamentally altered by computer technology designed for educational purposes. It is this technological change in modern education that some districts are employing to enhance the quality of teaching and learning in their schools.

Studies have shown that the computer is an effective learning and teaching tool (Liaw, 2000; McFarlane, 1997). Accordingly, school district policy makers have attempted to integrate technology into their schools in various ways. Some schools have placed a priority on buying teachers laptops, while others have integrated the uses of individual laptops into their students' daily work. Another option districts are choosing that requires physical changes to classrooms, as well as philosophical changes to teaching methods, are the placement of large, expensive computer labs. These changes to schools are certainly proactive. However, many districts are still seeing no rewards for these efforts.

It is logical to assume that because technology is in place, it will have an immediate effect on the way a student learns. It could also be possible that the truly effective utilization of technology in our schools is being blocked by human factors.

According to a survey by the Dell Computer Corporation, 55 % of the population harbors fear of some form of technology (Hogan, 1994). A survey by Donoho (1994) found that 36% of people who use computers at their offices feel that their skill levels are inadequate. There are other opinions besides human fear and error. One might ponder the question of whether the software being purchased is adequate, or whether it fits the needs of the school. Likewise, one could think that educators are not trained or fitted to the needs of the software. According to George, Sleeth, and Randall (1996), Harris (1985) coined the term "cyberphobia," an aversion or anxiety caused by technology. Other terms commonly used when describing people who resist technology in different ways are "Computerphobia" and "Technophobia" (Henry & Stone, 1997). We have to come to the realization that educators may harbor some form of fear or anxiety to use technology in their classrooms when they are the focus of students' attention (George & Sleeth, 1996). Quite possibly, this anxiety coupled with a lack of training or a poor attitude could hamper the effective use of technology for educational purposes.

Based on attitude research it is apparent that a positive attitude is needed for success. Research conducted in the fields that include, but are not limited to higher education, student learning, academics, and computers and multimedia, have shown that individuals with positive attitudes either achieve their goals more often or are more successful in the areas they are pursuing (Brush, Armstrong, Barbrow & Ulintz, 1999; Cote & Levine, 2000; Gettys & Fowler, 1996; Hayes & Robinson, 2000; McKinnon, Nolan & Sinclair, 2000; Ruggiero, 1998).

Joel Spring (2001) outlines the primary purpose of public schools as being based on political, social, and economic purposes, along with human capital and the role of

business. For this study, the primary goal of schools is seen as the ability to prepare students to lead positive and productive lives. With the numerous advances in technology, computers have now become an integral part of everyday life in the majority of professions. Therefore, they have become a necessary part in leading a "productive" life in the future. Computers cannot improve organizational performance unless they are used appropriately (Davis, Bagozzi & Warsaw, 1989). The success of computer utilization is largely dependent upon the attitude of the faculty and students' attitudes toward computers (Liaw, 2000; Loyd & Gressard, 1984). In 1982, Reece and Gable came to the conclusion that "One could argue that placing microcomputers in schools is a waste of time and money if proper curricular and laboratory experiences do not support the development of positive attitudes towards using the machines to facilitate learning" (p.13).

While some students typically dread the thought and arrival of report cards, it is a safe assumption that teachers dread report cards just as much, but the educational system in the United States makes it a teacher's responsibility to grade students. Few teachers enter the field of education with an actual knowledge of how much time and effort is required in the grading process (Reed, 1996). With report cards being issued every eight to nine weeks (quarter) or 16 to 18 weeks (semester) in many schools, this is a compounding workload. However, before the computer, report cards entailed much more than inputting data into the computer. It was an extremely time-consuming task, requiring the tabulations of an entire term to be done by hand, sometimes with the assistance of a calculator. Another difficulty that consumed educators' time was the combination of using a weighted formula to tabulate a student's grade. For example,

while a homework grade may count as 50% of the total, quizzes may count as 10% of the total, and tests may count as 20% of the total. Even after compiling these categories, let us not forget the addition of special exams, such as semester exams, which at times may count individually as 20% of the student's total grade. Then there are those projects, presentations, and participation grades to figure. The list increases, as does the amount of time teachers have to spend simply calculating grades. This is time spent that teachers would most likely prefer spending on their class lessons or creating and researching more exciting ways for their students to learn (Hall, Butler, Kestner, & Limbach, 1999).

Computers can provide a wonderful opportunity for school districts to create a positive impact on teachers when it comes to calculating grades. The availability of computers and the enormous amount of educational software may provide relief to those who find themselves entrenched by their gradebooks and calculators (Friedman, Valde & Obermeyer, 1998; Harris, 1999). This relief comes in the form of electronic grading software (EGS) packages, which are capable of performing many different functions. With miraculous speed, they tabulate %ages based on weights entered by the educator. They also assign alpha grades (A, B, C, D and F), which are determined at the time the software is set-up. These programs also provide progress reports, grade cards, student information sheets, class averages, statistical measurements of classes, and they even have the ability to take attendance and post information on the internet (Roblyer, Edwards, & Havrileck, 1999). Shelly, Cashman, and Gunter (1999) stated that,

> Gradebook software is a program that allows teachers to track and organize student tests, homework, and other sources. Most gradebook software allows the educator to track thousands of students and hundreds of assignments within the

same gradebook and sort students by name, student number or current average. (p.326)

With proper training for educators and full utilization of this software, all of these tasks can be accomplished by pushing a few buttons on the computer. Once it is entered, the information stays in the program and does not have to be reentered over and over every quarter, semester, or whenever grade reports are needed. In the September 1998 issue of *Technology and Learning* Perter Li stated,

> Electronic gradebooks help you keep records up to date, and communicate grades to students, parents, and administrators more effectively. Grades can be entered numerically, with letters, or with comments for alternative assessment. Perhaps the greatest advantage of these gradebooks is the flexibility they allow educators in reporting student progress. They possess the ability to print class averages, individual student grades, lists of assignments, and even missing assignments. (p.62)

This multitude of options provides the opportunity for educators to define their gradebooks' boundaries, while at the same time allowing for many different variables to be included in the student's total assessment. Aided by the computer, the ability to offer such a well-rounded grading process increases the opportunities through which students may experience success because of the ability the educator has to communicate information pertaining to the individual student quickly and accurately. This success assists educators with the ability to continuously motivate students based on their success or lack of achievement. As seen, the simplification of the tabulation of grades not only benefits the teacher, but the classroom environment as well.

As stated earlier there are many companies producing electronic grading software. A list of five companies and programs used in schools, two of which are used by the schools in this study, are listed below. This list represents a few of the hundreds of different program software packages available. All of these can be downloaded from the internet as a demonstration (see reference list for internet sites):

1. GradeBook Plus by the Society for Visual Education (SVE);
2. GradeBusters by Jay Klein productions;
3. GradeMachine by Misty City Software;
4. GradeStare by Shelltech Software;
5. InteGrade Pro by National Computer Systems, Inc.

Many companies that produce electronic grading software packages for educators allow educators the ability to download demonstrations as freeware or shareware to prompt future purchase (Shelly, 1999). These companies and many more may be found by conducting a web search and typing in the keywords "electronic grading programs."

Grading programs give educators the ability to spend more time planning instruction and less time having to do the time-consuming accounting work required when figuring grades by hand. They also have the ability to produce consistent and professional-looking documents with ease. This is not only a benefit for the teacher, but also for the school, students, and parents. Because grading program successes are primarily utilized by the classroom teachers, it is important to know their opinions of these programs.

In a previous study conducted by Migliorino (2000), grading programs were discussed and teachers' comments were collected. The study examined the implications

of computerized grading and whether or not parents and teachers thought it was more effective or efficient for teachers. In this study, a survey was issued to 47 certified teachers and 100 parents in a school located in the southwestern region of the United States. Seventy-four percent of the teachers felt as if computerized grading was more efficient and occupied less of their planning and instructional time. Ninety-nine percent of the parents interviewed stated that they would rather receive a standardized computer generated progress report because they felt as if it was more accurate.

A few of the comments collected from teachers are listed; 'Electronic grading has effectively allowed us to move into the electronic era with success'.... 'We like it because we can adapt it to our school. It can accommodate any school situation'.... 'Saves us an enormous amount of time by taking care of our attendance and database record keeping'.... 'Although I am a computer novice, it is even easy for me to use.' (pp.13-17)

Reed (1996) found that there is a large variance of grading practices within and across departments and schools. Within his study it was found that there was a wide variety of ways in which teachers tabulate the grades they report on report cards. Because of issues such as teachers using different methods in computing grades, the use of electronic grading programs in schools should bring some consistency into these practices. Not only does using electronic grading software promote consistency, it also assists in promoting professionalism in documentation process through schools as well. As with everything, some people will accept it and use it effectively, where others will not.

Statement of Problem

The implementation of technology in schools is something all school districts are striving to achieve. Educators are being challenged to integrate technology into their curriculum in many different ways. One way educators are being challenged to integrate technology is through the use of electronic grading programs. The problem of this study is to determine if the attitudes of educators towards the integration of electronic grading software into schools affects a school district's ability to integrate electronic grading software. Existing research on teachers' attitudes towards electronic grading software integration was found to be non-existent. Therefore, having this information will assist districts with the integration of electronic grading software.

Purpose of the Study

The purpose of this study was to determine if the attitude of educators towards the integration of electronic grading programs into their schools was significantly related to certain variables, including age, years of teaching experience, gender, relative years of computer experience, and the influence of administrator attitudes on teachers' attitudes. The results might supply school districts with information to take under consideration before, during, and while actively integrating electronic grading software into their district. Five research questions were developed and tested using null and alternative hypotheses. To obtain the needed data, educators in two separate school districts were asked to complete a questionnaire to assess their attitudes.

Significance for the Study

Studies regarding the integration or implementation of technology into schools are widely available. Among these are studies focusing on attitudes of teachers, principals, counselors and other school employees on integrating technology into schools, either to be used by students or themselves. Literature dealing with attitudes of educators towards the integration of electronic grading technology into schools for the sole use of the educator, however, is virtually non-existent. No study was found that specifically assess the attitude of educators towards the integration of electronic grading software into schools. Although literature was found discussing different types of grading software, it appears that there is a need for an assessment of the attitudes of the educators who will actually be utilizing this software.

Electronic grading software is a tool which can be of tremendous help to educators. They will spend less time on the accounting aspect of educating students and more time on the actual planning and teaching. If the attitude of the educator is not positive, or if educators feel uncomfortable using the software, it could possibly take away from the available planning and instructional time.

Research Questions

The following research questions were written to be examined in this study:

1. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to chronological age?
2. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of teaching experience?

3. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to gender?

4. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of computer experience?

5. Are teachers' attitudes toward the integration of electronic grading software into the classroom significantly related to administrator attitudes?

Null and Alternative Hypotheses

The following null and alternative hypotheses were developed based on the research questions to be examined in this study:

Null hypothesis 1: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software and chronological age.

Alternative hypothesis 1: There is a statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and chronological age.

Null hypothesis 2: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the school and years of teaching experience.

Alternative hypothesis 2: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and years of teaching experience.

Null hypothesis 3: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educator gender.

Alternative hypothesis 3: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and gender.

Null hypothesis 4: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educators' years of computer experience.

Alternative hypothesis 4: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and educators' years of computer experience.

Null hypothesis 5: There is no statistically significant relationship between the attitude of teachers toward the integration of electronic grading software in the classroom and the attitudes of the administrators.

Alternative hypothesis 5: There is a statistically significant relationship between the attitude of teachers toward the integration of electronic grading software into the classroom and the attitudes of the administrators.

Organization of the Study

Chapter one includes an introduction to the study, the significance for the study, statement of the problem, the research questions and hypotheses, the definition of terms, the assumptions of the study, and the limitations of the study. Chapter two consists of a review of the related literature and research. Chapter three describes the methodology

and procedures used in designing and conducting this study. Chapter four presents the results of the study in the context of the research questions and hypotheses. Chapter five reports the conclusions taken from the study and suggests recommendations for future research.

Definitions

Attitude: How educators personally perceive using electronic grading programs in their school.

Educators: For the purposes of this study the term educator(s) refer(s) to both teachers and principals/administrators.

Electronic Grading Software (EGS): Software programs adopted by school districts for the use of calculating student grades.

Assumptions

The following assumptions in regards to this study are:

1) The instrument used to determine the attitudes of educators towards electronic grading software (EATEGS) was validly and reliably employed with public school educators.

2) The educators comprising the study sample responded honestly to the questionnaire.

3) The higher the attitude score on the EATEGS questionnaire represents a more positive attitude.

4) The sample used in this survey is representative of the larger populations of schools in similar school districts in the United States.

Limitations

The study was limited by the following factors:

1) The study was based on only the secondary schools (a total of 15), in two school districts, in one state, located in the southwest United States; therefore, the findings may not be able to be generalized throughout the United States.

2) The study depended on the willingness of the educators to provide accurate information to accurately determine attitudes towards electronic grading programs.

3) The study does not assess how the attitude of the educator may affect the way in which grades are assessed.

Summary

This chapter provided an overview of technology in schools and what schools are doing to integrate it. The chapter discusses the attitudes of educators towards the integration of technology in general and of electronic grading programs.

CHAPTER II

LITERATURE REVIEW

Introduction

The purpose of this chapter is to review the literature relevant to the present study. Literature directly addressing educators' attitudes towards the integration of electronic grading software into schools was found to be scant and virtually non-existent. Nor were there any studies found directly addressing the topic of the integration of electronic grading software into schools generally. Therefore, this chapter will review components of technology, educator attitudes, and assessment. Many different areas, such as computer technology history (early and modern), the importance of technology in schools, and the attitudes of educators towards technology are mentioned in this review of related literature. This review also includes information about how different variables such as age, years of experience, computer competency, and the accessibility of computers affect the attitudes of educators. Sources for this review include an analysis of Educational Resources Information Center (ERIC), books, articles, journals, websites, and dissertations. The process for the search of literature included manual and electronic means to insure that the topics related to this review were fully explored.

History

Every era has its particular theme. If one were asked about the theme of modern life, they would most likely make reference to the technology age, with the most likely representative of the technological age being the computer. Nothing better epitomizes our modern life than the computer. A computer has the ability to store information in a binary digital format, but display it back to the user in a variety of multimedia styles.

Computers have infiltrated every aspect of our society, and they are doing much more than simply computing. For example, supermarket scanners calculate grocery bills and at the same time adjust store inventory. Computerized telephone centers play "traffic cop" to millions of calls and keep lines of communication untangled, while automatic teller machines (ATMs) allow banking transactions from virtually anywhere in the world (LaMorte & Lilly, 2000). Alix (1997) cites a reflection that describes how important the computer is in modern society: She sees that the revolution in computer technology continues to play an ever-increasing role in today's culture, affecting individuals of all ages from the pre-kindergarten child to adults over 60. Computer technology has made its appearance in all areas of business, education, and society. It has progressed from the scientific area where it first made its impact to the present. So widespread has been its influence that in 1982 the editors of *Time* deviated from their normal routine of designating a person as "man of the year," giving the honor instead to the computer as having the greatest impact on the world. Regarding that issue, Friedrich (1983) stated,

> There are some occasions ... when the most significant force in a year's news is not a single individual but a process, and a widespread recognition by a whole society that this process is changing the course of all other processes. That is why, after weighing the ebb and flow of events around the world, TIME has decided that 1982 is the year of the computer. It would have been possible to single out as Man of the Year one of the engineers or entrepreneurs who masterminded this technological revolution, but no one person has clearly dominated those turbulent events. More important, such a selection would

obscure the main point. TIME's Man of the Year for 1982, the greatest influence for good or evil, is not a man at all. It is a machine: the computer,

How did the computer come to be such a mainstay in everyday life? It is intriguing to discover what kind of history computer technology has had.

The search begins 5,000 years in the past, when the abacus first emerged in Asia Minor. It is still in use today, and it may be considered the first computer (LaMorte & Lilly, 2000). In 1950, the microcomputer emerged into the market (Bozdoc, 2000). These computers were very large and very slow compared to current standards. Finally, in 1981, the breakthrough that would continue spiraling outward to this day was introduced. International Business Machines (IBM) introduced its personal computer (PC) for use in the home, office, and schools (Bozdoc, 2000; LaMorte & Lilly, 2000). Since that time, microcomputer technology has excelled to become the most powerful force within the technological system, especially in education (Stivers, 1999).

Since it's beginning, free public education focused on providing a worthwhile education to all students who attend school in the United States. The dedication to this mission has been consistent. Attempts to prepare students for successful lives beyond school continues each school year. Schools in modern society must move forward with their techniques in teaching technology to students. Vendantham and Breeden (1995) state that computer technology holds the promise of meeting a wide range of educational needs, including:

1. Access to individualized self-paced instruction;
2. More equitable access to all types of educational resources;
3. The construction of collaborative learning environments;

4. Improved access for disabled individuals;
5. Continuous professional development for teachers;
6. Greater administrative and educator efficiency. p.32

Much of the change in education has been in response to pressures from the outside. Developments occur so rapidly that schools seem to be in a continuous transient phase. Many of today's school classrooms do not even resemble classrooms of a couple of decades ago (McFarlene, 1997). As soon as education reaches the point where it feels it is with the times, it finds itself again far behind. In fact, according to *THE Journal* (1997), technological tools become obsolete at such a rapid rate that even now, thirty years after the computer's emergence, one has the feeling of being still at the beginning because most computers in American schools are old and obsolete (Vedantham & Breeden, 1995). With the monetary struggle schools are facing, technologically they cannot keep up the pace. Schools are attempting to work with technology equipment that is very out-dated.

With many aspects of American society and even the overall world economy becoming increasingly affected by the presence of the computer in society, (Maher, 1994) education has quickly fallen behind, partly because of the historic lack of funding for education as a whole. Technology in the 21st century has surpassed the expectations of many. While businesses are striving to keep the pace, schools struggle to keep up by depending on the United States Department of Education (USDE) for funding. The USDE is the main government agency responsible for the incorporation and funding of technology in education (Vedantham & Breeden, 1995). However, we now find ourselves surfing a school website, visiting teachers' web pages, or checking the school

lunch calendar online. Likewise, teachers have had numerous changes in their daily classroom routines, including the way they take attendance and their process for introducing new material to their students. Technology even affects schools processes for computing and reporting grades. All of these changes require money and training for the technology to be effective. However, because of a lack of funding, schools find themselves implementing these changes with almost an ironic self-teach philosophy at times, which result in a game of catch-up. Because of these real world uses, computer technology is moving forward, while education too often looks studiously backward (Morton, 1996). This is evident based on the typically out-of-date computers found in schools.

The computers currently available to people and schools in today's world are very powerful machines, having made tremendous strides since the 1980s. Computers have become an everyday part of life; they are part of electronic systems used everyday in products such as microwaves, VCRs, cameras, and games (Rosen, Sears &, Weil, 1993). They are also in a variety of new instructional technologies such as the television, videodisks, multimedia computing, satellites, cables, distance learning, and especially the microcomputer (Van Horn, 1996). The computers available consist of 1.5 gigabyte processors, 40-to-50 gigabyte hard drives, hundreds of megs of RAM, processor speeds doubling approximately every 18 months (Lewis, 1999), and so much education software that it would be impossible for any one person or district to know about it all (Harris, 1999). With this in mind, it has been difficult for schools to keep current. In schools, microcomputers have faced an uphill battle because the technology outpaced educators' abilities to use them (Foster, 1998). With the rapid advancement of technology and

schools being on a limited budget, it is hard to know if what is being purchased now will be useful in the next year or two. This is especially crucial in schools with both computer hardware and computer software.

Educational software is produced at enormous rates. The educational software that is produced consists of textbook tutorials, maps, accounting programs, typing software, web page programs, and chalkboard assistants. Because of this flood of software, districts have to be extremely selective in their purchases. Money is required for the purchases as well as to train the purchasers for effective use in the schools.

Since the inception of the abacus, education has adjusted to meet the technological advances in society. It was apparent then and it is today that schools must integrate technology into teaching and learning processes. Likewise, it has always been apparent that every student deserves the best possible education, regardless of limitations. If a doctor is required to give emergency medical care to a patient, but they have not been fully trained, they don't refuse care to the patient. The doctor sees to it that adjustments are made to insure the well being of the patient. This also applies to educators who are not always fully trained in the technology needed to teach their students, but who must find ways to adapt for the well being of the students. Therefore, regardless of the financial limitations of schools, technology must be a priority.

Technology in Schools

Schools were created to provide a service to society by educating students so that they can become productive citizens in today's society. To be productive in today's society, the key to many jobs depends on computer literacy. The inability to use computer technology will put an individual at a distinct disadvantage in the work force

(Givner, 1985). Education, an area in which professional educators were not required to be computer literate, are now being forced to integrate technology. Although, for the most part, educators welcome the promise of the better education that technology will bring (McFarlane, 1997), but there are always those who will not.

Technology, when properly utilized, improves teaching, learning, and the operation of educational institutions (*THE Journal*, 1997). Educators no longer need to debate whether computers should be introduced into our classrooms; the discussion now tends to focus on when they should be introduced and how they should be used in educational environments (Gessard & Loyd, 1984). Education finds itself with the new task of providing an education using technology in a way that will assist students in leading productive and successful lives.

Technology has many uses in a school. Beginning with a broad view of schools, school districts use computers and network software to take attendance within their district, produce documents, and communicate through the intranet and internet. In many specific situations, school sites use computers and computer software to communicate with parents and patrons, to take attendance within their schools, to create grade reports, and to assist in classroom presentations to students. Computers are most frequently used for classroom instruction, teaching basic computer skills, or record keeping (Morrison, 1999; *THE Journal*, 1997). McFarlane (1997) states that teachers are becoming managers of classroom technology.

Researchers have argued that technology has the potential to dramatically change the way in which our schools are structured, providing pressure to do away with the division of instructional time into small blocks and discrete disciplines and to rethink the

way we use physical classrooms and teaching resources (Collins, 1991; Newman, 1990). Just placing a computer into a classroom does not insure that it will be utilized to its full potential or even used at all.

In most professions, there are incentives given for the acquisition of new skills used to enhance employee performance. Somehow, education finds itself lacking these incentives. Perhaps teachers would be more likely to venture out of their comfortable routines if they were offered incentives. Teachers must see the benefits of technology to their own teaching and to their student learning (*THE Journal*, 1997). However, based on studies, teachers' attitudes' toward computer usage does vary widely (Kluever, Lam, Hoffman, Green, & Swearingen., 1994). Only after seeing these benefits will they be truly able to feel comfortable with making the technological changes in their classrooms. Otherwise, it is likely that they will resist this change. Ansoff and McDonnel (1990) state that resistance to change occurs when there is a departure from the historic behavior, culture, and power. This could not be any truer in education. In a research report prepared for the Bertelsmann Foundation by Thomas Reeves (1998) summed up computer based instruction in education. In this he stated,

> - Computers as tutors have positive effects on learning as measured by standardized achievement tests, are more motivating for students, are accepted by more teachers than other technologies, and are widely supported by administrators, parents, politicians, and the public in general.
> - Students are able to complete a given set of educational objectives in less time with CBI than needed in more traditional approaches.

- Limited research and evaluation studies indicate that integrated learning systems are effective forms of computer-based instruction (CBI), which are quite likely to play an even larger role in classrooms in the foreseeable future." (Section 1)

Hueser (1998) stated that there are two aspects of human development, which affect a large number of people in an increasingly technological and knowledge-oriented society. Citing Toffler (1970), Hueser says people are: 1) resistant to change, which appears to grow with increasing age and 2) computer anxiety neurosis and general Technophobia. For change to take place in a school, it is going to take time. Within a school what really matters is the educators' attitudes toward the change or new method. Gbomita (1997) cites and references Roger's (1983) "Diffusion Theory," as what is needed for change and adoption of that change. The diffusion theory is based on five stages: 1) Knowledge (awareness), 2) Persuasion (interest), 3) Decision (trial), 4) Implementation (adoption), and 5) Confirmation (internalization). The theory states that for implementation or adoption of something to take place, the educator or educators involved must go through these steps, starting at one and progressing at their own rate to five (Gbomita, 1997).

Teacher and Principal Attitudes

Attitude can be defined many different ways. It can be referred to as a position indicating action, feeling, or mood (Zimmerman, 2001). Attitude, as defined by Gagne and Briggs (1988) is an internal state which affects an individual's choice of action toward some object, person or event. The *Webster's Ninth New Collegiate Dictionary* (1988) defines attitude as "a mental position with regard to a fact or state, feeling emotion toward a fact or state" (p.114). In the studies of Fishbein (1967), Gibson, Ivancevich, &

Donnelly (1991), Allport (1967), Thurstone (1967), Alix (1997) and Akbaba, and Gulsum (1998) an attitude is defined as a mental and neural state of readiness, organized through experience, exerting directive or dynamic influence upon an individual's response to all objects and situations with which it is related and a sum total of a man's [sic] inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic. No matter which definition of attitude we read, there is one component of attitude that impacts people daily. That is, attitude affects our actions. Like it or not, we are all victims of our own attitudes, affected by them either negatively or positively. For the purpose of clarity in this study, attitude will be defined as a person's feelings toward technology, positive or negative.

It is a given that all people behave differently in different situations. Therefore, it should be expected that when technology is introduced into different situations, the response to it would be different from person to person. Research continues to receive different reactions to the implementation of technology into our educational institutions. While the modern age has witnessed technology's emergence and eventual acceptance, instructors still experience fear or anxiety at the thought of utilizing technology in the classroom. This attitude of fear or anxiety serves as an obstacle unlike any material obstacle, such as money or time constraints, and also serves as an immediate rejecter to technology rather than a passive acceptor of its benefits. Therefore, to surpass this attitude of fear or anxiety, we must analyze what it is. One theory proposes that technology causes fear or anxiety not because it is difficult to learn, but because it may change the existing culture (George, et.al., 1996; Bowers, 1996). In education, the fear of technology by many educators is real. Much of the time it is due to a natural human

condition of dealing with change (Munford, 1983). A study by Bradley (1997) says that 10% of people suffer severe acute computer anxiety with classic physical symptoms and that 20-30% of people experience some discomfort when using a computer. Computer fear is a reality.

Educators

Teachers and administrators are a unique group of professionals. They perform and excel at one of the most important jobs in the world, educating future leaders, of all professions. However, they perform this accomplishment without the proper materials and support needed to enhance their methodology in the classroom. If our focus is to stay true to the original goal of education, to give our children every possible advantage when entering the world, we should see to it that they receive the best possible opportunity to learn now and in the future. To accomplish this, teachers must establish their role in the decision-making process. People who are not in the classroom everyday should not be formulating the policies by which teachers impart knowledge to their students. Teachers should be secure in their professional knowledge of education and take the initiative to create a larger role for themselves in decision-making if they want to increase the boundaries from which they teach our children. While learning the basics of educational psychology, they are informed that students must take an active part in decisions regarding the classroom if they want the students to feel like they have any ownership over their roles in the classroom. Likewise, teachers must have input into these decisions affecting their methodology if they are to feel like the education system that they teach from is one in which they are a vital part. They must be convinced that the time spent on learning to use technology is likely to yield benefits in terms of time saving or improving

student learning. Teachers also need to feel that they are in control both of the technology and of the pace of its introduction (Robertson, 1997). Until they believe or can take part in the decisions being made that affect their classroom, they cannot become "owners" of their classrooms. Wong (1991) maintains that until teachers "own," or believe in what they are teaching, they cannot be effective teachers. The challenge remains for all schools to offer what students need. However, if teachers must remain within the boundaries of their classroom and not have the ability to explore new avenues, this will constrict and restrain the vast amount of knowledge and experience available to tomorrow's future leaders.

In studies separating teachers from a combined group of educators (teachers, administrators and counselors), the attitudes of teachers toward technology were examined. A study conducted by Akbaba and Kurubacak (1998) on teachers' attitudes toward technology found that teachers seem to have positive attitudes toward technology, especially in the area of their students' interests, for the use of research, and when hearing experts' opinions. With the tremendous advances in computer technology, it is imperative that teachers receive proper training on computers (Bradley, 1997). Because of this positive response towards technology, it is important that they receive proper and continuous training on computers as technology continues to advance. Lowther and Sullivan (1994) conducted a study by designing a survey to assess teacher perceptions towards educational technology. Their study stated that teachers' attitudes toward computers and the use of computers varied greatly. Similarly, a study conducted by Pupert (1993) concludes that educators have mixed reactions to the introduction of computers into education.

While it is important to know the attitudes of teachers toward technology in the classroom, it is just as essential to understand those of principals and other school administrators and how they affect students' learning. Research has been conducted concerning these attitudes of principals and administrators and how they influence teachers in the school. Steward (1990) indicated in his dissertation, "A Study of the Attitudes of Southeast Texas Elementary Principals and Teachers Towards Microcomputers," that computer utilization of a school depends on the attitude of the principal toward the computer. Carey (1985) also stated that the principal is now a major source of influence in teachers' decisions to implement computing. The principal was cited more often than any other group or person as a source of influence (Carey, 1985). Carey also declared that support of an innovation by the school principal was the key element in the success of the innovation, such as the implementation of different types of technology into the classroom. Jorde (1985) stated that the administrator as the leader is the catalyst that senses the need for change, sets the pace for the change process, and then monitors its progress. Equally, Ghomita (1997) wrote that it appears that school administrators who want to introduce technological changes can expect a favorable response from their teachers. Based on the research, if the principal's attitude toward computers is positive, then the attempt to implement technology is much more positive and accepted by the teachers.

Educators and education as a whole is constantly going through paradigm shifts (Robertson, 1997). During the last two decades the implementation of technology has begun to totally change the face of education. For this change to take place in the easiest

way possible, there must be constant effort on the part of the educators to learn as much as possible about the computer (Bozionelos, 1997).

Effects on Attitude

Weather, daily routines, and life in general are all vulnerable to one thing, variables. The implementation of technology in schools is no different. It is the victim of many variables that can affect the attitudes of educators. For example, Briggs, Morris & Spier, (1995) stated that subjects who perceive computers to be easier to use and who perceive computers as useful tend to exhibit greater skill performance. Arthur and Hart (1990) identified a positive relationship between cognitive ability and computer familiarity. Arthur and Hart suggested that individuals with low cognitive ability levels might consciously opt not to become familiar with computers due to the challenging nature of the technology, inferring that those with high cognitive ability levels may consciously attempt to become more familiar with computers. Pancer, George, and Gebotys (1992) found that computer behavior was dependent upon attitudes toward computing and that attitudes could be affected by positive images towards computers. The remainder of this literature review will focus on four different variables and their effects on technology in education: age, years of teaching experience, gender, relative years computer experience, and if teachers' attitudes were related to administrator attitudes.

Age is a variable that may be considered a relative factor in all aspects of life. It can be a term used to define a mindset, appearance, and even perspective. Many people spend an enormous amount of the latter part of their lives avoiding the topic of "age." However, because of technology, the components of age are not static; they are dynamic

and redefined every day. Therefore, it is important to clarify the type of "age" being discussed. In this study, the "age" of an educator is being closely examined to determine if it is a variable affecting the use of technology in schools. Age is not being looked at in the same light as years of experience because not all educators with numerous years of experience are older than teachers with very few years of experience.

There are several different ways to define how the age of an educator affects technology. At times, the age of an educator may be referred to through stereotypes and phrases such as "old school" or "set in his/her ways." Previous research tells us that these descriptions are typically true. Although, at times teachers who are chronologically older have fewer years of teaching experience because of the age at which they began teaching. The results of this research reviewed here suggested that these labels do not hit the mark. Research conducted in 1984 by Gessard and Loyd on the effects of computer experience, age, and sex (gender) on attitudes found that significant age effects were apparent in their category of "computer liking," meaning people enjoy or do not enjoy computers. No trend was established in their study. However, a survey of older adults indicated that they were less likely than their younger counterparts to use a computer unless there was a perceived need (Baack, Brown, & Brown, 1991). A study by Piña (1993) on increasing teachers' confidence in using computers for education stated that older learners were found to have a higher degree of anxiety than younger learners. Applebaum (1990) stated that the principle common denominator of computer anxious people is that they were over 30 years old. Another report comparing the effects of age, gender, and prior computing experience upon attitudes toward computers found that both male and female younger students had greater experience and a better attitude toward

computers than older students (Comber, 1997). Based on the research, it is apparent that typically older people show a trend of having a more negative attitude or more difficulty using technology. If this trend is true, it should be assumed that educators would fall into this category.

This researcher found no research directly comparing years of teaching experience and attitude, but literature was found linking years of teaching experience with age. This link makes sense because typically teachers with more years of experience are older. Based on this literature, educators with many years of experience tend to have more trouble with the integration of technology (Henry & Stone, 1997). Stereotypically, educators who have been involved in education for many years are thought of as "set in their ways," by the younger generation of students and educators, and when it comes to technology, they are not thought of as technologically literate.

Contrary to what some may believe, technologically competent teachers do exist. They habitate in schools that have provided their educators with means needed to excel in computer technology. These teachers accept technology more openly and are provided with technology that has a positive impact on the attitude of the school (Pancer, 1992; Robertson, 1997). Gessard and Loyd (1984) state that the more teachers used technology, the more positive their attitude toward technology became. Koohang's (1987 & 1989) studies showed that computer experience was significantly related to computer anxiety and computer liking. Koohang's study also notes that educators with more computer experience received higher mean scores than educators with less computer experience. Thus, schools that provided training and opportunities for their teachers to succeed technologically have teachers with less anxiety towards computers.

There are many implications and impressions gathered from these studies. The research may be encouraging in that the schools that are successful with technology were those that used it as a positive element to their teaching and learning environments. Young or old, inexperienced or experienced, this gives the public the opportunity to view a school not by its teachers' ages or levels of experience, but by its positive and progressive attitude that will shape the future of their students.

Assessment

The term "assess" is defined in the *Webster's Ninth New Collegiate Dictionary* (1988) as to "determine the importance, size, or value" (p.109). The American Association for Higher Education (AAHE) cites three authors for their definition of assessment on their website. Angelo (1995) stated,

> Assessment is an ongoing process aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality; systematically gathering, analyzing, and interpreting evidence to determine how well performance matches those expectations and standards; and using the resulting information to document, explain, and improve performance. When it is embedded effectively within larger institutional systems, assessment can help us focus our collective attention, examine our assumptions, and create a shared academic culture dedicated to assuring and improving the quality of higher education. (p.7)

Astin (1993) considers assessment,

to include the gathering of information concerning the functioning of students, staff, and institutions of higher education. The information may or may not be in numerical form, but the basic motive for gathering it is to improve the functioning of the institution and its people. I used *functioning* to refer to the broad social purposes of a college or university: to facilitate student learning and development, to advance the frontiers of knowledge, and to contribute to the community, and the society. (p.20)

Astin (1991) defines assessment as,

> the systematic basis for making inferences about the learning and development of students. More specifically, assessment is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development. (pp.14-19)

With such an array of definitions used for assessment, it is not surprising that Gathercoal (1995) stated:

> Assessment is probably the most arbitrary and idiosyncratic thing that teachers do. In fact, there may be as many assessment practices as there are teachers. Some teachers administer tests and assign papers; others invite performances and award grades, write comments, or talk with students about their performance; still others appear to read the minds of their students and develop elaborate systems for growth and measurement. Teachers have a professional, ethical, and legal responsibility to convey accurately and truthfully their knowledge about their student's academic achievement. (p.5)

Educators use assessment to evaluate many different tasks. Principals assess the ability of teachers through periodic evaluations. Teachers assess students through periodic evaluations, also in forms of classroom participation, daily work, homework, quizzes, tests, and attitude (Reed, 1996). With all of these measurements, technology could serve as a buffer to keep educators from entering an arbitrary zone. This, in short, means a system set with clear boundaries. A rubric for assessment may be developed from technology, and this in turn would help teachers provide a better, more secure form of assessment that upholds all of their moral, ethical, and legal responsibilities as educators.

Reed (1996) best describes grading in schools. Grades made their entrance into schools in the late 18th century. In 1775, Yale implemented a four-point qualitative grading scale and then in the early 1890s grading became a norm in most schools. Since then, the report card has become a time-honored tradition in education, and grades, whether on a math paper or on a report card, represent a focal part of the essence that is education in the United States (Reed, 1996). However, few teachers when first entering into the field of education are hardly ever adequately prepared for the actual reality of preparing student grades. The grading of student papers and the calculations of these individual grades into a final grade are time consuming and tedious tasks. With the availability of electronic grading programs, this time consuming and tedious task can be limited.

No one likes the feeling of being left behind. Because our society paints pictures of strength and toughness as virtuous, no one likes to be pictured as vulnerable or

incompetent at a task. Likewise, our modern education system does not want to be pictured this way by the general public.

If we do not dramatically and rapidly accelerate the infusion of the new technologies into the nation's schools, we may become as President Reagan said, a "Nation at Risk," more surely than it ever was when that famous and influential report on the need for educational reform was issued in 1983 (Schnieder, 1998). There are two factors which prevent schools from fully integrating technology into their daily routines and successes: budgets and the rapid rate at which technology is changing. Because of this, once again, schools are left behind. While some schools may be "ahead," it is because they have the benefits of donations or possibly a supportive community who has graciously passed bonds. However, these schools probably do not have full integration of technology into their curriculum. This is because there is not a comprehensive long-term plan in place to insure the proper placement and training essential for the utilization of technology in their classrooms. President Reagan declared that the United States was a "*Nation At Risk*" in the 1980s because of our education system's lack of technology in its schools (Schnieder, 1998). When all schools begin to fight the battle for their students, take a role in decision-making, and demand excellence, there will be a chance all schools will be technologically equal, thus, working towards making this a "Nation *Not* At Risk."

Summary

This chapter has provided an overview of the literature relevant to this study. There was no literature found directly addressing educators' attitudes towards the integration of electronic grading software into schools. Therefore, this review covers the components of technology, educators' attitudes, and assessment.

CHAPTER III

METHODOLOGY

Purpose of the Study

The purpose of this study was to determine if the attitude of educators towards the integration of electronic grading programs into their schools was significantly related to the variables; age, years of teaching experience, gender, relative years computer experience, and if teachers' attitudes were related to administrator attitudes. These results will supply school district policy makers with information to take into consideration before, during, and while actively integrating electronic grading software into their educational organization.

The process of integrating electronic grading programs into schools is occurring among many school districts with the hope of helping teachers calculate their grades more effectively and efficiently. Through researching the literature the author found no studies or research directly addressing the issue of educators' attitudes towards the integration of electronic grading programs into schools. Since educators will be the people actually using the electronic grading programs, determining their attitudes towards them is important. The remaining variables that were selected for this study were selected because of a possible relation to the success or failure of the integration of electronic grading programs into schools. These selected independent variables were used based on the computer attitude survey created by Gessard and Loyd (1984). For further inquiry, teacher and administrator attitudes were used individually also because of the significance one may have on the other.

Findings by Gessard and Loyd (1984) and Laiw (2000) suggest that the success of computer utilization is largely dependent upon faculty and student attitudes towards computers. Rowntree (1987) and Tervilliger (1971) state that grading is the process of attaching a letter or number to work. The combination of education and the grading process leads this study in the direction of determining educators' attitudes towards the integration of electronic grading software.

Research Questions

The following research questions were written to be examined in this study:

1. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to chronological age?
2. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of teaching experience?
3. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to gender?
4. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of computer experience?
5. Are teachers' attitudes toward the integration of electronic grading software into the classroom significantly related to administrator attitudes?

Null and Alternative Hypothesis

The following null and alternative hypotheses were developed based on the research questions to be examined in this study:

Null hypothesis 1: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software and chronological age.

Alternative hypothesis 1: There is a statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and chronological age.

Null hypothesis 2: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the school and years of teaching experience.

Alternative hypothesis 2: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and years of teaching experience.

Null hypothesis 3: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educator gender.

Alternative hypothesis 3: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and gender.

Null hypothesis 4: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educators' years of computer experience.

Alternative hypothesis 4: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and educators' years of computer experience.

Null hypothesis 5: There is no statistically significant relationship between the attitude of teachers toward the integration of electronic grading software in the classroom and the attitudes of the administrators.

Alternative hypothesis 5: There is a statistically significant relationship between the attitude of teachers toward the integration of electronic grading software into the classroom and the attitudes of the administrators.

Participants

The sample population examined in this study consisted of secondary schools within two public school districts located in the southwestern portion of the United States. The two districts are referred to in this study as district 1 and district 2. Both school districts are comparable in student population, demographics, and number of educators at the secondary level. These districts have also begun integrating electronic grading programs within the last two years (Appendix A). District 1 has made the "Making the Grade" grading program by Jay Klein Inc. available to its teachers for the last three years and has expected it to be the primary form of grade keeping and calculation for the past two. District 2 has been using the "IGPro" grading program created by National Computer Systems for the past two years and has expected it to be the primary form of grade keeping and calculation for the last year. The data received from district 1's data department states that it has a secondary student population of approximately 8,336; 490 secondary certified school teachers and 23 secondary certified

school administrators. The data received from district 2's data department states that their total secondary student enrollment is approximately 10,428; 427 secondary certified school teachers and 28 secondary certified school administrators (Oklahoma Directory, 2001; Appendix A).

Data Collection and Design

Once permission was granted by The University of Oklahoma's Institutional Review Board to conduct the research for this study, a questionnaire consisting of 25 questions was given to teachers and administrators (educators) in the two school districts. The questionnaire was handed out during school faculty meetings to all of the attending educators. The educators were informed that they were not to put their names on the questionnaire and to answer the questions as honestly and accurately as they could, given the standardized responses available, and if they had any comments to write them either at the bottom of the survey or on the backside. The educators were then asked to fill out the questionnaire and turn it in to the designated location when they were completed.

Questionnaire

This questionnaire was designed to gather data to determine if the attitudes of educators towards the integration of electronic grading software into schools is significantly related to the variables of age, years of teaching experience, gender, and relative years computer experience. Additionally, the study examined if teachers' attitudes were related to administrator attitudes. An extensive literature search was conducted to improve the reliability and validity of the questionnaire. The resources utilized through this search were identified through several different sources such as the Educational Resources Information Center (ERIC) database, the University of

Oklahoma's on-site collection of materials, and different dissertations reporting similar topics. The self-designed instrument, Educators Attitudes Toward Electronic Grading Software (EATEGS) questionnaire (Appendix B), which is used in this study to survey approximately 1000 educators, was modified and developed based on the questionnaires and research conducted by other researchers such as Condit (1995), Cresswell (1999), Delcourt and Kinzie (1991), Gessard and Loyd (1984), Kim (2000), Laiw (2000), and Maher (1994).

These studies surveyed attitudes of school officials such as teachers, counselors, and principals toward computers and technology in general. Maher's (1994) research and survey dealt with secondary principals' computer experience, training, and attitude. He developed his questionnaire by using surveys previously conducted and validated by Delcourt and Kinzie (1991) along with the Computer Attitude Scale (CAS) developed by Gressard and Loyd (1984; 1985). These scales used Likert-type instruments consisting of approximately 30 items which presented both positively-worded and negatively-worded statements. Condit (1985) surveyed counselors' attitudes toward computers, using an instrument originally developed by Zoltan and Chapanis for their study of attitudes of professional persons towards computers.

Based on this review of the research, the primary scale referenced to develop the questionnaire in this study was the CAS by Gressard and Loyd (1985). Permission to use this Likert-type scale and a copy of the CAS was provided by the late Brenda Loyd's husband, Doug Loyd (Appendix C). This scale consisted of 30 items which presented positively-worded and negatively-worded statements of attitudes toward computers and the use of computers. The CAS was selected to be the primary model scale based on the

studies reviewed, in which the researchers used or mentioned that they used the CAS in their study or created their survey or questionnaires guided by the CAS. Gressard and Loyd subjected the CAS to three validation studies which indicated that the CAS was 1) sufficiently stable, 2) had reasonable convergent validity, and 3) was sensitive to attitude changes resulting from computer instruction and experience. Therefore, the CAS appeared to be a convenient and valid measure of computer attitudes (Gressard & Loyd, 1985).

After reviewing these studies and questionnaires, a new questionnaire (EATEGS), which directly addressed the attitudes of educators toward the integration of computer software, was developed. The first five questions on the EATEGS questionnaire were taken verbatim from the CAS survey. Questions 6-10 were written to gather relative computer information and to help get the subjects into the computer mindset. The remaining 15 questions were also taken from the CAS survey, but were rewritten to directly address educators' attitudes towards electronic grading software.

The EATEGS questionnaire consists of three sections: a general information section containing five demographic questions, general questions section containing five questions, and an educators' attitude section which included 15 questions based on a four-point Likert scale: strongly disagree (1), slightly disagree (2), slightly agree (3) and strongly agree (4). Five of the questions in the educators' attitude section were reverse-coded to elicit a "reverse" response. This was done to assist in the validity of the questionnaire. The responses to the 15 attitude section questions were averaged to get a measurable attitude mean score for the attitudes of educators towards the integration of electronic grading software into the classroom.

One public school teacher and three public school principals were invited to review the items on the questionnaire. A three-point Likert scale was used to assess each item on the questionnaire. The three-point Likert scale used 1 as "Non Essential," 2 as "Somewhat Essential," and 3 as "Essential." The items that received a 1 were deleted, while the items that received a 2 were either revised or deleted from the questionnaire. The items that received a 3 remained as written.

The questionnaire was then given to one public school principal and three public school teachers to assess the clarity of each question. A three-point Likert scale was used to assess each item on the questionnaire. The three-point Likert scale uses 1 as "Unclear," 2 as "Needs modification," and 3 as "Clear." The items that received a 1 were removed from the questionnaire and the items that received a 2 were revised or removed from the questionnaire. The items that received a 3 remained on the questionnaire as written. Once this process was completed, the questionnaire was considered ready to administer.

Summary of Pilot Study

A pilot study (a detailed description of the pilot study is included in Appendix D) was conducted to assess the attitudes of educators towards the integration of computers into the classroom. A questionnaire was handed out to two separate groups of secondary certified educators totaling 25 educators. Of the 25 educators who received the questionnaire, 22 returned completed questionnaires. The educators' responses on the questionnaire were then measured for statistical reliability. The answers were averaged and compared.

The overall purpose of this pilot study was to determine if the attitudes of educators toward the integration of computer software into their classrooms was related

to age, gender, and years of experience in education, or if administrator attitudes were related to teacher attitudes. The main purpose of this pilot study was to determine if the questionnaire was valid and reliable. The pilot study consisted of 25 educators in two different school districts located in the southwestern part of the United States. These schools will be referred to as School One and School Two. After completion of this pilot study, two goals were accomplished. First, the reliability and validity of the questionnaire was determined based upon statistical analysis of the responses. Secondly, the research questions posed were tested on a small sample to see if there were any trends based upon the statistical analysis.

The questionnaire was distributed to two separate groups of secondary certified educators during two separate training/staff development sessions in two different school districts. School One consisted of 14 educators, seven male teachers, six female teachers, and one female administrator. School Two consisted of eight educators, five male teachers, two female teachers, and one male administrator. For the purpose of this pilot study the educators from both schools were grouped together, rather than separated by school. Since this study obtained responses from only 22 educators total (20 teachers and two administrators), it is not assumed that this is representative of the population.

The questionnaire consisted of 20 questions, the first four of which included general demographic questions such as age, gender, and years of experience. Questions five through 10 asked questions that dealt with ownership and relative years of computer experience. Questions 11 through 20 asked questions dealing with the educators' attitudes toward the integration of computer software into the classroom. Attitudes were tabulated using a four-point Likert scale, then averaged to derive a mean attitude for each

of the educators. These questions were gathered from an extensive search of the literature and the discovery of other valid and reliable questionnaires created by Maher (1994) and the questionnaire he developed while researching Secondary School Principals' Computer Experience, Training, and Attitude; Gessard and Loyds' (1984) Computer Attitude Scale; and Condit's (1985) survey of counselors' attitudes toward computers. Questions from these surveys/questionnaires were selected and adapted to the topic of this study, the integration of computer software into the classroom. Within the 10 attitude questions, two questions (numbers 16 and 17) were written to elicit a "reverse coding" type of response.

Initially, a reliability test was utilized to determine if the questions that describe the attitude of the educators was internally consistent and reliable. An alpha score of 0.75 or higher was determined as statistically significant and reliable. A covariance matrix was used for this analysis. As seen in Table 1, this test produced a grand mean of 3.47 for the 10 attitude variables (att_1 through att_10). The reliability analysis scale produced an overall reliability alpha score of 0.80, which is statistically significant and reliable. The test mentioned that if question/variable att_7 were removed it would bring up the overall reliability score to a 0.82 (Table 1). Since there were only 10 original attitude questions, it was determined that att_7 would be retained.

Table 1

Pilot Study: Reliability Test

N of Cases = 22

Item Means	Mean	Minimum	Maximum	Range	Max/Min
		Variance			
0.0860	3.4727	2.9091	3.9091	1.000	1.3438

	Scale Mean if item Deleted	Scale Variance if item Deleted	Corrected Item Total Correlation	Squared Multiple Correlation	Alpha if item Deleted
ATT_1	31.1364	15.1710	0.6467	0.7083	0.7631
ATT_2	30.8182	18.2511	0.620	0.4767	0.8080
ATT_3	31.3182	15.1797	0.5529	0.6597	0.7703
ATT_4	31.5909	13.6818	0.7353	0.8404	0.7443
ATT-5	30.9545	15.5693	0.6343	0.7941	0.7673
ATT_6	31.3636	14.0519	0.5858	0.7411	0.7639
ATT_7	31.0909	17.5152	0.7040	0.2369	0.8230
ATT_8	31.2727	12.7792	0.8117	0.8533	0.7294
ATT_9	31.1818	15.6797	0.3878	0.6155	0.7889
ATT_10	31.8182	15.2987	0.2962	0.6237	0.8098

Reliability Coefficients 10 items
Alpha = 0.7969 Standard item alpha = 0.7952

The research questions that were answered in this pilot study are as follows:

1. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their age?
2. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their years of teaching experience?
3. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their genders?
4. Are educators' attitudes toward the integration of computer software into the classroom significantly related to years of relative computer experience?
5. Are teachers' attitudes toward the integration of computer software into the classroom significantly related to administrator attitudes?

The main purpose of this study was accomplished. The 10 attitude questions on the questionnaire were deemed internally consistent and reliable, thus worthy of use in future research. Only one of the research questions asked in this study produced a statistically significant result. A significance of $p < 0.02$ did arise between attitude and years of teaching experience, but as stated earlier this study is not considered to be a representative sample of educators. A much larger sample was deemed as necessary to determine whether or not there is true significance with any of the research questions.

Data Analysis of Current Study

The purpose of this study was to determine the relationships, if any, between educators' attitudes towards electronic grading programs and their ages, years of teaching experience, gender, and years of computer experience. This was accomplished by asking five research questions. The data was statistically analyzed to make inferences

(predictions/decisions) about the population based upon the information contained in the sample (Mendenahall, 1965).

Initially, each school district was individually analyzed to determine if there was any individual significance per district. This was done because each school district has implemented a different electronic grading software package. Both of the two districts' data was then combined to determine any overall significance. These analyses were completed by using the Statistical Package for the Social Sciences (SPSS) software to determine the statistical significance of each variable, as it related to each research question.

The statistical analysis procedures utilized in this study were descriptive statistics, multiple linear regression analysis, and simple linear regression analysis. Descriptive statistics organize and present data in a convenient, useable, and communicable form by calculating the mean, median and mode (Statistics Charts, 1997). The mean is an average of all the scores collected. The median is the middle score of all the scores; it divides the distribution into the lower and upper 50% of the scores. The mode is the score that occurs most frequently in the data.

Linear regression analysis is used to make predictions about a single or multiple values. It has the ability to determine the linear or non-linear relationships between a dependent variable and independent variables, assuming that the dependent variable (Y) is continuous and the independent variables (X) are continuous, categorical or fixed. (Archambault & Schloesser, 2000; StatSoft, 2001). In addition, partial correlations may be obtained in order to analyze the effects of covariation between independent variables and covariates may be removed form the dependent variable in order to observe pure

relationships. A positive correlation will show a direct relationship between the two measured variables and a negative correlation will indicate an indirect relationship between the two variables.

A simple linear regression analysis shows the linear relationship between two variables by telling the amount of variance accounted for by one variable in predicting another variable (Shavelson, 1981). This involves discovering the equation for a line that most nearly fits the given data. Then it is used to predict values for the data. A multiple regression analysis is an extension of a simple regression analysis, except that it examines the relationship between two or more independent variables (Hernon, 1991; Shavelson, 1981).

Descriptive statistics was the first method used to analyze all of the data. This was followed by a multiple linear regression analysis that was used to determine the relationship between the dependent variable -- educator attitudes, a continuous variable; and the independent variables -- age, a continuous variable; years of teaching experience, a continuous variable; gender, a categorical variable; and years of computer experience, a categorical variable. Then a simple linear regression analysis was conducted in determining the relationship between the two continuous variables -- teacher attitude and administrator attitude. Finally, comments written by the educators on the surveys were recorded and grouped into two groups, those in favor of electronic grading programs and those who are opposed to electronic grading programs.

EATEGS Scoring

The scoring methods used for the EATEGS questionnaire was modeled after the CAS instrument created by Gressard and Loyd (1985). The scoring and protocol used to score the EATEGS section is as follows:

- For questions (1, 2, 3, 4, 5, 6, 7, 8, 9, 10) information provided will be taken directly as identified by the respondent.
- For questions (11, 13, 16, 17, 18, 19, 20, 23, 24, 25) (Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).
- For questions (12, 14, 15, 21, 22) (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude. A higher attitude score means that the educator has a more positive/confident attitude towards the integration of electronic grading programs. A lower attitude score represents an educator who is less likely to have a positive/confident attitude towards the integration of electronic grading programs.

With regards to the 15 educator attitude questions, responses that were marked on the line or directly between two measurable responses on the questionnaire were coded as the lower numeric value of the two closest responses. Then the questionnaire was tested for data entry error by reviewing every twenty-fifth questionnaire's entries. A Chronbach alpha reliability test was conducted on the attitude questions to check for internal reliability since it can be used with instruments made up of items that can be scored with three or more possible values (Huck & Cormeir, 1996). The questions written using reverse coding (reverse coded questions: 12, 14, 15, 21, 22) were converted using the SPSS software to protect the data from receiving a negative correlation or response. Finally, an attitude mean was calculated for the each of the sample respondents by averaging their responses to the 15 educator attitude questions.

Summary

This chapter detailed the methods and procedures adopted to conduct the study focusing on a description of the overall research design and procedures. The criteria for data coding and methods were established to improve the reliability and validity of the study. The data was analyzed through descriptive analysis, simple regression (correlations), and a multiple regression. The setting, population, and sample have also been presented. The details of these methods and procedures are vital factors to consider when conducting research.

CHAPTER IV

RESEARCH FINDINGS

Introduction

The purpose of this study was to determine the extent to which the attitude of educators towards the integration of electronic grading programs into their schools was significantly related to certain variables, including age, years of teaching experience, gender, relative years of computer experience, and the influence of administrator attitudes on teachers' attitudes. The results might afford school districts with information to take under consideration before, during, and while actively integrating electronic grading software into their districts. Five research questions were developed and tested using null and alternative hypotheses.

Research Questions

The following research questions were examined in this study:

1. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to chronological age?
2. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of teaching experience?
3. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to gender?
4. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of computer experience?

5. Are teachers' attitudes toward the integration of electronic grading software into the classroom significantly related to administrator attitudes?

Null and Alternative Hypotheses

The following null and alternative hypotheses were developed based on the research questions to be examined in this study:

Null hypothesis 1: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software and chronological age.

Alternative hypothesis 1: There is a statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and chronological age.

Null hypothesis 2: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the school and years of teaching experience.

Alternative hypothesis 2: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and years of teaching experience.

Null hypothesis 3: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and gender.

Alternative hypothesis 3: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and gender.

Null hypothesis 4: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educators' years of computer experience.

Alternative hypothesis 4: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and educators' years of computer experience.

Null hypothesis 5: There is no statistically significant relationship between the attitude of teachers toward the integration of electronic grading software in the classroom and the attitudes of the administrators.

Alternative hypothesis 5: There is a statistically significant relationship between the attitude of teachers toward the integration of electronic grading software into the classroom and the attitudes of the administrators.

This chapter represents the data generated by 770 educators in two separate school districts who completed and returned the EATEGS survey for this study (See Table 2). Multiple regression and correlation analysis procedures were used to analyze the data. Initially, each school district was individually analyzed to determine if there were any individual significance in either district. Both of the two districts' data were then combined to determine any overall significance.

The EATEGS survey contains 25 questions (Appendix B). The first five questions on the EATEGS questionnaire were taken verbatim from the CAS survey. Questions 6-10 were written to gather relative computer information and to encourage the subjects to focus on technology. The remaining 15 questions were also taken from the CAS survey, but were rewritten to directly address educators' attitudes towards electronic grading

software. A Chronbach alpha reliability test was utilized to determine if the questions that describe the attitude of the educators were internally consistent. An alpha score of 0.75 or higher was determined as reliable (Gall, Borg & Gall, 1996). As seen in Table 2, the Chronbach alpha reliability test produced an overall reliability alpha score of 0.896, which is determined reliable.

To examine if there is a significant relationship between educators' attitudes towards the integration of electronic grading software in the classroom and the variables chronological age, years of experience, gender and years of computer experience, a multiple linear regression analysis was utilized. The $p<.05$ level of significance was employed. The variables were as follows:

X1 = Chronological age (AGE)

X2 = Years of experience (YRSEXP)

X3 = Gender (GENDER)

X4 = Years of computer experience (COMPEXP)

Y = Educator attitude (TOTATT).

To examine if there is a significant relationship between teachers' attitudes toward the integration of electronic grading software into the classroom and administrator attitudes, a correlation analysis was utilized. Based on the high discrepancy in the number of administrators and teachers the data was organized by school. The 15 schools each received an administrator mean attitude score and a teacher mean attitude score. Therefore, the correlation analysis is based off of the mean scores of each school, not the total responses. The $p<.05$ level of significance was employed. The variables were as follows:

Table 2

Chronbach Alpha

Mean	Minimum	Variance Item Means Maximum	Range	Max/Min
3.3815	3.0832	3.6658	.5826	1.3438

	Scale Mean if item Deleted	Scale Variance if item Deleted	Corrected Item Total Correlation	Squared Multiple Correlation	Alpha if item Deleted
ATT_1	47.2068	61.3517	.692	.5231	.8852
REVATT2	47.2874	61.7467	.5801	.4075	.8890
ATT_3	47.0572	64.2676	.5301	.3873	.8913
REVATT 4	47.2237	61.2650	.6317	.4818	.8870
REVATT 5	47.3472	60.6566	.5914	.4173	.8887
ATT_6	47.2627	61.9361	.4542	.2423	.8953
ATT_7	47.1730	62.8021	.5368	.3945	.8907
ATT_8	47.4720	60.6480	.6738	.5387	.8854
ATT_9	47.5800	61.3273	.5920	.4085	.8886
ATT_10	47.1834	65.0093	.4598	.3549	.8934
REVATT11	47.3992	61.4745	.5864	.4021	.8888
REVATT12	47.2783	61.2766	.5682	.3637	.8896
ATT_13	47.4889	61.1330	.5746	.4328	.8893
ATT_14	47.5228	61.8904	.5881	.4515	.8888
ATT_15	47.6398	61.8714	.5488	.3273	.8903

Reliability Coefficients	15 items	
N = 720	Alpha = 0.8961	Standard item alpha = 0.8979

X = Administrator attitude (ADMIN)

Y = Teacher attitude (TEACHER).

Multiple Linear Regression Analyses

The purpose of utilizing a multiple linear regression analysis was to determine if there was any significant relationship between educators' attitudes towards the integration of electronic grading software in the classroom and chronological age, years of experience, gender and years of computer experience. The multiple linear regression analysis was conducted by entering the educator attitude (TOTATT) as the dependent variable and chronological age (AGE), years of experience (YRSEXP), gender (GENDER) and years of computer experience (COMPEXP) as the independent variables. The analysis of this study was conducted by entering all of the independent variables simultaneously.

School District 1

School district 1 is comprised of data generated by 333 educators (See Table 3). Analysis of variance was used to test the overall model and determined it to be significant ($p<.05$) with an F (4,327) value of 14.850. The model determined 15.4% variance accounted for ($R^2 = .154$) with the residual being the remaining unexplained variance (See Table 4).

Table 5 includes the summary of the multiple regression analysis for the individual variables. Two variables were found to be statistically significant predictors of the educator attitudes, years of experience (YRSEXP) and years of computer experience (COMPEXP). The variable years of experience (YRSEXP) also displayed a negative regression coefficient.

Table 3

EATEGS Respondents Survey Data

District	Number of Schools	Male	Female	Teachers	Administrators	Total
1	7	108	225	309	24	333
2	8	106	331	416	21	437
Total	15	214	556	725	45	770

$p<.05$

Table 4

Analysis of Variance for Significance of Model

(Based on a Multiple R^2 of .154 and R of .392)

District 1

	Df	SS	MS	F	P
Regression	4	14.959	3.740	14.850	.000*
Residual	327	82.347	.252		

*p<.05

Table 5

Summary of Multiple Linear Regression Analysis

District 1

Variables	B	Standard Error of b	Beta	F	P
GENDER	4.911E-02	.060	.042	.823	.411
AGE	6.504E-04	.004	.012	.159	.874
YRSEXP	-1.201E-02	.004	-.209	-2.718	.007*
COMPEXP	.194	.028	.353	6.885	.000*

*p<.05

School District 2

School district 2 is comprised of data generated by 437 educators (See Table 3). Analysis of variance was used to test the overall model and determined it to be significant ($p<.05$) with an F (4,432) value of 28.825. The model determined 21.1% variance accounted for ($R^2 = .211$) with the residual being the remaining unexplained variance (See Table 6).

Table seven includes the summary of the multiple regression analysis for the individual variables. Two variables were found to be statistically significant predictors of the educator attitudes, years of computer experience (COMPEXP) and years of experience (YRSEXP). The variable years of experience (YRSEXP) displayed a negative regression coefficient.

Total Sample

The total sample is comprised of data generated by 770 educators (See Table 3). Analysis of variance was used to test the overall model and determined it to be significant ($p<.05$) with an F (4,764) value of 43.970. The model determined 18.7% variance accounted for ($R^2 = .187$) with the residual being the remaining unexplained variance (See Table 8).

Table nine includes the summary of the multiple regression analysis for the individual variables. Two variables were found to be statistically significant predictors of the educator attitudes, years of computer experience (COMPEXP) and years of experience (YRSEXP). The variable years of experience (YRSEXP) and chronological age (AGE) displayed a negative regression coefficient. Gender showed a much more significant statistical change when the entire sample was combined.

Correlation Analysis

The purpose of utilizing a correlation analysis was to determine if there was any significant relationship between teachers' attitudes toward the integration of electronic grading software into the classroom and administrator attitudes. The correlation analysis was conducted by entering the teacher's attitude (TEACHER) and administrator attitude (ADMIN).

School District 1

A correlation analysis was used to determine if there was any significant relationship between teacher and administrator attitudes. District 1 revealed no statistically significant correlation ($r=.361$) at $p<.05$. Table 11 is the summary of the correlation analysis for the individual variables.

School District 2

A correlation analysis was used to determine if there was any significant relationship between teacher and administrator attitudes. District 2 revealed a statistically significant correlation ($r=.798$) at $p<.05$. Table 12 is the summary of the correlation analysis for the individual variables.

Total Sample

A correlation analysis was used to determine if there was any significant relationship between teacher and administrator attitudes. The total sample revealed a statistically strong significant correlation ($r=.735$) at $p<.05$. Table 12 is the summary of the correlation analysis for the individual variables.

Table 6

Analysis of Variance for Significance of Model

(Based on a Multiple R^2 of .211 and R of .459)

District 2

	Df	SS	MS	F	P
Regression	4	29.951	7.488	28.825	.000*
Residual	432	112.221	.260		

*p<.05

Table 7

Summary of Multiple Linear Regression Analysis

District 2

Variables	B	Standard Error of b	Beta	F	P
GENDER	7.292E-02	.057	.055	1.270	.205
AGE	-2.404E-03	.004	-.047	-.671	.503
YRSEXP	-1.460E-02	.004	-.259	-3.728	.000*
COMPEXP	.225	.029	.338	7.865	.000*

*p<.05

Table 8

Analysis of Variance for Significance of Model

(Based on a Multiple R^2 of .187 and an R of .433)

Total Sample

	Df	SS	MS	F	P
Regression	4	45.061	11.265	43.970	.000*
Residual	764	195.739	.256		

*p<.05

Table 9

Summary of Multiple Linear Regression Analysis

Total Sample

Variables	B	Standard Error of b	Beta	F	P
GENDER	5.651E-02	.041	.045	1.371	.171
AGE	-1.138E-03	.003	-.022	-.423	.672
YRSEXP	-1.382E-02	.003	-.243	-4.724	.000*
COMPEXP	.213	.020	.350	10.667	.000*

*p<.05

Table 10

Correlation Analysis for Significance of Model

District 1

	TEACHER	ADMIN
Pearson Correlation	1.000	.361
Sig. (2-tailed)		.426
Sum of Squares and Cross Products	6.489E-02	2.600E-02
Covariance	1.081E-02	4.333E-03
Mean Attitude	3.3588	3.4063
SD	.1626	.4929
N	7	7

$p<.05$

Table 11

Correlation Analysis for Significance of Model

District 2

	TEACHER	ADMIN
Pearson Correlation	1.000	.798*
Sig. (2-tailed)		.018
Sum of Squares and Cross Products	.185	.448
Covariance	2.644E-02	6.398E-02
Mean Attitude	3.3588	3.4063
SD	.1626	.4929
N	8	8

*p<.05

Table 12

Correlation Analysis for Significance of Model

Total Sample

	TEACHER	ADMIN
Pearson Correlation	1.000	.735*
Sig. (2-tailed)		.002
Sum of Squares and Cross Products	.280	.539
Covariance	2.001E-02	3.849E-02
Mean Attitude	3.4007	3.4967
SD	.1414	.3704
N	15	15

*p<.05

Summary

Chapter IV has provided statistical analyses of the relationships between educators' attitudes towards the integration of electronic grading software in the classroom and chronological age, years of experience, gender and years of computer experience. These statistical analyses also help with determining if there was any statistically significant relationship between teachers' attitudes toward the integration of electronic grading software into the classroom and administrator attitudes. This was conducted through the use of a multiple linear regression and correlation analyses.

The multiple linear regression analysis found an overall relatively low variance accounted for in all of the aforementioned reports. This indicates that there are other factors in existence that may affect educator attitude. Although, in all of the reports there was statistical significance with computer experience (COMPEXP) and a negative correlation with years of experience (YRSEXP).

The correlation analysis also found there to be an overall low variance accounted for with both variables. Therefore, once again suggesting that there are other factors in existence such as, but limited to past experiences, training, computer dependability or computer availability that may affect educator attitude. The correlation analysis did produce a statistical significance in school district two and a strong statistical significance in the total sample.

CHAPTER V

SUMMARY. CONCLUSIONS, AND RECOMMENDATIONS

Summary

This chapter will serve as a summary of the various parts of the study. It will restate the study's procedures, purpose, research questions, and null and alternative hypotheses. Along with these it will also contain conclusions and recommendations for future research.

The primary goal of schools as stated in this study is to prepare students to lead positive and productive lives outside of school. Technology in schools today is a necessity. Studies have shown that the computer is an effective learning and teaching tool (Liaw, 2000; McFarlane, 1997). School districts have been attempting to integrate technology in various ways. One way has been through the integration of electronic grading programs. The process of assessing students is an everyday part of education, though, at times this is a very time consuming process for educators. With the integration of electronic grading programs, the time educators actually spend on the calculation of grades has the opportunity to be reduced along with the ability that electronic grading programs afford teachers to produce professional looking, informative and timely documents regarding students' grades.

An awareness of educator's attitude towards the integration of electronic grading programs is essential. Based on research a positive attitude towards the integration of a technological/computer applications is important for its success (Brush, Armstrong, Barbrow & Ulintz, 1999; Cote & Levine, 2000; Gettys & Fowler, 1996; Hayes & Robinson, 2000; McKinnon, Nolan & Sinclair, 2000; Ruggiero, 1998). According to

George and Sleeth (1996) many educators have a fear of integrating any type of technology into their classrooms. Therefore, finding the factors which inhibit an educator from possessing a positive attitude towards the integration of electronic grading programs is essential.

The primary purpose of this study was to determine if the attitude of educators towards the integration of electronic grading programs into their schools was significantly related to certain variables, including age, years of teaching experience, gender, relative years of computer experience, and the influence of administrator attitudes on teachers' attitudes. The following five research questions were developed and tested using null and alternative hypotheses.

Research Questions

The following research questions were written to be examined in this study:

1. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to chronological age?
2. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of teaching experience?
3. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to gender?
4. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of computer experience?

5. Are teachers' attitudes toward the integration of electronic grading software into the classroom significantly related to administrator attitudes?

Null and Alternative Hypotheses

The following null and alternative hypotheses were developed based on the research questions to be examined in this study:

Null hypothesis 1: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software and chronological age.

Alternative hypothesis 1: There is a statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and chronological age.

Null hypothesis 2: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the school and years of teaching experience.

Alternative hypothesis 2: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and years of teaching experience.

Null hypothesis 3: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educator gender.

Alternative hypothesis 3: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and gender.

Null hypothesis 4: There is no statistically significant relationship between the attitude of educators toward the integration of electronic grading software into the classroom and educators' years of computer experience.

Alternative hypothesis 4: There is a statistically significant relationship between the attitude of educators toward the integration electronic grading software into the classroom and educators' years of computer experience.

Null hypothesis 5: There is no statistically significant relationship between the attitude of teachers toward the integration of electronic grading software in the classroom and the attitudes of the administrators.

Alternative hypothesis 5: There is a statistically significant relationship between the attitude of teachers toward the integration of electronic grading software into the classroom and the attitudes of the administrators.

The sample examined in this study consisted of 15 secondary schools within two public school districts located in the south-central portion of the United States. The two districts are referred to in this study as district 1 and the district 2. Both school districts are comparable in student population, demographics, number of educators at the secondary level, and that they both have begun the integration of electronic grading programs within the last two years (Appendix A). A total of 770 educators returned completed surveys (Table 3).

The statistical methods used to determine relationships between the independent variables -- age, a continuous variable; years of teaching experience, a continuous variable; gender, a categorical variable; and years of computer experience, a categorical variable -- and educators' attitudes was a multiple linear regression analysis. A

correlation analysis was used to analyze the two continuous variables -- teacher attitude and administrator attitude. Each district was individually analyzed and then the two were analyzed as a combined group. Finally, comments written by the educators on the surveys were recorded and grouped into two groups, those in favor of electronic grading programs and those who are opposed to electronic grading programs.

Conclusions

This section contains the conclusions of this study as they are related to the data obtained through statistical analysis. This study surveyed the secondary schools educators in a total of 15 schools in two separate school districts located in the south-central portion of the United States. A total of 720 educators returned completed surveys and were initially separated by district and analyzed. The surveys were then combined into a total sample and analyzed as a whole.

The following conclusions were reached based on five research questions concerning educators' attitudes towards the integration of electronic grading programs into schools:

1. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to chronological age?

The chronological age of educators was not found to be statistically significant for either of the two districts or the sample as a whole. District 1 received a $p = .874$, District 2 received a $p = .503$, and entire sample received a $p = .672$. Accordingly, the null hypothesis was not rejected for district 1, district 2 and the entire sample.

2. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of teaching experience?

The number of years of teaching experience of an educator has shown a high level of significance and a negative beta score in all of the three categories. District 1 reported a significance level of p = .007, district 2 and the entire sample reported a significance level of p = .000 which is statistically significant. Accordingly, the null hypothesis was rejected for district 1, district 2 and the entire sample. The alternative hypothesis was accepted for district 1, district 2 and the entire sample.

3. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to gender?

The gender of an educator was not found to be statistically significant in any of the three categories. District 1 reported a significance level of p = .411, district 2 reported a significance level of p = .205, and the entire sample reported a significance level of p = .171. Accordingly, the null hypothesis was not rejected for district 1, district 2 and the entire sample.

4. Are educators' attitudes toward the integration of electronic grading software into the classroom significantly related to years of computer experience?

The number of years of computer experience of an educator has shown a high level of significance in all of the three categories. District 1, district 2 and the entire sample reported a significance level of p = .000 which is statistically significant. Based on these

results the null hypothesis was rejected for district 1, district 2 and the entire sample. The alternative hypothesis was accepted for district 1, district 2 and the entire sample.

5. Are teachers' attitudes toward the integration of electronic grading software into the classroom significantly related to administrator attitudes?

The statistical results regarding teachers' attitudes as they are related to administrator attitudes has shown a wide range statistical correlation. District 1 reported a $r = .361$, indicating no significant correlation. District 2 reported a $r = .798$, and the entire sample reported a $p = .735$, which are both statistically strong correlations. Accordingly, the null hypothesis was not rejected for district 1. For district 2 and the entire sample, the null hypothesis was rejected and the alternative hypothesis was accepted.

The results of the statistical analyses have proved to be very informative. Based on this study's findings, it is apparent that the variables age and gender are not statistically related to the integration of electronic grading programs, though, the variable age did report a negative beta implying that the higher the age the lower the attitude of the educator towards the integration of electronic grading programs. This finding is found to be consistent with previous research. Toffler (1970) states that people are more resistant to change with increasing age. Baak, et al. (1991), Henry & Stone (1997), Piña (1993) and Applebaum (1990) state that older people have less confidence and more anxiety towards technology than do younger people.

The variables number of years teaching experience and relative computer experience do show significance in both of the individual districts along with the entire sample. However, not only did the variable years teaching experience report a statistical

significance in district 1 and the entire sample, it also, along with age, reported a negative beta implying that the more years of teaching experience educators have the lower their attitude toward the integration of electronic grading programs. This also appears to be consistent with findings from other studies. Henry & Stone (1997) linked years of teaching experience with teacher age, stating that typically teachers with more years of experience tend to have more trouble with the integration of technology. The results realized in this study regarding relative years computer experience also maintains consistency with previous research. Koohang (1987, 1989) found that computer experience was significantly related to computer anxiety and computer liking. He also states that educators with more computer experience showed higher attitude scores than those who did not.

Teachers' attitudes were found to be significantly related to administrator attitudes in district 2 and the entire sample. Interestingly, district 1 and district 2 did show a rather variant correlation with coefficients (see tables 10 & 11). This could be a result of the low number of total administrators in relation to the total number of teachers. Or it could also show that in different districts a wide range of other variables may influence the way teachers' attitudes are related to administrator attitudes. More research needs to be conducted in this area. Research states that if the administrators' attitudes toward technology is positive, then teachers' attitudes are more accepting and positive; no other group or person has been cited as often as the administrator as a source of influence (Carey, 1985; Ghomita, 1997; Jorde, 1985; Steward, 1990).

Although this study is not a qualitative study, the educators who completed the EATEGS survey had the opportunity to write any comments or opinions they might have

concerning electronic gradebooks. Based on their comments a few trends were found and listed. After reviewing all of the comments it was apparent that more positive comments than negative comments were written. Many of the comments made were the same. The remainder of this section is a summary of the most common comments. Many of the educators made the statement that they felt as if they had the opportunity to receive ample training on the electronic grading program used in their district. Others felt as if they needed more training, not only on grading programs, but also with computers in general. Some examples are listed below:

- The school has provided plenty of training, but I haven't taken advantage of it.
- The school trained me, but I had to play with the program to learn it. It is a time efficient tool.
- I need more training!

Of course there were those comments made by educators who "Love" and those who "Hate" electronic grading programs and computers in general. Some examples are listed below:

- I love electronic grading!
- I don't feel the program is user friendly, was it made by a teacher?
- I like my old reliable hand made gradebook, but this is time efficient.
- Computers are overrated.
- Electronic gradebooks don't scare me until I lose my data.
- Electronic gradebooks and computers are the best invention ever!

The majority of educators who made comments did state that electronic grading programs were very helpful, when they worked. In conclusion a teacher from district 2 made the

comment that might sum it all up when she wrote she felt as if "sometimes the tail wags the technology dog."

Recommendations

The use of technology in schools is inevitable, therefore finding ways in which it will not only help students be successful in the real world, but also help educators become more efficient in their bookkeeping is important. This is why many school districts are looking at implementing electronic grading programs into their districts. The successful integration depends on many different facets, but most of all its successful integration depends on the attitude of the educators actually using it on a day-to-day basis.

This study has surveyed many educators in two different school districts, attempting to determine what has made their implementation of electronic grading programs successful. Based on the results of this study the following recommendations are offered:

1. It should be a major priority of the school officials who will be attempting to integrate electronic grading programs into a school district to know who they are asking to use this program. They should consider the age, years of teaching experience, years of computer experience and what the site level administrators' attitudes are towards electronic grading programs. Knowing what you are going to face beforehand is very important. Plan ahead.
2. Local school officials should conduct site level surveys to address such issues as what kind of grading programs educators are currently using.

3. Local school officials should conduct site level surveys addressing site level administrators in an attempt to obtain their attitudes and opinions of electronic grading programs and what they think their individual site needs.
4. Local school officials should provide a representative sample group of educators the opportunity to try out several different electronic grading programs and get site level opinions on which grading program should be selected.
5. Local school officials should decide what reports will be required of educators and only consider electronic grading programs which can easily produce those reports.
6. Local school administrators should know their district system requirements and only pursue electronic grading programs which are supported by their system.
7. Local school administrators should provide adequate training for all individuals who will potentially be required to use the electronic grading programs. This includes, but is not limited to, teachers and administrators.
8. Lastly, university administrator and teacher preparation programs should assure that aspiring educators have the opportunity to explore different types and aspects of technology which is present in schools today. This will allow for more computer experience for educators.

To add to the body of research, future research in the area of integrating electronic grading programs into schools can be conducted in the following areas:

1. Research should be performed in the area of analyzing how teachers actually figure grades in order to assist in a district's ability to integrate electronic grading programs.

2. Research on the ability of different electronic grading programs to interface with different school accounting systems. Many districts have school accounting systems that do not contain a teacher grade book program. Therefore, knowing how electronic gradebook programs work with different accounting systems would be very useful.
3. A qualitative research study on what teachers want in an electronic gradebook. Note the electronic gradebook they are currently using. List its pros and cons and, if this is done with enough educators, a true composite list of what is needed and expected in an electronic grade book can be created for that district.
4. Research a sample of electronic gradebook software creators. Look to see if the people creating them have actual experience in education or are they just statisticians. Do they pilot their programs in actual schools? What do they do about requests and suggestions made by educators? How often do they produce updates or upgrades?
5. Research on how and if the use of electronic grading programs effect the grading practices of teachers.
6. Research focusing more on the school administrator's role with regards to electronic grading programs.

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APPENDICES

APPENDIX A

	District 1	District 2
Student Population	8,336	10,428
Secondary Teachers	490	427
Secondary Administrators	23	28
Socioeconomic Data		
*Caucasian	74%	70%
*Black	4%	17%
*Asian	4%	4%
*Hispanic	5%	6%
*Native American	13%	3%
*Free/Reduced lunch	24%	32%

District 1 uses the Making the Grade grading program by Jay Klein Inc.

District 2 uses the IGPro grading program by National Computer Systems

* Socioeconomic data gathered from the state "Office of Accountability" report 2000

APPENDIX B

EDUCATORS' ATTITUDES TOWARD THE INTEGRATION OF ELECTRONIC GRADING SOFTWARE INTO THE CLASSROOM (EATEGS) QUESTIONNAIRE

The purpose of this questionnaire is to gather information concerning people's attitudes toward electronic grading software. It should take about five minutes to complete this survey. All responses are kept confidential. Please return the survey when completed.

General Information

Please circle or fill in the correct response that relates to you as an educator at the present time.

1. Classification: **Classroom Teacher** **Administrator** **Counselor**
2. Gender: **Male** **Female**
3. Age: _____
4. Total years experience in education _____
5. Experience with learning about or working with computers:
   0-4 years **5-10 years** **11-15 years** **16 + years**

General Questions

6. I feel comfortable/confident using a computer.	**YES**	**NO**
7. I have a computer at my home.	**YES**	**NO**
8. I have Internet access at my home.	**YES**	**NO**
9. Computers are easily accessible at my school.	**YES**	**NO**
10. I have a computer in my classroom/office.	**YES**	**NO**

Educator Attitude Scale

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a checkmark in the space under the label, which is closest to your agreement or disagreement with the statement.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
11. Electronic grading programs do not scare me at all.....				
12. Working with electronic grading programs make me very nervous.....				
13. Electronic grading programs are worthwhile.....				
14. I am not the type that does well with electronic grading programs.....				
15. I will do as little work with electronic grading programs as possible.....				
16. I feel that I am a competent electronic grading program user.....				
17. I feel that there is a definite need for electronic grading software in the classroom.....				
18. I feel confident using different computer programs.....				
19. When there is a problem with my electronic grading program that I can't solve I will stick with it until I have it solved.....				
20. I think it is important for me to learn to use different computer software..				
21. It seems as if everyone else but me knows what they are doing when it comes to using electronic grading programs.....				
22. I avoid using electronic grading programs as much as possible.....				
23. I do not feel intimidated by a computer program.....				
24. The challenge of learning about new technological ways of assessing students is exciting to me.....				
25. My training on electronic grading software is adequate.....				

APPENDIX C

LYOD AND GRESSARDS CAS PERMISSION LETTER

Thank you for your inquiry about the Computer Attitude Scale.

As you may know, Brenda Loyd, author of the CAS, was President of the National Council on Measurement in Education (NCME) at the time of her death in 1995. Dr. Loyd's co-author, Clarice Gressard, has asked me to handle all requests for permission to use their survey, and to provide the CAS survey and scoring protocol to researchers who wish to use their scale.

Therefore, in response to your inquiry, I am attaching a copy of the Loyd/Gressard survey of attitudes towards computers, in an MSWord document (survey.doc). If you have any problem reading it please let me know. Unfortunately I have no further information about the use of the CAS beyond that provided in this message and the attached document.

The survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38 (Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).

For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude.

Four subscores can also be obtained from the questions.

Anxiety:	1, 5, 9, 13, 17, 21, 25, 29, 33, 37
Confidence:	2, 6, 10, 14, 18, 22, 26, 30, 34, 38
Liking:	3, 7, 11, 15, 19, 23, 27, 31, 35, 39
Usefulness:	4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

Permission is granted for use of this scale. In any publications arising from its use, please be sure to credit the authors, Brenda H. Loyd and Clarice P. Gressard.

Thanks for your interest. Best wishes.

Doug Loyd

APPENDIX D

PILOT STUDY

The purpose of this pilot study was to determine if the attitudes of teachers and administrators (educators) toward computer software were affected by age, gender, years experience or if administrator attitudes affect teacher attitudes. The pilot study will consisted of 25 educators in two different school districts located in the southwestern part of the United States. After completion of this pilot study, two goals were accomplished. First, the reliability and validity of the questionnaire will be determined based upon statistical analysis of the responses of the sample and feedback received from a select group of administrators and teachers. Secondly, the research questions posed will be tested on a small sample to see if there are any trends based upon statistical analysis.

The questionnaire (Appendix) was distributed to two separate groups of educators (total of 25) during two separate training/staff development sessions. A total of 22 educators returned a completed questionnaire. School one consisted of 14 educators, seven males and seven females, and a female administrator. School two consisted of eight educators, six males and two females, and a male administrator. For the purpose of this study the educators from both schools were grouped together, rather than separating by school. As this study consists of only 22 educators, including two administrators, it will not be assumed that this is representative of the population.

The questionnaire distributed consisted of 20 questions. The first four questions were composed of general demographic questions such as age, gender, and years experience. Questions five through ten asked questions that deal with ownership and relative years of computer experience. Questions 10 through 20 asked questions dealing

with the educators' attitudes toward the integration of computer software into the classroom. Attitudes were tabulated using a four-point Likert scale, then averaged to derive a mean attitude for each of the educators. These questions were gathered from an extensive search of the literature and the discovery of other valid and reliable questionnaires created by Maher (1994) and the questionnaire he developed while researching Secondary School Principals' Computer Experience, Training and Attitude, Loyd and Gressards (1984) Computer Attitude Scale, and Condit's (1985) survey of counselors' attitudes toward computers. Questions from these separate questionnaires were selected and adapted to the topic of this study, the integration of computer software into the classroom. Within the 10 attitude questions, two questions were written to elicit a "reverse coding" type of response. These questions were numbers 16 and 17.

This study researches educators' attitudes toward the integration of computer software into their classrooms. The research questions that will be answered in this study are as follows:

1. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their age?
2. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their years of teaching experience?
3. Are educators' attitudes toward the integration of computer software into the classroom significantly related to their gender?

4. Are educators' attitudes toward the integration of computer software into the classroom significantly related to years of relative computer experience?

5. Are teachers' attitudes toward the integration of computer software into the classroom significantly related to administrator attitudes?

Before the questionnaire was distributed it was initially tested for validity and reliability. The questionnaire was given to two separated groups of educators to review for essential questions and clarity based on the research questions. The educators who received the questionnaire for the essential and clarity tests are not included in the research sample. First, the questionnaire was given to one schoolteacher and three school administrators to review the items to determine if they were essential to the study. They were asked to rate the survey on a three-point Likert scale. A rating of one was "Non Essential," two as "Somewhat Essential" and three as "Essential." The items which, received a one, were deleted while the items which received a two were modified and remained. The items which received a three were left unaltered on the questionnaire. Next, the corrected questionnaire was given to three school administrators and one schoolteacher to check for the clarity of each question. Once again, a three-point Likert scale was used to determine clarity, one as "Unclear," two as "Needs Modification," and three as "Clear." The items that received a one were removed from the questionnaire, the items which received a two were revised and remained on the questionnaire, and the items which received a three remained as unaltered on the questionnaire.

Data collected were entered into the Statistical Package for the Social Sciences (SPSS) statistical software for analysis. The data were grouped into different categories

and coded. The categories represent different questions on the questionnaire. The coding in place gives the responses a numeric value so they can be statistically analyzed. Variables included in this study: "class" which represents the educator's classification of either a teacher (1) or an administrator (2); "gender" which represents either male (1) or female (2); "age" which represents the actual age of the educator; "yearsexp" which represents the actual numbers of years the educators has been in education based on a four point scale, "6 mos or less," "6 mos – 1 yr," "1-2 years," "2 + years"; "compyx" which indicates within a range using a four point Likert scale how many years of computer experience the educator has had and"att_1" through "att_10" represents the 10 questions representing the educator's attitude towards the integration of computers into the classroom. It discovered that when entering the data for "yearsexp" that every respondent in the sample answered "4" or two plus years of computer experience; therefore, the results of "yearsexp" will not be reported. In future research this question will be modified to ask for an exact number of years of experience.

Initially, a reliability test was utilized to determine if the questions that describe the attitude of the educators was internally consistent and reliable. An alpha score of .75 or higher will be determined statistically significant and reliable. A covariance matrix will be used for this analysis. As seen in table 1, this test produced a grand mean of 3.47 for the 10 attitude variables (att_1 through att_10). The reliability analysis scale produced an overall reliability alpha score of 0.80, which is statistically significant and reliable. The test mentioned that if question/variable att_7 were removed it would bring up the overall reliability score to a 0.82 (Table 1). Since there are only 10 original attitude questions, it was determined that "att_7" would remain.

Table 1

Reliability Test

N of Cases = 22

Item Means Variance	Mean	Minimum	Maximum	Range	Max/Min
0.0860	3.4727	2.9091	3.9091	1.000	1.3438

	Scale Mean if item Deleted	Scale Variance if item Deleted	Corrected Item Total Correlation	Squared Multiple Correlation	Alpha if item Deleted
ATT_1	31.1364	15.1710	0.6467	0.7083	0.7631
ATT_2	30.8182	18.2511	0.620	0.4767	0.8080
ATT_3	31.3182	15.1797	0.5529	0.6597	0.7703
ATT_4	31.5909	13.6818	0.7353	0.8404	0.7443
ATT-5	30.9545	15.5693	0.6343	0.7941	0.7673
ATT_6	31.3636	14.0519	0.5858	0.7411	0.7639
ATT_7	31.0909	17.5152	0.7040	0.2369	0.8230
ATT_8	31.2727	12.7792	0.8117	0.8533	0.7294
ATT_9	31.1818	15.6797	0.3878	0.6155	0.7889
ATT_10	31.8182	15.2987	0.2962	0.6237	0.8098

Reliability Coefficients	10 items
Alpha = 0.7969	Standard item alpha = 0.7952

The descriptive statistics were then run to obtain an overall feel for the data. The descriptive statistics collected were the mean, median, and mode for age, yearsexp, and compyx. There were a total of 22 respondents to the questionnaire, thirteen (40.9%) were females and nine (51.1%) were males. The mean values calculated for "age" was 37.09, "yearsexp" was 10.29, and four for "compyx." The calculated median for "gender was two, "age" was 36, "yearsexp" was nine and for "compyx" was four. The calculated mode for "gender" was two, "age" was 25, "yearsexp" was two and for "compyx" were four (Table 2). This data tells us that the sample average age is in the mid 30's and primarily comprised of females with four or more years of computer experience.

A new variable was calculated to give the mean of the 10 attitude questions (att_1 through att_10) and called "attitude." Once this variable was calculated it was compared to gender via a t-test to see if there were any significant differences in attitude of males and females. A t-test was run because it will only compare two different groups. The results of the t-test found in the Levene's test for Equality of Variances that there are equal variances assumed at $p = 0.04$. Therefore, there is no significant difference between gender and attitude at $p = 0.35$ which is greater than 0.05 (Table 3).

Another t-test was calculated to determine whether or not there were any significant differences between the attitudes of teachers and administrators. The results of the t-test found in the Levene's Test for Equality of Variances at 0.26 were not significant, therefore, equal variance will not be assumed. Based on this result, there was no significance between the means of teachers and administrators at $p = 0.381$. Interestingly, the means of teachers (3.46) and administrators (3.60) attitudes were found to be similar (Table 4).

Table 2

Frequencies

		Gender	Age	Yearsexp	Compyx
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		1.5909	37.0909	10.2955	4.00
Median		2.00	36.00	9.00	4.00
Mode		2.00	25.00	2.00	4.00

		Frequency	Percent	Valid %	Cumulative %
Valid	Male	9	40.90	40.90	40.90
	Female	13	59.1	59.10	100.00
	Total	22	100.00	100.00	

Table 3

T-test Gender Attitude Variables

Gender	N	Mean	St. Deviation	Std. Err. Mean
Male	9	3.5778	0.2279	7.597E-02
Female	13	3.40	0.5244	0.1454

	Levene's Test For Equality of Variances				
	F	Sig.	t	sig. 2 tailed	Mean diff.
Equal variances assumed	5.126	0.035	0.951	0.353	0.1778
Equal variances not assumed			1.083	0.293	0.1778

Table 4

T-test Teacher/Administrator Attitude Variables

Gender	N	Mean	St. Deviation	Std. Err. Mean
Male	20	3.46	0.4489	0.1004
Female	2	3.60	0.1414	0.1000

	Levene's Test For Equality of Variances				
	F	Sig.	t	sig. 2 tailed	Mean diff.
Equal variances assumed	1.335	0.262	-0.430	0.672	-0.1400
Equal variances not assumed			-0.988	0.381	-0.1417

The variables "age" and "yearsexp" contain age specific and years of experience specific data which is not categorized into groups, therefore, to compute an analysis of variance (ANOVA), these two variables were recoded into variables which had a numerical value of one, two, three, or four. "Age" was recoded to "agecat," determined by taking the different ages and grouping them into four categories: 20 years old to 29 years old (1); 30 years old to 39 years old (2); 40 years old to 49 years old (3); and 50 years old or older (4). "Yearsexp" was recoded to "yrsexcat" by converting the educators' different years of teaching experience and grouping them into four categories: 0 to 6 years of teaching experience (1); 7 to 12 years of teaching experience (2); 13 to 18 years of teaching experience (3); and 19 or more years of teaching experience (4). Once these variables were recoded a one-way ANOVA was calculated.

The findings of the ANOVA that compared "yrsexcat" to "attitude" were shown to be statistically significant at $p < 0.002$. This means that there is a significant difference between at least two of the groups. Therefore, a Tukey Honestly Significantly Different (HSD) Post Hoc test was needed. The results of the Tukey HSD determined that group two (7 – 12 years teaching experience) was significant with a p value of less than 0.05. It also determined that group two had a mean value of 2.82 which is significantly lower than any of the other groups. Group one had a mean value of 3.55, group three had a mean value of 3.66 and group four had a mean value of 3.68 (Table 5). The findings of the ANOVA that compared "agecat" to "attitude" were shown to be statistically insignificant at $p = 0.35$ (Table 6).

Table 5

ANOVA Years Exper/Attitude

Descriptives					95% Confidence Interval for mean			
	N	Mean	Std. Dev.	Std. Error	Lower Bound	Upper Bound	Minimum	Max
1	8	3.55	0.3162	0.1118	3.2856	3.8144	2.90	3.80
2	4	2.825	0.4573	0.2287	2.0973	3.5527	2.20	3.30
3	5	3.66	0.2302	0.1030	3.3741	3.9459	3.40	4.00
4	5	3.68	0.2378	0.2378	3.3836	3.9764	3.40	4.00
Tot	22	3.4727	0.4300	9.169E-02	3.2821	3.6634	2.20	4.00

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.116	3	0.705	7.183	0.002
Within Groups	1.767	18	9.819E-02		
Total	3.884	21			

Table 6

ANOVA Years Exper/Attitude

Descriptives					95% Confidence Interval for mean			
	N	Mean	Std. Dev.	Std. Error	Lower Bound	Upper Bound	Minimum	Max
1	8	3.4750	0.3919	0.1386	3.1474	3.8026	2.90	3.80
2	6	3.3833	0.2714	0.1108	3.0985	3.6682	2.90	3.70
3	4	3.2750	0.7632	0.3816	2.0606	4.4894	2.20	4.00
4	4	3.8000	0.1414	7.071E-02	3.5750	4.0250	3.70	4.00
Tot	22	3.4727	0.4300	9.169E-02	3.2821	3.6634	2.20	4.00

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.633	3	0.211	1.168	0.349
Within Groups	3.251	18	0.181		
Total	3.884	21			

Finally, a multiple regression was computed using "attitude" as the dependent variable and "gender," "age," "yearsexp" and "class" as independent variables. The regression reported no significance at $p = 0.802$ (Table 7).

Conclusion

The purpose of this study was primarily to determine if the questionnaire used was reliable, then test to see if any of the research questions showed any statistical significance. In regard to the research questions, conducting a study which uses only 22 subjects cannot be determined a representative sample and in no way will these results be considered representative.

The 20 response questionnaire was given to two separate groups of educators. Twenty-two completed surveys were returned. The first step in the analysis was to test the reliability of the 10 educators' attitudes' questions. Based on the results obtained, an alpha = 0.80 (Table 1), the educator attitude portion of the questionnaire was deemed reliable.

Next, the descriptive statistics were calculated for the entire questionnaire. These can be reviewed in table 2. Based on these means, it was noticed that the question, which was written to determine the number of years of relative computer experience each educator had within certain ranges, was answered by everyone who completed the study with a "four," which was "2 + years." Therefore, it is suggested that in the future these ranges be changed and possibly begin with the "2 + years." The statistical analyses for these were still run, but the results were not reported.

The following is a breakdown of the five research questions and the results obtained in this study. The first question asks if educators' attitudes toward the

Table 7

Multiple Regression Gender/Age/Years Exper/Classification

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.338	4	8.456E-02	0.405	**0.802**
Residual	3.545	17	0.209		
Total	3.884	21			

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Err.	Beta	t	Sig.
Gender	-0.143	0.799	-0.167	-0.709	0.488
Age	8.548E-03	0.016	0.207	0.547	0.592
Yearsexp	-1.928E-04	0.022	-0.003	-0.009	0.993
Classification	0.215	0.359	0.147	0.599	0.557

integration of computer software into the classroom is significantly affected by age. As reported in table 6, the findings of the ANOVA that compared the age of educators and their attitudes found no significance at $p < 0.35$. Therefore, there was no need to compute a Tukey HSD test.

Second, are educators' attitudes toward the integration of computer software into the classroom significantly affected by their years of teaching experience? As reported in table 5, the ANOVA comparing years of experience (yrsexcat) to attitude reported a significance level at $p < 0.002$ between at least two of the four "yrsexcat" groups. Therefore, a Tukey HSD Post Hoc test was run to determine which group or groups were significant. Based on the Tukey test, group two (7-12 years teaching experience) was found to be significant at $p < 0.05$. This means that teachers with seven to 12 years of teaching experience appear to have a much lower attitude toward the integration of computer software into the classroom.

Third, are educators' attitudes toward the integration of computer software into the classroom significantly affected by their gender? As seen in table 3, the results of the t-test found that was no significance at 0.35. This is a result of the two means of the variables being similar at 3.50 for males and 3.40 for females. However, the means of these two groups do inform us that there are similarities between male and female attitudes.

Fourth, are educators' attitudes toward the integration of computer software into the classroom significantly affected by years of relative computer experience? Based on the error in the questionnaire, these statistics will not be reported.

Fifth, are teachers' and principals' attitudes toward the integration of computer software into the classroom significantly affected by the other's attitudes? As reported in table 4, after running a t-test to compare the attitudes of teachers and administrators, no significance was found at $p < 0.381$. The Levene's test for equality of variance found that there were not equal variances between the two groups, thus equal variance was not assumed.

Finally, a multiple regression was run comparing all of the variables in the study. There was no statistical significance found between any of the variables at $p = 0.802$ (Table 7).

The main purpose of this study was accomplished. The 10 attitude questions on the questionnaire were deemed internally consistent and reliable, thus worthy of use in future research. A significance did arise between attitude and years of teaching experience, but as stated early in this study it is not considered to be a representative sample of educators. A much larger sample must be tested to determine whether or not there is true significance with any of the research questions.

APPENDIX

EDUCATORS' ATTITUDES TOWARD THE INTEGRATION OF COMPUTER SOFTWARE INTO THE CLASSROOM QUESTIONNAIRE

Below is a list of questions. Please circle or fill in the correct response that relates to you as an educator at the present time.

General Information

1. Classification: **Classroom Teacher** **Administrator**
2. Gender: **Male** **Female**
3. Age: _____
4. Total years experience in education _____

General Questions

5. I feel comfortable/confident using a computer. **YES** **NO**
6. I have a computer at my home. **YES** **NO**
7. I have Internet access at my home. **YES** **NO**
8. Computers are easily accessible at my school. **YES** **NO**
9. I have a computer in my classroom/office. **YES** **NO**
10. Years of relative computer experience.
    6 mos. or less **6mos – 1 yr.** **1-2 years** **2 + years**

Educator Attitude Questions

Please check the appropriate response for the following 10 questions.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
11. I feel that I am a competent computer program user.				
12. I feel that there is a definite need for computer software in the classroom.				
13. I feel confident using different computer programs.				
14. When there is a problem with a computer program that I can't solve I will stick with it until I had it solved.				
15. I think it is important for me to learn to use different computer software.				
16. It seems as if everyone else but me knows what they are doing when it comes to using computer programs.				
17. I avoid using computer programs as much as possible.				
18. I do not feel intimidated by a computer program.				
19. The challenge of learning about new technological ways of assessing students is exciting to me.				
20. My training on different computer software is adequate.				