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How Teacher Attitudes and Administrator Behaviors Affect Levels of Technology Integration In the Classroom

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HOW TEACHER ATTITUDES AND ADMINISTRATOR BEHAVIORS AFFECT LEVELS OF TECHNOLOGY INTEGRATION IN THE CLASSROOM

by

Sheri Leigh Bradshaw Hardin

Abstract of a Dissertation
Submitted to the Graduate Studies Office
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in Partial Fulfillment of the Requirements
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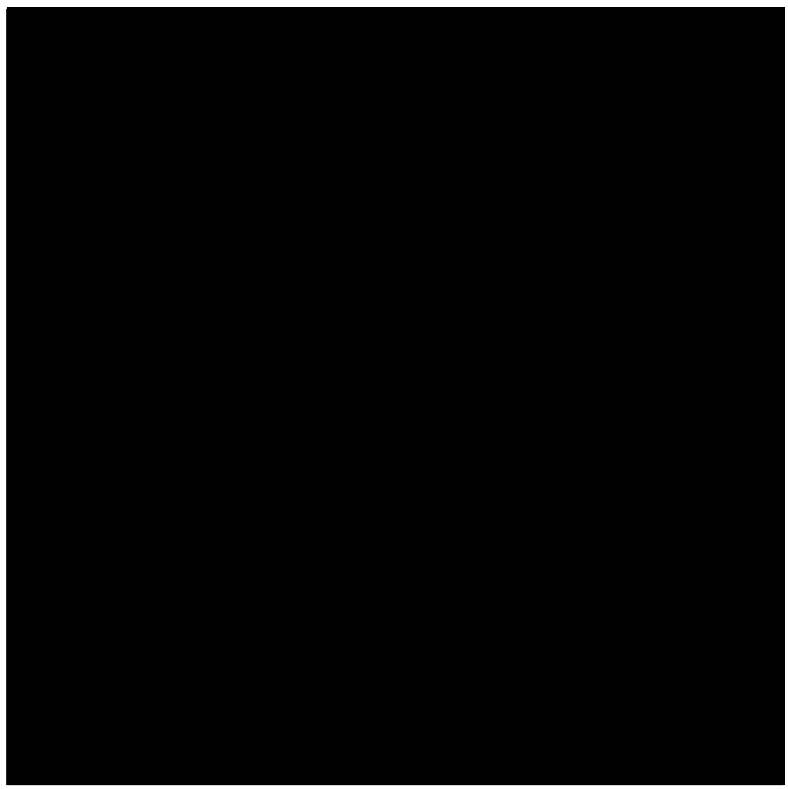

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ABSTRACT

HOW TEACHER ATTITUDES AND ADMINISTRATOR BEHAVIORS AFFECT LEVELS OF TECHNOLOGY INTEGRATION IN THE CLASSROOM

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Multiple linear regression analysis was conducted to evaluate how well teachers' *attitudes* predict levels of *technology integration* into the classroom. This study also investigated whether perceived *support* from the administrator as the instructional leader was related to teachers' levels of *technology integration* into the classroom. The population for this study included identified school districts in rural North Georgia. Utilizing the National Center for Education Statistics (NCES) for the 2002-2003 school year, the researcher identified 5 peer districts: Franklin County, Gilmer County, Stephens County, Union County, and White County. All middle and high school teachers within a district were invited to participate in the study. As a result, a total of 642 certified teachers were invited to participate in the study. Two hundred seventy-six of the 642 questionnaires were returned. Interviews with principals were also conducted to determine whether their reported behaviors supported technology integration into the classroom. A total of 11 principals were invited to participate in the interview process, but only nine principals chose to participate in this process.

The *Perceptions of Computers & Technology* instrument was used to collect data from teachers. Based on the data analyses, the results of the multiple linear regression were statistically significant. Analysis of interview data

indicated that principals viewed technology mostly as a support or supplemental tool. Most of the participating principals also viewed their role in technology integration as a provider of technology funds.

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CHAPTER I

INTRODUCTION

The evolution of technology has created a technology explosion affecting many facets of life enabling, for example, individuals to shop, actively participate in the community, participate in learning communities about any subject, and communicate with anyone anywhere (Burgstahler, 2002). Technology began to have a significant impact on society with the advent of the personal computer in 1975 (Encarta, 2005). Eventually, the applications of technology began to significantly impact the educational arena. According to the U.S. Department of Education (2003), 35 percent of public schools in the United States had access to the Internet in 1994. Conversely, in 2002, 99 percent of public schools in the United States had access to the Internet. In instructional classrooms, Internet access increased from 3 percent in 1994 to 77 percent in 2000 to 92 percent in 2002. Internet access in instructional classrooms is more present in rural areas with 93 percent compared to city schools with 88 percent.

From 1998 to 2002, public schools in the United States also witnessed an increase in the student per instructional computer with Internet access. When the ratio of students to instructional computers with Internet access was first measured in 1998, the ratio was 12.1 to 1. However, in 2002, the ratio improved to 4.8 to 1 (U.S. Department of Education, 2003). The data collected by the National Center for Educational Statistics (NCES) also revealed that schools were focusing on technology professional development. During the 12- month period prior to the fall 2002 NCES survey, 87 percent of public schools indicated

that their teachers had been provided with professional development pertaining to integration of the Internet in the curriculum (U.S. Department of Education, 2003).

Even so, to ensure the integration of technology into education, national and state standards were adopted. In January of 2002, President George W. Bush signed the No Child Left Behind Act of 2001 (NCLB). Title II, Part D of NCLB, also known as the Enhancing Education Through Technology Act of 2001 states, "The primary goal of this part is to improve student academic achievement through the use of technology in elementary and secondary schools" (§ 2402).

To assist in technology funding, NCLB included a component of how states could apply for technology grants. According to NCLB standards, applications for these grants must include "... long-term strategies for improving student academic achievement, including technology literacy, through the effective use of technology in classrooms throughout the State, including through the capacity of teachers to integrate technology effectively into curricula instruction" (Enhancing Education Through Technology Act, 2001, § 2413). Once the funds reach the state agencies, local schools apply to these agencies in order to receive technology funds. The local schools complete applications similar to the state applications, including long-term strategies for technology integration with regard to student achievement.

Even though technology standards existed prior to the Enhancing Education Through Technology Act of 2001, state and local technology

standards became even more important after the signing of NCLB in 2002. In order to meet the requirements of NCLB, many states such as Georgia began aligning their technology standards to those established by the International Society of Technology in Education (ISTE) (Instructional Technology, n.d.). By 2000, ISTE had published the National Educational Technology Standards (NETS) for students and teachers. The alignment of Georgia's standards and benchmarks to the NETS for students and teachers included areas such as addressing basic technology skills, utilization of technology communication tools, and the utilization of technology in problem-solving and decision-making (ISTE NETS, 2005; Georgia Department of Education, 2005).

Along with aligning Georgia technology standards to the NETS, educators must meet "highly qualified" criteria by the 2005-2006 school year. According to NCLB, a highly qualified educator is one who "has a bachelor's degree, full state certification or licensure, and [can] prove that they know each subject they teach" (U.S. Department of Education, 2005). In Georgia, this qualification includes teachers being certified in the area they teach and also being InTech certified, having certification demonstrating satisfactory computer skill competency. As stated in §505-2-.20 of Georgia's certification requirements effective July 15, 2005, "Certificates expiring on June 30, 2006 or later shall NOT be renewed for a 5-year period unless the certificate holder demonstrates satisfactory proficiency on a PSC-approved test of computer skill competency or completes a PSC-approved course" (Georgia Professional Standards Commission, 2006). To become InTech certified, educators must participate in a 50-hour professional

development program. As stated by the Georgia Technology Training Centers (2000), the curriculum of this program pertains to the use of "modern technologies, curriculum integration, designs for learning, enhanced pedagogy, and classroom management" (p. 19).

With regard to highly qualified and technology trained educators, school districts and legislators are placing an emphasis on technology integration across the school curriculum because of the focus on student achievement. Although very few studies have been conducted to determine whether technology does in fact affect achievement, some believe there is a positive relationship between the two. Waxman, Lin, and Michko (2003) found that, although modest, technology integration into teaching and learning environments does have a positive effect on student outcomes when compared to traditional instruction.

However, the impact of technology integration into the classroom may affect more than student scores. Preparation in schools with regard to technology may also influence the student's preparation for post-school careers and activities. According to the United States Bureau of Labor Statistics (2003), the third major occupation group in the United States pertained to computers and mathematics, employing 2,827,010 personnel in 2002. However, the top two occupational groups during the same year were management and business, and financial operations that also incorporated the use of technology. These groups employed an additional 6,653,480 and 4,924,210 employees respectively. Although the total number of employees for the top three occupational groups

was over 14 million, an analysis of the other occupational groups revealed that technology was also a key component of other occupations as well.

To determine the role of technology in classrooms with regard to classroom instruction, the present investigation addressed teachers' attitudes toward technology and their levels of technology integration into the classroom and whether perceived support from the principal, as the instructional leader, is related to teachers' levels of technology integration into the classroom. During the time of this study, most novice and veteran teachers received technology training as a requirement for the successful completion of their teacher certification degree programs or through InTech. With regard to the InTech program, the objectives of the program pertained to teaching educators how to utilize and incorporate various technology hardware and software in a productive manner in order to enhance the learning environment.

Problem Statement

As technology grows and evolves, its role in society becomes more prominent. The significant role of technology in areas such as education, banking, and shopping requires individuals to possess a certain level of technology literacy and competency. The preponderance of this responsibility of promoting technology literacy and competency resides with the nation's educational systems. With NCLB, NETS, and state technology standards and teacher certification, teachers and students must demonstrate a certain level of computer competency (Enhancing Education Through Technology Act, 2001, § 2413; Georgia Department of Education, 2005; Georgia Professional Standards

Commission, 2005; ISTE NETS, 2005). While there is a body of literature that discusses the implementation of instructional strategies into the classroom by teachers (Daniels & Bizar, 1998; Marzano, 2003; Marzano, Pickering, & Pollock, 2001) and the role of administrators as instructional leaders (Rebore, 2004; Snowden & Gorton, 1998; Zepeda, 2003), there is little research that discusses the relationship between teachers' attitudes, teachers' levels of technology integration, and perceived administrative support. These factors are important to technology integration because, according to Scott and Hannafin (2000), deciding technology's role in education is crucial for all educational stakeholders if the intention is to improve teaching and learning.

The premise of this study was to gather data to investigate whether teachers' attitudes toward technology were related to their levels of technology integration into the classroom. This study also investigated whether perceived support from the administrator as the instructional leader was related to teachers' levels of technology integration into the classroom.

To determine whether attitudes do affect technology integration, the following questions provided the basis of the study:

1. How accurately can *attitude toward technology use* in the classroom, *confidence and comfort with technology*, *instructional strategies that incorporate technology*, and *perceived support from administration* predict teachers' levels of *technology integration* into the classroom?
2. How accurately can *attitude toward technology use* alone in the classroom predict teachers' levels of *technology integration* into the classroom?

3. How accurately can *confidence and comfort with technology* alone predict teachers' levels of *technology integration* into the classroom?
4. How accurately can *instructional strategies that incorporate technology* alone predict teachers' levels of *technology integration* into the classroom?
5. How accurately can *perceived support from administration* alone predict teachers' levels of *technology integration* into the classroom?

Purpose of Study

For the purpose of this study, technology integration refers to the use of technology for teacher-centered and student-centered instruction. The integration of technology should enhance lessons and address state requirements and standards. The purpose of this study was to determine whether teachers' attitudes toward technology were related to their levels of technology integration into the classroom. In addition, this study also determined whether perceived support from the administrator as the instructional leader was related to teachers' levels of technology integration.

Utilizing the National Center for Education Statistics (NCES) for the 2003-2004 school year, five peer districts were identified. Selection of participatory districts began with the district where the researcher was employed. Because of the small number of teachers in the targeted schools in each district, all teachers within a district were invited to participate in the study. *The Perceptions of Computers & Technology* instrument (see Appendix A) was utilized in this study, and a multiple linear regression was used to test the hypotheses of the study.

With the data collected from this correlational study, school districts will have access to information on teachers' attitudes toward technology and their levels of technology integration into the classroom. Also, data collected from this study can demonstrate whether perceived support from administrators is related to teachers' levels of technology integration into the classroom. With this data, school districts can make informed decisions with regard to technology professional development, technology support, technology acquisitions, and administrative training. The results of this study can highlight the technology professional development needs of teachers and the technology professional development needs of administrators.

Hypotheses

Based on previous studies (Dupagne & Krendl, 1992; Ertmer, Addison, Lane, Ross, & Woods, 1999; Hogarty, Lang, & Kromrey, 2003; Thomas & Knezek, 2002), this study was guided by the following directional hypotheses:

H_1: There is a statistically significant relationship in teachers' levels of *technology integration* with respect to *attitude toward technology use in the classroom*, *confidence and comfort with technology*, *instructional strategies incorporating technology*, and perceived *administrative support* with regard to technology utilization.

H_2: There is a statistically significant relationship in teachers' levels of *technology integration* with respect to *attitude toward technology use* in the classroom.

H_3: There is a statistically significant relationship in teachers' levels of *technology integration* with respect to *confidence and comfort with technology*.

H_4: There is a statistically significant relationship in teachers' levels of *technology integration* with respect to *instructional strategies* incorporating technology.

H_5: There is a statistically significant relationship in teachers' levels of *technology integration* with respect to *perceived administrative support* with regard to technology utilization.

Delimitations

This study was delimited as follows:

1. The participants were delimited to middle and high school teachers employed in the selected school districts in rural North Georgia.
2. The variables were delimited to *attitude* toward technology use in the classroom, *confidence* and *comfort* with technology, *instructional strategies* incorporating technology, and *administrative support* with regard to technology utilization as measured by *Perceptions of Computers & Technology* (Hogarty, Lang, & Kromrey, 2003).

Definition of Terms

The following definitions are provided:

Administrative Support – For the purposes of this study, administrative support will refer to the resources and training provided by the building level principal in order to facilitate the integration of technology into classrooms.

Attitude—Predisposition to act in a positive or negative manner based on personal beliefs (Ryan & Cooper, 1998). For the purposes of this study, attitude will be defined as measured by the *Perceptions of Computers & Technology* instrument.

Comfort – For the purpose of this study, comfort will refer to the teachers' ability to integrate technology into the classroom with ease and confidence.

Confidence – For the purpose of this study, confidence will refer to the teacher's belief that he/she utilizes or can utilize technology in an effective, efficient, and relevant manner.

Constructivist Learning Theory – A philosophical orientation that posits students are not passive learners. Instead, they are active participants in the learning process. Prior knowledge is the foundation for future learning. Students' prior knowledge can act as a bridge or barrier to new learning (Sewell, 2002).

Instructional Leader – Key individual who defines, models, and supports recommended methods of instruction in the school setting (Lunenburg & Ornstein, 2000).

Instructional Strategies – For the purpose of this study, instructional strategies will refer to the methods of delivering academic information to students.

Instructional Technology – Tools other than the teacher, chalkboard, or textbook that are used to present and enhance instruction (Reiser & Dempsey, 2002). For the purposes of this study, instructional technology will refer to computers, Internet, computer programs, computer software, and computer accessories such as interactive whiteboards and computer projectors.

Integrate Technology (InTech) – Georgia technology program that focuses on basic computer skills that are aligned to Georgia's Quality Core Curriculum (Georgia Educational Technology Training Centers, 2000).

Intech Certification – Documentation of "satisfactory proficiency on a test of computer skill competency" (Georgia Professional Standards Commission, 2006).

Novice Teacher – Teacher who does not deviate from lesson plans due to lack of skills and self-confidence that stem from the lack of experience (Pellicer & Anderson, 1995). For the purposes of this study, a novice teacher will refer to someone who has less than three years teaching experience.

Peer Districts – Districts that share similar characteristics with relation to total students, student/teacher ratio, percent of children in poverty, district type, and locale code (National Center for Education Statistics, 2002).

Student-Centered Instruction – Method of teaching that "... provide[s] appropriate opportunities for students to practice or extend previous content or to generate new content" (Georgia Department of Education, 2004, p. 36).

Teacher-Centered Instruction – Teacher introduces and develops content via definitions, examples, demonstrations, and modeling (Georgia Department of Education, 2004).

Technology (High Technology) – For the purposes of this study, technology or high technology will refer to computers, computer software, Internet, interactive whiteboard, digital cameras, and computer accessories such as interactive slates, computer projectors, CD-ROM, and DVD.

Technology Integration – "Facilitate technology-enhanced experiences that address content standards and student technology standards" (Georgia Educational Technology Training Centers, 2000, p. 10).

Experienced Teacher – For the purpose of this study, an experienced teacher will refer to someone who has four or more years of teaching experience.

Justification

In the state of Georgia, legislators passed the "A Plus Education Reform Act of 2000." According to this bill, states should place a greater emphasis on aligning the professional development needs of teachers to student achievement (HB 1187, 2000). This bill along with the regulations of NCLB requires the state of Georgia to ensure professional development that addresses student achievement and the integration of technology into the curriculum in order to affect student achievement (HB 1187, 2000; Enhancing Education Through Technology Act, 2001, §2402). With technology, learning environments can be constructed to be more hands-on, and active involvement of students in the learning process increases the probability that students will learn (Pellicer & Anderson, 1995).

However, barriers to technology integration can determine whether school districts are able to address the requirements and regulations of these two pieces of legislature. Barriers such as teachers' attitudes/beliefs, teachers' personalities, and administrators' practices may prevent the effective integration of technology into the curriculum. Some teachers may not utilize technology in their classrooms because they do not believe its incorporation positively affects student achievement (Leh, 2000). Other teachers may ignore technology as an instructional tool because they do not feel comfortable with utilizing this medium (Chambers, Hardy, Smith, & Sienty, 2003). Many teachers may not integrate

technology into the curriculum because the lack of support and leadership from administrators (Anderson & Dexter, 2005).

Previous studies indicated proper integration of technology into the school curriculum will not be accomplished without support from school administrators (Anderson & Dexter, 2005, Baylor & Ritchie, 2002; Dawson & Rakes, 2003). Blasé and Blasé (2000) found that modeling of best practices with faculty and students affects teachers' perceptions with regard to effective instructional leadership. Barnett (2001) posited, "The lack of leadership is the single biggest barrier to the use of technology" (p. 4). However, Dawson and Rakes (2003) also indicated that one exposition for the lack of technology support from administrators resides in the fact that administrators do not receive proper technology training in order to be technology leaders.

Studies pertaining to teachers and technology integration indicated barriers to technology integration were based upon teachers' beliefs and concerns with regard to classroom practice and technology perceptions (Ertmer, Addison, Lane, Ross, & Woods, 1999; Mills, 1999). Other factors influencing technology integration into the classroom were technology leadership and professional development (Baylor & Ritchie, 2002). Fisher and Dove (1999) proposed that administrators must provide support and address concerns with regard to technology in order to promote technology integration into classrooms.

In order to accomplish the task of integrating technology, school districts must be aware of the barriers that may affect technology integration such as an inadequate number of computers for students or insufficient instructional time to

integrate technology (Greshner, Snider, Huestis, & Foster, 2000; Smerdon, Cronen, Lanahan, Anderson, Iannotti, & Angeles). As previously stated, the results of this study can highlight the technology professional development needs of teachers and administrators. Professional development courses can be constructed that are effective, individualized, and beneficial for teaching teachers and administrators the proper techniques of technology integration (Iding, Crosby, & Speitel, 2002; Kanaya, Light, & Culp, 2005; Mills & Tincher, 2003). The present study extended the works of the previously mentioned researchers by focusing on *technology integration*, teacher *attitudes* toward technology, and perceived *administrative support* in rural middle and high schools in North Georgia.

Summary

The influence of technology is rapidly expanding into many areas affecting not only educational opportunities, but also employment opportunities. Because technology is now playing a significant role in every facet of life, federal and state entities have developed technology educational standards for both teachers and students. With regard to teachers, these technology standards determine qualification for teacher certification. Even so, some teachers do not integrate technology into the classroom because they do not feel comfortable or they lack administrative support. Because educational systems have the responsibility of adhering to federal and state guidelines with regard to technology such as NCLB along with the responsibility of preparing students for postsecondary choices, this study analyzed factors that may affect technology integration into the classroom.

Chapter Two contains a review of the literature pertaining to technology integration. Chapter Three explains the methodology that was utilized to conduct this study. In Chapter Four, the results of this study are presented. Chapter Five contains a discussion pertaining to the results of this study along with recommendations for future research.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

In the mid-1800s, the concept of the Common School was established. The curriculum of this type of school guided teachers in emphasizing basic skills, moral education, and citizenship (Ryan & Cooper, 1998). However, in 2006, the instructional method of differentiating instruction was introduced to teachers as a viable way to affect student performance in a positive manner by addressing each student's needs in the classroom (McBride, 2004). With the focus on new instructional methods in order to promote student success in the classroom and on standardized tests, principals have now taken on a new role in classrooms; providing teachers with the skills and support needed to ensure student success (Zepeda, 2003)

Likewise, the concept of instructional technology has evolved. In the 1800s and 1900s, instructional technology referred to chalkboards, filmstrip projectors, and the overhead projector (Ryan & Cooper, 1998). By the 21st century, instructional technology was viewed as the use of computers as instructional tools. Reiser and Dempsey (2002) described instructional technology as tools other than the teacher, chalkboard, or textbook that are used to present and enhance instruction. Even so, some educators may consider this definition of instructional technology to be too general.

When considering technology, educators should determine what this definition encompasses. With regard to technology integration into education,

high technology is the term that best describes the technology age and digital classrooms of the 21st century. For the purposes of this study, *technology* or *high technology* will refer to computers, computer software, Internet, interactive whiteboard, digital cameras, and computer accessories such as interactive slates, computer projectors, CD-ROM, and DVD.

Evolution of Technology

Eventually, every "innovation" is replaced by new technology. Scrolls were replaced by textbooks, the slate was replaced by the ball point pen, and the abacus was replaced by the handheld calculator. In time, the highly advanced interactive boards utilized in the 21st century will be replaced by new technologies that have capabilities of further enhancing the learning environment, "We have yet to see a limit to the uses of these ubiquitous tools" (Burgstahler, 2002, p. 2). This has been true of all instructional tools that have been incorporated into the classroom. However, instructional tools have not been the only entities to evolve. Along with advancements in instructional tools, instructional styles have adapted and evolved as well.

During the 16th and 17th centuries, a major technological revolution in education began. In the 16th century, the possibility of mass-producing books became a reality. Owning books became a reality for many for the first time due to increased availability and decreased prices (Beck, Black, Krieger, Naylor, & Shabaka, 1999). School supplies during the 16th and 17th centuries consisted mostly of goose-quill pens, homemade ink, and birch bark for paper (U.S. Department of Health, Education, and Welfare, 1961).

In the 19th century, another technological apparatus was invented—the chalkboard. Because these apparatuses were used ineffectively or not at all, professional development manuals were developed to encourage use and instruct teachers as to how to incorporate the chalkboard into their lessons (Ryan & Cooper, 1998). Conversely, in 2005, chalkboards or whiteboards are common instructional tools in classrooms. Other instructional tools introduced into the classroom during this time period included steel pens, slates, and maps (U.S. Department of Health, Education, and Welfare, 1961).

Although the advancement of technology seemed to be a slow process in the previous centuries, in the 20th century, schools witnessed the advent of many devices that could enhance instruction. Many of these devices, such as the stereopticon, filmstrip projector, overhead projector, opaque projector, educational television, and microcomputers, allowed teachers to integrate visuals into their lessons (Ryan & Cooper, 1998). With these technologies, students had visuals to reinforce instruction, and with the microcomputer, students now had a hands-on tool where they could manipulate data.

By the 21st century, the impact of technology is evident in the trends established by technologically advanced schools. Educational uses of various technology tools include streaming audio, streaming video, audio chat, web whiteboarding, instant messaging, and hand-held and wireless technologies; each having capabilities of enhancing classroom instruction (McGreal & Elliott, n.d.). Students with learning disabilities benefit from assistive technologies that, for example, provide reading support (Hasselbring & Bausch, 2005). These

assistive technologies are also beneficial for schools in rural areas that are limited in providing supportive services to disabled students (Belcastro, 2004). Technologies such as the Internet, email, World Wide Web, and interactive television are utilized to bridge the gap between teacher instruction and parental interaction creating an information link, coaching link, feedback link, and instructional link (Marshall & Rossett, n. d.). This ideology is supported by Nixon (2002) who posited that parents who are knowledgeable and utilize technology are important key players in student achievement and school programs.

Another trend of the technologically advanced schools of the 21st century is the incorporation of videoconferencing in order to enhance school experiences. With videoconferencing school districts are able to provide additional educational opportunities to students. An example of the availability of videoconferencing can be evidenced in the state of Georgia. The G-Span network in Georgia connects approximately 400 videoconferencing facilities (Van Horn, 1999). Another example of digital networking can be found in South Dakota. In South Dakota, all the schools in the state are connected to a digital network, and students and teachers can converse on subjects such as French or calculus even though they may be 300 miles apart (Johnson, 2001).

Together with secondary institutions, postsecondary institutions are taking advantage of technological advances by offering online degrees. In 1999, Stanford University became the first prestigious university to offer an online graduate degree (Salisbury, 1998). Nova Southeastern University has gained recognition by offering online graduate degrees in various disciplines. In

approximately fourteen months, a student can earn a Master of Arts in Teaching and Learning in a specific area (Education Online Search, 2005), "A total of 1.2 million students are currently enrolled in exclusively online programs, a number that's expected to reach 1.8 million or more by 2007" (Rodgers, 2005, p. 4). According to Caudron (2001), job applicants who have earned their degrees online display characteristics such as discipline and motivation which are crucial to successful job performance.

Other school systems are utilizing technology to incorporate the use of email, newsgroups, and discussion lists. The advantages of utilizing these technology tools include facilitating communication between educational stakeholders, inevitably creating a school and global community (Peat & Fernandez, 2000). Ward (1997) posited that technology tools such as listservs allow school leaders to become members of learning communities that are aware of the ever-changing nature of education.

Importance of Technology

Student Involvement

According to Pellicer and Anderson (1995), the more the student is involved in the learning process, the more likely learning will occur. Sewell (2002) stated, "In other words, students are active learners who construct their own knowledge; they are not passive recipients of new information, somewhat like a sponge" (p. 24). The development of complex learning environments allows individuals to pursue learning goals via understanding, questioning, and assessment (Reiser & Dempsey, 2002). Crawford, Bodine, and Hoglund (1993)

believed technology is relevant in the educational arena because it is relevant in society. Therefore, school districts should be preparing individuals for their roles in society via technology integration.

In order to ensure complex learning, teachers must move away from lecturing to more hands-on, technologically driven lessons (Maurer & Davidson, 1999). This belief is held by researchers and some teachers. Fiske (1991) reported how a group of Fairdale teachers agreed to follow a typical student's schedule. By the end of the school day, the teachers were frustrated because they were not involved in the learning process. Fiske (1991) went on to suggest that technology integration could remedy the issue of student boredom in the classroom by providing a technological medium to serve as "brain amplifiers" (p. 158). Other influences of technology on student involvement include providing teachers with time to interact one-on-one with students, evaluate student progress, and expand educational opportunities (Gough, 1997).

Technology and Student Achievement

Existing studies are mixed with regard to technology's effects on student achievement because technology's effectiveness depends on the expertise of the teacher and/or administrator (Reynolds, 2004). As a result, very few studies have been conducted to determine technology's impact on student achievement, many pending available grant money. In 2003, the U.S. Department of Education stated in a press release nine states would share $15 million in grant money to study the impact of technology on student achievement. These studies will be conducted over a three year span (Aspey, 2003).

Waxman, Lin, and Michko (2003) conducted a meta-analysis of published research from 1997-2003 to evaluate the effectiveness of teaching and learning with technology upon student outcomes. The findings of this study indicated that, although the effect is small, technology may have a greater impact on student outcomes than what was initially thought. The 2000 research report on the effectiveness of technology in schools that was conducted by the Software & Information Industry Association stated that educational technology has had a profound impact on student achievement in all major subject areas from preschool to higher education and with regular education and special needs students (Sivin-Kachala & Bialo, 2000).

In their study, Dalton and Hannafin (1988) studied 117 eighth grade math students to determine the effects of instructional strategies designed to promote computation mastery. The researchers posited both traditional instruction and computer-based instruction have value. However, their values increase when they are used to compliment each other. McDonald and Hannafin (2003) conducted a study with third graders in the same school in Virginia. One class received instruction via Web-based review whereas the other third grade class reviewed via traditional instruction. The researchers proposed that Web-based computer games would help third grade students score higher on a social studies assessment than students reviewed in a traditional manner. Although this hypothesis was disproved, other benefits of Web-based computer games were revealed including increased discussions, increased interest, and more time spent on the subjects.

According to Cradler (n. d.), technology can affect student outcomes if aligned to education standards. This perception is also supported by the study conducted by Sherry, Billig, Jesse, and Watson-Acosta (2001). In their study, language arts students and teachers in Vermont participated in a virtual community. Findings of this study indicated that teachers should focus on students' metacognitive skills, application of skills, and inquiry learning as technology is integrated instead of focusing solely on the integration of technology. These skills are essential components of educational standards in all states. In a previous study, Wenglinsky (1998) analyzed data from the 1996 National Assessment of Educational Progress in mathematics. This study consisted of 6,227 fourth graders and 7,146 eighth grades. Wenglinsky also determined that technology can have an impact on student achievement in mathematics. However, the impact depends on how the technology is used.

Conversely, other studies indicated technology does not have an affect on student achievement. In the study conducted by Cramer and Smith (2002), beginning and end of the year writing samples of middle school students along with interview data of language arts teachers were evaluated. The study was conducted during the 1999-2000 school year in two matched schools in the same district. Researchers did not find that technology had a significant influence with regard to student writing scores in areas of ideas, organization, and/or voice when compared to a traditional school. However, it is important to note that in this study the traditional school utilized technology more often than the comparative school.

Technology's Role in Society

Initially, services for telephones, gas, and banking required little more than the ability to communicate with another individual. By the year 2005, these services in addition to others became automated in nature, "Routines like arranging a theater ticket or an airline reservation have become high-tech enterprises that routinely juggle a myriad of complexities on behalf of customers" (Salomon & Perkins, 1996).

According to the United States Department of Commerce (2003), "U.S. retail e-commerce sales (e-sales) reached $56 billion in 2003, an increase of twenty-five percent over revised 2002 e-sales of $45 billion" (p. 4). Third quarter retail e-commerce sales for 2005 was $22.3 billion (U.S. Census Bureau, 2006). With online auction services such as EBay and other retail Websites such as Amazon.com, Walmart.com, and Target.com, many people have become dependent on technology for purchasing goods and services. Along with Internet shopping, some business transactions can only occur via automated systems or the Internet. As stated by Saidam (n. d.), "Our lives, our media, our entertainment, and our education are now dependent or about to establish dependence on technology" (p. 3).

In addition the need for technology skills in order to function optimally in society, individuals must also have technology skills for most occupations. Basic technology skills are needed for most entry level positions, and businesses want to hire trained people instead of providing training (Zimmerman, 2001).

Businesses benefit from technology via creation of new jobs, increase in production, and a decrease in cost (Bernard, n. d.).

With regard to occupational opportunities, Kerka (1994) stated, "Many jobs depend on the skills of symbolic analysis – abstraction, system thinking, experimental inquiry, and collaboration. Acquiring these skills requires an interdisciplinary foundation of science, humanities, AND technology" (¶ 7). Kerka's assertions are supported by employment statistics. As noted in Chapter I, top employment fields in 2002 depended on technology. Management and business along with financial operations employed 6,653,480 and 4,924,210 employees respectively. Computers and mathematics employed 2,827,010 employees.

Technology's role in society is significant to this particular study because of the responsibilities that teachers and educational systems must uphold. "As the world becomes more dependent on technology, students and their parents will continue to expect a public education to include the integration of computers and the Internet (Slowinski, 2000, p. 2). Based on the literature in the previous sections, preparation for an active role in society includes being technology literate. Even so, teachers may not be receptive to this shift in instructional priorities and methods. According to Mellencamp (1992), receptivity to change may be dependent on readiness, support, voice, meaningfulness, and efficacy, but is also dependent on personal attitude. Therefore, it is important for school systems to understand deterrents that could impede teachers from fulfilling educational responsibilities. According to Slowinski (2000), "... administrators

who implement technology effectively in their schools and communities will contribute greatly to both education and the economy in the twenty-first century" (p. 2).

Factors Affecting Technology Integration

Various factors may affect technology integration into classrooms including not enough computers or not utilizing computers for delivering instruction (Smerdon, Cronen, Lanahan, Anderson, Iannotti, & Angeles, 2000; Mills & Tincher, 2003). In the study conducted by Smerdon et al. (2000), 78 percent of teachers indicated one barrier to technology integration is not enough computers. As noted in the study conducted by Mills and Tincher (2003), Schlechty (1997) espoused some teachers may refuse to utilize technology or utilize technology inefficiently.

Barron, Kemker, Harmes, and Kalaydjian (2003) conducted a study focusing on teachers' instructional modes and technology integration. This study was conducted in a large school district in Florida that employed 2,156 teachers. The response rate for this study was 35 percent. Data from this study indicated that elementary school teachers were more likely to utilize technology in problem-solving or decision-making assignments and communication than high school teachers. There were also differences in technology integration according to subject area with science teachers utilizing technology more than social studies, English, and math teachers. To address issues such as these, Swain and Pearson (2003) suggested that the implementation of technology standards

would provide a proper and adequate education that sets high standards for all children and eliminate the digital divide.

In the study conducted by Marcinkiewicz (1994), 170 elementary teachers were given questionnaires to determine whether personal variables predict computer use. These variables included innovativeness, teacher locus of control, perceived relevance, and self-confidence in the use of computers. Findings of this study indicated infrequent use of computers by teachers even though computers were available. Innovativeness and self-confidence in the use of computers were more closely related to teachers' computer use suggesting a need for individualized technology staff development.

Greshner, Snider, Huestis, and Foster (2000) analyzed preservice teachers, mentor teachers, and university professors at the Texas Woman's University during the Spring 2000 semester. These participants were asked to complete specific measures associated with technology integration. Teachers remarked that technology was not integrated due to insufficient time. Medcalf-Davenport (1998) also evaluated the attitudes, beliefs, and preparation of in-service teachers, pre-service teachers, and student teachers with regard to technology integration. The participants of this study were teachers in four school districts in San Antonio, Texas. The study began in 1992 and data was collected over six years. The results of this study indicated that teachers view the computer as the curriculum instead of viewing it as a tool to teach the curriculum.

Teachers' Attitudes/Beliefs & Personalities

According to Shaunessy (2005), teachers' attitudes toward technology may be dependent on content area or grade level. In the study conducted by Hogarty, Lang, and Kromrey (2003), data suggested a positive relationship between teachers' perceptions of computers and teachers' confidence and comfort with regard to computers and computer applications. Leh (2000) analyzed teachers' comfort levels, beliefs, confidence, and attitude toward technology. Participants of this study were sixty-eight teachers who were taking a technology course at a public university in 1999. Initial findings of this study revealed that the technology computer course did increase students' confidence and comfort levels with regard to computers and computer applications. Although the students thought the training was beneficial, these educators expressed concerns with regard to technology integration into their classrooms because of the lack of computers in the school or the current computers in their schools were inadequate.

Hazzan (2000) evaluated the connection between prospective mathematics high school teachers' attitudes toward technology and how it relates to the low level of computer integration into the classroom. Based on the data collected from 1996-1998, Hazzan observed that new teachers have anxiety because of their roles as teachers are somewhat unfamiliar. Additionally, there is anxiety associated with the role of computers in the classroom because technology may change the familiar persona of the traditional teacher.

McKenzie (2000) investigated the perceptions of teachers' and twelfth grade students with relation to educational technology, student achievement, and improved student learning. Participants of this study were teachers and students who attended three high schools in the same district in Georgia. McKenzie concluded that teachers' perceptions and students' perceptions with regard to technology utilization does improve student learning. Vroom, 1964, espoused "If an object is believed by a person to lead to desired consequences or to prevent undesired consequences, the person is predicted to have a positive attitude toward it" (p. 16). This concept can apply to technology integration into the classroom. If teachers perceive technology integration as advantageous for students, they are more likely to integrate technology more often than teachers who have negative attitudes toward technology, "An expectancy is defined as a momentary belief concerning the likelihood that a particular act will be followed by a particular outcome" (Vroom, 1964, p. 17). Galowich (1999) administered a survey to teachers in five elementary schools in a large school district in southern California. From the data, the researcher suggested that technology is not truly incorporated into instructional strategies. Galowich (1999) explained this finding by suggesting ". . . teacher's use of technology to teach in the classroom is more likely to be higher when his or her attitude (separate from usage) and technology usage outside of work (separate from attitude) are higher" (p. 6).

Ertmer, Addison, Lane, Ross, and Woods (1999) conducted a study with seven K-2 teachers at Midland elementary in order to determine teachers' use of technology and their perceptions regarding how and why they utilize technology.

The researchers collected data via a short survey, classroom observations, and teacher interviews over a six week period. Results indicated that teachers' beliefs pertaining to instructional practices affected how technology is viewed and used.

In a study conducted by Chambers, Hardy, Smith, and Sienty (2003), 200 emergency permit intermediate and secondary teachers enrolled in college courses and under contract with school districts in Northeast Texas were given a questionnaire and the Myers-Briggs Type Inventory to determine whether personalities affect technology. The findings of this study indicated that the personalities of secondary teachers could affect technology integration; intuitive personalities being more comfortable with technology integration than sensory personalities.

Mills (1999) administered a Stages of Concern Questionnaire to four schools in an urban school district that had implemented the integrated learning systems educational software. Results indicated that successful technology integration depended on teachers' approval, acceptance, and implementation. Approval, acceptance, and implementation of technology by teachers may vary according to grade level and subject area. If teachers have a reason to utilize technology, they are more apt to integrate technology (Scoolis, 1999).

Administrators' Practices

Within the scope of integrating technology, effective leaders are a necessary component of effective schools. Maxwell (1999) stated,

> Vision is everything for a leader. It is utterly indispensable. Why? Because vision leads the leader. It paints the target. It sparks and fuels the fire

within, and draws him forward. It is also the fire lighter for others who follow that leader (p. 150).

Thomas and Knezek (2002) proposed that in order for technology to be utilized effectively, administrators must realize that technology can be an effective tool in increasing student achievement. Administrators can either sustain or transform the learning culture of a school (Cosner & Peterson, 2003). To transform a learning culture and promote technology integration, administrators must provide support that includes commitment, leadership, organization, finance, and faculty development (Wizer & McPherson, 2005). According to Corcoran and Wilson (1986), community members such as parents, teachers, and students, believe that the principal is the one who can facilitate and maintain success.

In order to facilitate and maintain success, the administrator must be aware of his/her instructional behaviors. According to the study conducted by Blasé and Blasé (2000), effective principals modeled best practices in teaching in classrooms and during conferences. This finding coincides with Lashway's concept of developing instructional leaders. Lashway (2002) proposed that instructional leaders must model behaviors they expect of their teachers. Administrators who support technology integration and professional development pertaining technology integration are essential in developing a school culture that utilizes and integrates technology (Baylor & Ritchie, 2002; Dupagne & Krendl, 1992).

Also, through training, administrators must understand the positive impact of technology integration into the classroom, and as a result of this understanding, set standards for technology integration (Schmeltzer, 2001). However, according to the study conducted by Dawson and Rakes (2003), one third of the principals who participated in the study were not receiving the training to be instructional leaders with regard to technology integration. Anderson and Dexter (2005) examined data collected from the 1998 Teaching, Learning, and Computing nation-wide survey in which 898 schools participated. From the data, Anderson and Dexter concluded that "a school's technology efforts are seriously threatened unless key administrators become active technology leaders in a school" (p. 74).

Influence of Administrator's Behaviors

According to Collins (2001), leaders of great organizations develop a culture of discipline that endures. In his book, *Good Business*, Csikszentmihalyi (2003) proposed that individuals cannot be forced to give their best. Instead, leaders must provide conditions where they can grow as individuals. With regard to principal-teacher interactions, positive interactions are based primarily on positive relationships. These relationships, in turn, create learning communities (Burmeister, 2004). This belief is also supported by Blasé and Blasé. Based on their research, Blasé and Blasé (2001) posited that effective principal-teacher interactions create learning communities where teachers are open to various instructional methods.

In the study conducted by Ebmeier (2003), full-time K-12 teachers working in a large Midwestern metropolitan area were given surveys to evaluate a supervision model. Surveys were collected from 1993-1998. Results indicated that principals can influence teachers' confidence and respect toward administrators by demonstrating confidence and respect for the instructional process. Additionally, principals' behaviors influence teachers' job satisfaction and work commitment. To facilitate reflection on learning and practice, administrators should provide teachers with suggestions, demonstrations, examples, and personal experiences and model appropriate instructional techniques (Blasé & Blasé, 2000; Blasé & Blasé, 2001).

Gonzales and Short (1996) examined the relationship between principal's use of power and teacher empowerment. Three hundred one teachers from an urban school district in Florida participated in the study. Gonzales and Short found that teachers who are empowered acknowledge the principal's expertise and pivotal role in influencing positive change. Additionally, teacher satisfaction can be affected in a positive manner by administrators who care, listen, and respond to their teachers' concerns. Davis and Wilson (2000) surveyed teachers and principals in public elementary schools in eastern Washington. Based on the data collected in their study, Davis and Wilson posited that principals who empower their teachers develop a school culture where teachers are active participants in instructional decisions. As a result, these teachers believe their effort and work is meaningful.

Professional Development

According to the article written by Tenbusch (1998), when compared with other occupational groups, national statistics have demonstrated that teachers do not receive as much on the job training. Smerdon et al. (2000) reported that in 1999 one third of teachers felt prepared or very well prepared to integrate technology into classrooms. Furthermore, teachers indicated technology preparation occurred via independent practice (93%), professional development (88%), and colleagues (87%). Even so, 67 percent of teachers espoused follow up training was not available. In 1998, the Star Report indicated only 20 percent of full-time public school teachers felt prepared to integrate technology into the classroom (The CEO Forum, 1999). "Teachers, even those who are computer literate, need a vision of technology in the learning process, and that vision needs to expand as learning technology changes" (Collier, 2001).

Effective integration of technology into the classroom in order to increase student achievement requires teachers to have the knowledge to effectively integrate technology and align the integration of technology to curriculum standards (Holland, 2000). In a study conducted by Iding, Crosby, and Speitel (2002), questionnaires were distributed to 78 preservice and practicing teachers who were enrolled in special education courses or science education courses at a university in the Western United States. The purpose of the study was to determine ways to facilitate technology integration for instructional purposes. Results indicated that teachers were interested in learning more about how to integrate technology into the classroom. However, the majority of teachers in this

study were not equipped with expertise to determine which educational software was appropriate for their teaching needs. Also, these teachers were not utilizing technology as an instructional tool. Based on the data collected during this study, recommendations included incorporating identified curriculum characteristics and classroom dynamics that facilitate technology integration into teacher professional development.

Kanaya, Light, and Culp (2005) surveyed 237 K-12 teachers who participated in the Intel Teach to the Future program. These teachers completed their training during 2002. Results from this study indicated the intensity of technology professional development was more successful in predicting participant outcomes of integrating technology into the curriculum than the duration of the program. The researchers suggested two characteristics of technology professional development programs, intensity and pedagogical relevance, determined whether there was a change in instructional methods in the classroom. However, the data collected by NCES from 1999-2000 pertaining to teacher professional development contradicted the findings of this study. Based on the collected data, teachers' perceptions pertaining to the usefulness of professional development were determined by the amount of time spent in professional development. The more time spent on professional development related to technology integration, the more likely teachers were to report student use of computers during class time (Choy, Chen, & Bugarin, 2006).

Most universities have included a technology integration program into their teacher preparation programs (Smerdon et al., 2000). As proposed by Mills and

Tincher (2003), preparing new teachers who integrate technology is an action that should continue throughout the teachers' professional preparation in order to truly develop technology expertise. In order for teachers to support technology integration, they should be involved in the decisions pertaining to integration and training because it affects them (Scoolis, 1999). Mills and Tincher (2003) posited the potential for student learning is increased when teachers understand how to utilize instructional tools and then actually integrate these tools in instruction.

To ensure the success of staff development programs, the programs need to address teachers' needs. In the study conducted by Pritchard and Marshall (2002), 11 states were analyzed to determine what characteristics existed in a district that ensured continued and successful professional development. The researchers purported district views of professional development were related to student achievement, school climate and decision making. The data collected during this study supported the researchers' beliefs with successful districts utilizing professional development as part of the district's vision in order to maintain change.

Individualized instructional support has proven to be particularly beneficial in the Auburn School District of Washington. The Auburn School District utilizes a technology team that helps support the integration of technology into the classroom. Auburn's staff development has been successful because the Instructional Technology teams address individual needs or groups whose needs are similar (Milone, 2000).

Change Process

Teachers' openness to change may also affect the integration of technology into the classroom. However, according to Fullan (2003), "All change worth its salt involves anxiety and conflict..." (p. 101). In a study conducted by Baylor and Ritchie (2002), data indicated that teachers who were more open to change were more apt to integrate technology into the classroom. As indicated by Vannatta and Fordham (2004), openness to change along with professional development and commitment are vital predictors of technology integration; however, openness to change includes the concept of technology integration and the professional development that is needed in order to effectively integrate technology in the classroom. Even so, teachers can be helped during the change process of technology integration via models, mentors, and peers (Ertmer et al., 1999). Also, resistance to change can become an entity that is utilized to improve professional development (Janas, 1998).

Summary

Previous studies have discussed the importance of technology with regard to student involvement, student achievement, and society (Maurer & Davidson, 1999; Salomon & Perkins, 1996; Sherry et al., 2001; Waxman, Lin, & Michko, 2003; Wenglinsky, 1998). Even so, there are factors such as teachers' attitudes, administrator practices, administrator behaviors, and professional development that affect technology integration (Anderson & Dexter, 2005; Ertmer et al., 1999; Leh 2000; Mills, 1999; Mills & Tincher, 2003). The current study examined all factors; teachers' attitudes toward technology, administrator practices and

behaviors, and professional development, and the implications for technology integration into the classroom.

This present study investigated whether teachers' attitudes toward technology affected their levels of technology integration into the classroom. This study also investigated whether perceived support from administrators was related to teachers' levels of technology integration into the classroom. In Chapter Three, the methodology for conducting this study will be discussed.

CHAPTER III

METHODOLOGY

Introduction

The researcher gathered data to investigate whether teachers' attitudes toward technology was related to their levels of technology integration into the classroom. The researcher also investigated whether perceived support from the administrator as the instructional leader was related to teachers' levels of technology integration into the classroom. The questionnaire responses of the middle and high school teachers in the identified school districts were analyzed for similarities and differences in levels of technology integration, attitudes toward technology use in the classroom, confidence and comfort with technology, instructional strategies incorporating technology, and administrative support with regard to technology utilization. In this chapter, the following topics are addressed: identified population, research design, instrumentation, data collection procedures, and data analysis procedures.

Identified Population

The population for this study was identified school districts in rural North Georgia. Selection of participatory districts began with the district where the researcher was employed. Utilizing the National Center for Education Statistics (NCES) Public School District Finance Peer Search for the 2002-2003 school year, the researcher identified five peer districts: Franklin County, Gilmer County, Stephens County, Union County, and White County. The 2002-2003 data was the most current fiscal data available through the NCES peer matching system at

the time of the study. However the percentage of children in poverty is based on data from the 2002 calendar year. Within the NCES database, the Public School District Finance Peer Search was utilized to determine peer groups. Criteria for peer search included *total number of students in the district, student/teacher ratio, percentage of children in poverty, district type, and locale code* (see Table 1).

Table 1

Peer Search Data

	Franklin	Gilmer	Stephens	Union	White
Total Students	3,657	4,036	4,313	2,626	3,863
Student/Teacher Ratio	15.3	15.6	14.5	14.4	15.6
% of Children in Poverty	18.6	20.5	19.9	19.3	16.4
District Type	Regular	Regular	Regular	Regular	Regular
Locale Code	Rural	Rural	Rural	Rural	Rural

Based on demographics, the identified 5 school districts (11 schools) included in this study were regular districts located in rural areas and comparable in total number of students, student/teacher ratio, and percentage of children in poverty. Because of the small number of teachers in the targeted schools in each district, all teachers within a district were invited to participate in the study. Six hundred forty-two teachers were invited to participate in the study.

Research Design

This study utilized multiple linear regression to address the five research questions. Multiple linear regression is a statistical method utilized to predict a

criterion (dependent) *variable* from predictor (independent) *variables* and determine relationships between these variables. With the current study, the predictor variables were *attitude* toward technology use in the classroom, *confidence and comfort* with technology, *instructional strategies* incorporating technology, and *administrative support* with regard to technology utilization. The criterion variable was teachers' levels of *technology integration* into the classroom.

Instrumentation

The *Perceptions of Computers & Technology* questionnaire (see Appendix A) was utilized in this study. This instrument was chosen because it can elicit data to generate answers pertaining to the study's research hypotheses. The instrument was designed by Kristine Y. Hogarty, Thomas R. Lang, and Jeffrey D. Kromrey in 2003 to assess how educators use technology in the classroom and their levels of experience with computers. Subsections of this instrument was designed to specifically assess attitude toward technology use in the classroom, confidence and comfort with technology, instructional strategies incorporating technology, and administrative support with regard to technology utilization. The instrument was obtained from ETS test collection and was reproduced for this study with permission from ETS (see Appendix B) and author Kristine Y. Hogarty (see Appendix C).

The instrument contains 107 items divided into 9 sections: teacher preparation for computer use; confidence and comfort using computers; general school support; types of software used to complete school related activities;

integration of computers into the classroom; personal use of computers; technical support; attitudes towards computer use; and personal demographics. Teacher preparation for computer use (8 items), confidence and comfort using computers (9 items), and general school support (7 items) are measured on a 5-point Likert-type frequency scale ranging from *not at all* to *entirely*. Types of software used to complete school related activities (28 items), integration of computers into the classroom (12 items), personal use of computers (5 items), technical support (7 items), and attitudes towards computer use (20 items) are measured on a 5-point Likert-type scale ranging from *not at all* to *everyday*. The option of not applicable was provided for the following sections: types of software used to complete school related activities; integration of computers into the classroom; and personal use of computers.

The demographics section of the instrument solicits data pertaining to personal, teaching, and technology integration demographics. Personal demographic information addresses the participant's school, gender, race/ethnicity, highest degree earned, and the subject area(s) the participant is currently teaching. With the teaching demographics, the researcher was able to collect data pertaining to years of total teaching experience, grade levels that are taught, and average number of students per class. Technology integration demographics address the number of computers in the classroom that are utilized for instruction, years the participant has been utilizing computers in the classroom for instruction, access to a computer lab, and how many hours each week that students use the computer lab.

Table 2 presents the hypotheses for this study, the variable categories, and the corresponding questions that were used from the instrument for each hypothesis.

Table 2

Hypotheses Variables and Corresponding Instrument Questions

Hypothesis	Variable	Corresponding Questions
1	Attitude, Confidence and Comfort, Instructional Strategies, and Support	9-52 77-96
2	Attitude	77-96
3	Confidence and Comfort	9-17
4	Instructional Strategies	25-52
5	School Support	18-24

Reliability – Reliability analyses were conducted on each scale by the scale developers to determine how well they performed as measurement instruments to determine perceptions of computers and technology (Hogarty, Lang, & Kromrey, 2003). In order to further investigate the reliability scores, Cronbach's alpha was calculated. The results of these analyses are summarized per section in Table 3, Table 4, Table 5, and Table 6.

Table 3

Cronbach's Coefficient Alpha for Integration Scale and Subscales

Scale	#Items	Factor 1	Factor 2
Teacher Software Use	14	.79	.76
Student Software Use	14	.75	.76
Integration of Computers into the Classroom	12	.89	
Personal Use	5	.74	

Table 4

Cronbach's Coefficient Alpha for Support Scale and Subscales

Scale	#Items	Factor 1
General School Support	7	.82
Technical Support	5	.86

Table 5

Cronbach's Coefficient Alpha for Confidence and Comfort Scale

Scale	#Items	Factor 1
Confidence and Comfort	9	.91

Table 6

Cronbach's Coefficient Alpha for Attitude toward Computer Use Scale

Scale	#Items	Factor 1	Factor 2
Attitude Toward Computer Use	19	.79	.77

Validity – The scale authors assured validity via content experts and pilot testing. This is a valid instrument for measuring teacher *attitudes* toward technology and their levels of *technology integration* into the classroom and whether

administrator *support* affects teachers' levels of *technology integration* into the classroom.

Principal interview questions were formulated by the researcher and a research member of the committee (see Appendix D) based on the "General School Support" subscale of the *Perceptions of Computers & Technology* instrument. The purpose of these interview questions was to determine whether principals believed their behaviors supported technology integration into the classroom. The interview questions addressed administrators' perceptions pertaining to the purpose of technology in the school curriculum, teachers' levels of technology integration into classrooms, and items that may impact teachers' comfort levels in integrating technology into the classroom. Participating administrators were also asked to explain ways in which they integrate technology into their schools and how they support technology integration into classrooms.

Data Collection Procedures

Permission to conduct this study was obtained from the IRB at The University of Southern Mississippi (see Appendix E) prior to data collection. The respondents for this study consisted of 642 certified classroom teachers in the target districts. After obtaining approval of the school superintendent in each district (see Appendix F), all teachers of the respective district were notified of the questionnaire via email (see Appendix G) during the winter of 2006. Email addresses of teachers were obtained from the principal of each school district. This email informed the participants that the questionnaire would be mailed at a

later date, encouraged participation, described the purpose of the questionnaire, and informed the respondents that participation is completely voluntary and anonymous, only the school and district would be identified.

Approximately one week after the initial email, a questionnaire packet was delivered to each school district included in the study. The principal of each school distributed the packets to his/her teachers. Each packet contained 1) a cover letter (see Appendix H) providing information about the study and directions for the completion and return of the questionnaire, 2) the *Perceptions of Computers & Technology* questionnaire, and 3) a self-addressed stamped envelope to return the questionnaire. Approximately two weeks after questionnaires were mailed to teachers, a follow up email (see Appendix I) was sent thanking respondents for their participation and encouraging those who may not yet responded to return their questionnaires. Due to the anonymity of the questionnaire, all teachers received the same email message.

Emails were sent to the principals of the schools in the target districts (see Appendix J). This email described the purpose of the study, the interview process, and requested participation in the interview process. Principal interviews were conducted when the researcher delivered the questionnaire packets to the participating schools. Each interview session lasted approximately 10 minutes and was digitally tape recorded. After each session, the researcher transcribed the interview (see Appendix K) by utilizing Word to type and store administrator responses.

Data Analysis Procedures

Incoming data was monitored by the researcher and sorted according to school district and school. Data was sorted and stored in SPSS. Multiple linear regression was used to test the hypotheses of the study using a .05 alpha level for each. This statistical procedure was utilized in order to determine whether *attitudes* toward technology use in the classroom, *confidence* and *comfort* with technology, *instructional strategies* incorporating technology, and/or perceived *support* from administration predicted teachers' levels of technology integration into the classroom. Results from the compilation were analyzed by the researcher. Additional analyses investigated the relationship of the demographic variables to technology integration. The researcher also analyzed administrator interview responses by evaluating and recording common responses or themes for each question.

Summary

The researcher examined whether teachers' *attitudes* toward *technology integration* was related to their levels of *technology integration* into the classroom. The researcher also investigated whether perceived *support* from the administrator as the instructional leader was related to teachers' levels of *technology integration* into the classroom. The *Perceptions of Computers & Technology* questionnaire provided data to support the following research questions: 1) How accurately can *attitude* toward technology use in the classroom, *confidence* and *comfort* with technology, *instructional strategies* that incorporate technology, and perceived *support* from administration predict

teachers' levels of *technology integration* into the classroom? 2) How accurately can *attitude* toward technology use in the classroom predict teachers' levels of *technology integration* into the classroom?; 3) How accurately can *confidence* and *comfort* with technology predict teachers' levels of *technology integration* into the classroom?; 4) How accurately can *instructional strategies* that incorporate technology predict teachers' levels of *technology integration* into the classroom?; and 5) How accurately can perceived *support* from administration predict teachers' levels of *technology integration* into the classroom?

The population for this study was identified school districts in rural North Georgia. The five peer districts that participated in the study included: Franklin County, Gilmer County, Stephens County, Union County, and White County. Only certified teachers in the middle and high schools of each district were invited to participate in the study. Because of the small number of teachers in the targeted schools in each district, all teachers within a district were invited to participate in the study. Six hundred forty-two teachers were invited to participate in the study. Multiple linear regression was utilized to analyze data obtained from the questionnaire. Eleven principals were invited to participate in the study. Principal interviews were analyzed for themes that either supported or contradicted teacher perceptions. The results of this study are discussed in Chapter Four.

Chapter IV

ANALYSIS OF DATA

Introduction

Multiple linear regression analysis was conducted to evaluate how well *teachers' attitudes* predict levels of *technology integration* into the classroom. This study also investigated whether perceived *support from the administrator* as the instructional leader was related to teachers' levels of *technology integration* into the classroom. The predictors were *teacher attitudes toward computer use*, *teacher confidence and comfort using computers*, *instructional strategies that incorporated technology*, and *perceived school support*. The criterion variable was *integration of computers into the classroom*. Secondary analyses were conducted to determine whether there was a relationship between *technology integration*, *gender*, *number of computers* in the classroom used for instruction, *teaching experience*, and *subject area taught*. Principal interviews were also conducted to determine whether they believed their behaviors supported *technology integration* into the classroom.

Data Preparation

Data were collected via paper questionnaire and interviews. Eight items comprised the *teacher preparation for computer* subscale, 9 items comprised the *confidence and comfort* subscale, and 7 items comprised the *general school support* subscale. Twenty-eight items comprised the *types of software used to complete school related activities* subscale, 12 items comprised the *integration of computers into the classroom* subscale, 5 items comprised the *personal use of*

computers subscale, 7 items comprised the *technical support* subscale, and 20 items comprised the *attitudes towards computer use* subscale. Questionnaires were delivered to the target school districts. Teachers completed the questionnaires and returned them to the researcher via mail. Principals supplied information via face-to-face interviews with the researcher. Paper results were compiled and analyzed using SPSS. Principal interviews were analyzed for evidence that either supported or contradicted teacher perspectives by looking for phrases or themes.

Description of Sample

A total of 642 certified teachers were invited to participate in the study. The return rate was 42% yielding a final sample of 276 teachers. Sixty-nine of the respondents were male and 207 were female. The final sample of teachers was 1.1% Native American/American Indian and 98.9% White/non-Hispanic. The highest degree earned reported in the sample of teachers was Bachelors (20.7%), Masters (49.3%), Specialist (27.5%), and Doctorate (2.5%). A total of 11 principals were invited to participate in the interview process. Nine principals chose to do so. Demographic data was not collected from the principals.

Descriptive Statistics

To determine whether attitudes do affect technology integration, the following questions provided the basis of the study:

1. How accurately can *attitude toward technology use* in the classroom, *confidence and comfort with technology*, *instructional strategies that*

incorporate technology, and *perceived support from administration* predict teachers' levels of *technology integration* into the classroom?

2. How accurately can *attitude toward technology use* in the classroom predict teachers' levels of *technology integration* into the classroom?
3. How accurately can *confidence and comfort with technology* predict teachers' levels of *technology integration* into the classroom?
4. How accurately can *instructional strategies that incorporate technology* predict teachers' levels of *technology integration* into the classroom?
5. How accurately can *perceived support from administration* predict teachers' levels of *technology integration* into the classroom?

In Table 7, the descriptive statistics for this study are listed. Based upon teachers' perceptions, the mean, standard deviation, and number of responses are listed for the four subscales: *attitude toward computer use; confidence and comfort using computers; instructional strategies that incorporate technology; and perceived school support.*

Table 7

Descriptive Statistics for 6-12 Teacher Sample

	Mean	Standard Deviation	*N*
Attitude	60.80	7.05	276
Confidence and Comfort	33.65	6.78	276
Instructional Strategies	54.41	16.57	276
School Support	24.93	4.53	276

Note. Scale for Attitude, Confidence and Comfort, and School Support was a 5-point Likert type scale ranging from 1-5. Scale for Instructional Strategies was a 5-point Likert type scale ranging from 1-5 with NA as an option. NA was coded as 0. Higher scores indicated higher/more positive relationship toward technology integration.

Research Questions

Multiple linear regression was used to test the hypotheses of the study using a .05 alpha level for each. This statistical procedure was utilized in order to determine whether *attitudes toward technology use in the classroom*, *confidence and comfort with technology*, *instructional strategies incorporating technology*, and/or *perceived support from administration* predict teachers' levels of *technology integration* into the classroom. Of the 276 questionnaires, 50% of the questionnaires were complete. Due to lack of response from participants, 50% of the remaining questionnaires contained missing data. In the initial multiple regression analysis, 50% of the returned questionnaires were not included because of the missing data. To correct this problem, the researcher calculated the mean for each question per grade level, middle school and high school, and these calculated means were then substituted for the missing data in each subscale.

Research Question 1

How accurately can *attitude toward technology use* in the classroom, *confidence and comfort with technology*, *instructional strategies that incorporate technology*, and *perceived support from administration* predict teachers' levels of *technology integration* into the classroom?

Multiple regression analysis was conducted to assess the prediction of teachers' levels of *technology integration* based on *teacher attitudes toward computer use,* teacher *confidence and comfort using computers*, *instructional strategies that incorporate technology*, and *perceived school support.*

Evaluations of linearity, normality, homoscedasticity, and multicollinearity showed that the assumptions were met within acceptable limits. Regression results showed that the linear combination of teacher *attitudes* toward computer use, teacher *confidence* and *comfort* using computers, *instructional strategies* incorporating technology, and perceived administrative *support* in the overall model significantly predicted teachers' levels of *technology integration* into the classroom, $R^2 = .39$, $R^2_{adj} = .38$, $F\ (4, 271) = 43.193$, $p < .001$. This model accounted for 39% of the variance in teachers' levels of technology integration into the classroom. All four variables contributed significantly to the model. The regression coefficients are summarized in Table 8.

Table 8

Coefficients for Model Variables

	B	β	*t*	*p*	Bivariate r	Partial r
Attitudes	.171	.122	2.520	.012	.204	.151
Confidence and Comfort	.397	.271	4.866	.000	.488	.283
Software and School Activities	.221	.369	6.681	.000	.546	.376
School Support	.240	.110	2.195	.029	.278	.132

Research Question 2

How accurately can *attitude toward technology use in the classroom* alone predict teachers' levels of *technology integration* into the classroom?

The results of the multiple linear regression, $\beta = .122$, $t\ (275) = 2.52$, $p = .012$, found a statistically significant relationship between teachers' *attitudes*

toward technology use in the classroom and teachers' levels of *technology integration* into the classroom. Therefore, H_2 was accepted: There was a statistically significant relationship in teachers' levels of *technology integration* with respect to *attitude toward technology use* in the classroom.

Research Question 3

How accurately can *confidence and comfort with technology* alone predict teachers' levels of *technology integration* into the classroom?

The results of the multiple linear regression, $\beta = .271$, $t\ (275) = 4.87$, $p < .001$, found a statistically significant relationship between teachers' *confidence and comfort with technology* and teachers' levels of *technology integration* into the classroom. Therefore, H_3 was accepted: There was a statistically significant relationship in teachers' levels of *technology integration* with respect to *confidence and comfort with technology*.

Research Question 4

How accurately can *instructional strategies that incorporate technology* alone predict teachers' levels of *technology integration* into the classroom?

The results of the multiple linear regression, $\beta = .369$, $t\ (275) = 6.68$, $p < .001$, found a statistically significant relationship between *instructional strategies incorporating technology* and teachers' levels of *technology integration* into the classroom. Therefore, H_4 was accepted: There was a statistically significant relationship in teachers' levels of *technology integration* with respect to *instructional strategies incorporating technology*.

Research Question 5

How accurately can *perceived support from administration* alone predict teachers' levels of *technology integration* into the classroom?

The results of the multiple linear regression, $\beta = .110$, $t\ (275) = 2.20$, $p = .029$, found a statistically significant relationship between *perceived support from administration* and teachers' levels of *technology integration* into the classroom. Therefore, H_5 was accepted: There was a statistically significant relationship in teachers' levels of *technology integration* with respect to *perceived administrative support* with regard to technology utilization.

Secondary Analyses

Correlation coefficients were computed for the following variables: *technology integration, gender, number of computers in the classroom utilized for instruction, years of teaching experience,* and *subject area taught.* The Bonferroni approach was used to control for Type I error with the *p* value less than or equal to .005 (.05/10 = .005). The results for the correlational analyses are presented in Table 9. These results indicated 1 out of 10 correlations was statistically significant. Results suggest that teachers who have high levels of *technology integration* into the classroom have higher *numbers of computers in the classroom used for instruction.* The correlations between *technology integration, gender, years of teaching experience,* and *subject area taught* were nonsignificant.

Table 9

Correlations among the technology integration study variables

	Technology	Computers	Experience	Subject
Gender	.057			
Computers	.412***	.039		
Experience	.086	.052	.015	
Subject	.063	-.046	.094	-.016

*$p < .05$
** $p < .01$
***$p \leq .005$

Principal Interviews

Each principal of the targeted school districts was sent an email requesting an interview appointment. Eleven principals were invited to participate in this process. Nine principals elected to participate. Prior to the interview, the researcher allowed the principal to preview the interview questions (see Appendix H) so the principal would feel more comfortable with the process.

Interview Question 1

What do you think is the purpose of technology in the school curriculum?

Of the 9 respondents, 3 indicated familiarity with technology as being critical to later academic success and also critical to student preparation for post-education careers. Five respondents posited that technology should be used to supplement and support instruction. One respondent believed technology's purpose is to help teachers differentiate instruction.

Interview Question 2

In what ways do you believe that technology can be used as an instructional tool?

Of the 9 respondents, 2 responded that technology can be utilized as a remediation tool. One respondent indicated that technology is currently used to earn course credit in classes such as Latin and microeconomics. Two respondents suggested technology is used mostly for student presentations. Whereas, 3 other respondents indicated that technology can be utilized as an instructional tool to supplement instruction. One respondent considered technology as an administrative tool for course scheduling and student attendance.

Interview Question 3

To what extent do your teachers integrate technology into classroom instruction?

Four respondents indicated the extent to which teachers integrate technology into classroom instruction depends on how long the teacher has been teaching, with new teachers being more open to technology than veteran teachers. These respondents also indicated that experience with technology and the confidence and comfort with technology determines the extent to which teachers integrate technology into the classroom. Three respondents indicated access to operable technology is a determining factor of teachers' levels of technology integration into the classroom. Of these three respondents, one respondent suggested technology was not integrated due to lack of computers and the computers currently in the school were not operable. However, the other

respondent was excited about teachers' levels of technology integration into the curriculum on a daily basis which was possible because teachers had access to 13 computer labs. One respondent indicated that English teachers integrate technology more than teachers of other disciplines. Another respondent indicated technology was utilized as a tool to enhance the curriculum. Although the results of the multiple linear regression analysis indicated a statistically significant relationship between *confidence and comfort with technology* and *technology integration* into the classroom, results of the secondary analyses did not indicate a statistically significant relationship between technology integration into the classroom and age of teacher and subject area taught.

Interview Question 4

What are some things that impact (positive or negative) teachers' comfort level in integrating technology into the classroom?

Of the 9 respondents, 5 indicated the age of teacher or teaching experience impacted teachers' comfort levels in integrating technology into the classroom with new teachers who recently graduated college being more comfortable with technology than veteran teachers. However, results from the secondary analyses indicated no significant relationship between *technology integration* and years of teaching experience. Two respondents indicated lack of comfort and confidence impacted technology integration into the classroom. This belief was supported by the multiple linear regression analysis which indicated a statistically significant relationship between *confidence and comfort with technology* and *technology integration* into the classroom. Two respondents

maintained the unpredictable nature of technology can impact teachers' comfort levels in integrating technology into the classroom.

Interview Question 5

Could you explain some ways in which you integrate technology into your school?

Four respondents utilized technology for record keeping and communication via email. Two respondents utilized technology as a tool to increase test scores. However, two respondents indicated they do not personally integrate technology into their schools, but provide support to teachers so the teachers can integrate technology into their classrooms. One respondent utilized technology for presentations to faculty.

Interview Question 6

What are some specific things you do to support technology integration into classrooms?

Of the 9 respondents, 6 indicated they budget technology money in order to support technology integration into classrooms. Two respondents believed their roles as instructional leaders required them to support technology integration by modeling its use or attending technology professional development with teachers. One respondent supported technology integration into classrooms by providing support to teachers. These strategies were supported by the results of the multiple linear regression which indicated a statistically significant relationship between *support from administration* and *technology integration* into the classroom.

Summary

Multiple linear regression analysis was conducted to evaluate how well teachers' *attitudes* predict levels of *technology integration* into the classroom. Data from the instrument, along with data collected from interviews with principals, were analyzed to determine whether *perceived support from the administrator* as the instructional leader was related to teachers' levels of *technology integration* into the classroom. Results indicated that the variables *attitudes toward technology use in the classroom*, *confidence and comfort with technology*, *instructional strategies incorporating technology*, and/or *perceived support from administration* can significantly predict, as a model and individually, the use of technology in the classroom.

Data collected from principal interviews indicated administrators feel the purpose of technology in the school curriculum is to supplement and support classroom instruction. The majority of the principals who were interviewed also espoused the extent of technology integration into classrooms is dependent upon teachers' classroom experience, with new teachers being more open to technology than veteran teachers. These respondents also indicated that experience with technology and confidence and comfort with technology determines the extent to which teachers integrate technology into the classroom. Participating administrators posited that there is a relationship between the age and/or experience of the teacher and confidence and comfort with technology. Administrator responses pertaining to how they integrate technology into schools revealed that technology is mostly used for record keeping and communication.

With regard to technology support, administrators stated their primary role in technology integration into the classroom is to provide support via technology funding. A discussion of these results is presented in Chapter Five.

CHAPTER V

SUMMARY OF FINDINGS, IMPLICATIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

As a result of the evolution of technology and its role in society, educational institutions have the responsibility of promoting technology literacy and competency. To ensure that teachers and students demonstrate a certain level of technology competency, technology standards have been established by NCLB, NETS, state technology standards, and teacher certification (Enhancing Education Through Technology Act, 2001, §2413; Georgia Department of Education, 2005; Georgia Professional Standards Commission, 2005; ISTE NETS, 2005).

The purpose of this study was to evaluate if there was a relationship between teachers' levels of *technology integration* into the classroom and *attitudes toward technology, confidence and comfort with technology, instructional strategies that incorporate technology,* and *perceived support from administration*. Principal interviews were conducted to investigate whether their behaviors supported technology integration into the classroom.

Summary of Findings

During the Spring 2006 semester, the *Perceptions of Computers & Technology* questionnaire was administered to 642 certified teachers in 11 schools in rural North Georgia. The return rate was 42% yielding a final sample of 276 teachers. A total of 11 principals were invited to participate in the interview

process. Nine principals chose to do so. This section will present the findings obtained from this study and the implications of this study as it relates to the literature.

Finding 1

Data analyses indicated there was a statistically significant relationship between teachers' levels of *technology integration* based on *teacher attitudes toward computer use, teacher confidence and comfort using computers, instructional strategies that incorporate technology,* and *perceived school support.* This finding is consistent with the literature summarized in this study. Mills (1999) indicated that successful technology integration depended on teachers' approval, acceptance, and implementation. Hazzan (2000) found there is anxiety associated with the role of computers in the classroom because technology may change the familiar persona of the traditional teacher.

Galowich (1999) indicated that technology is not truly incorporated into instructional strategies due to the teacher's attitude toward technology. Dalton and Hannafin (1988) posited both traditional instruction and computer-based instruction increase their values when they are used to compliment each other. However, Medcalf-Davenport espoused teachers view the computer as the curriculum instead of viewing it as a tool to teach the curriculum. To facilitate reflection on learning and practice, administrators should provide teachers with suggestions, demonstrations, examples, and personal experiences and model appropriate instructional techniques (Blasé & Blasé, 2000; Blasé & Blasé, 2001).

Finding 2

Data analyses indicated there was a statistically significant relationship between teachers' levels of *technology integration* and *teacher attitudes toward computer use.* This finding is consistent with the literature summarized in this study. Galowich (1999) posited "... teacher's use of technology to teach in the classroom is more likely to be higher when his or her attitude (separate from usage) and technology usage outside of work (separate from attitude) are higher" (p. 6). Ertmer et al. (1999) stated teachers' beliefs pertaining to instructional practices affected how technology is viewed and used.

Finding 3

Data analyses indicated there was a statistically significant relationship between teachers' levels of *technology integration* and *teacher confidence and comfort using computers*. This finding is consistent with the literature summarized in this study. Marcinkiewicz (1994) stated innovativeness and self-confidence in the use of computers were more closely related to teachers' computer use. Hogarty, Lang, and Kromrey (2003) suggested a positive relationship between teachers' perceptions of computers and teachers' confidence and comfort with regard to computers and computer applications.

Finding 4

Data analyses indicated there was a statistically significant relationship between teachers' levels of *technology integration* and *instructional strategies that incorporate technology*. This finding is consistent with the literature summarized in this study. McDonald and Hannafin (2003) found that benefits of

Web-based computer games included increased discussions, increased interest, and more time spent on subjects. Barron, Kemker, Harmes, and Kalaydjian (2003) conducted a study focusing on teachers' instructional modes and technology integration. Although this particular study focused on elementary school teachers and high school teachers, data revealed some teachers utilized technology with certain instructional strategies such as problem-solving or decision-making assignments and communication. If teachers have a reason to utilize technology, they are more apt to integrate technology (Scoolis, 1999).

Finding 5

Data analyses indicated there was a statistically significant relationship between teachers' levels of *technology integration* and *perceived school support*. This finding is consistent with the literature summarized in this study. To transform a learning culture and promote technology integration, administrators must provide support that includes commitment, leadership, organization, finance, and faculty development (Wizer & McPherson, 2005). Administrators who support technology integration and professional development pertaining to technology integration are essential in developing a school culture that utilizes and integrates technology (Baylor & Ritchie, 2002; Dupagne & Krendl, 1992).

Secondary Findings

Results suggested that teachers who have high levels of *technology integration* into the classroom have higher *numbers of computers in the classroom used for instruction*. The correlations between *technology integration, gender, years of teaching experience,* and *subject area taught* were

nonsignificant. The secondary finding of teachers who have high levels of technology integration into the classroom have higher numbers of computers in the classroom used for instruction is consistent with the literature summarized in this study. Smerdon et al. (2000) and Mills and Tincher (2003) posited not enough computers in the classroom can affect technology integration into classrooms. In the study conducted by Leh (2000), educators expressed concerns with regard to technology integration into their classrooms because of the lack of computers in the school or the current computers in their schools were inadequate.

Findings of the secondary analysis were not consistent with the literature summarized in this study and principal interviews that were conducted as part of this study with regard to years of teaching experience and subject area taught. The sentiments of most of the principals who were interviewed can be summarized by the following statement. "If they have been teaching a long time, they are probably not using technology as much because they did not learn that through their college courses." Barron, Kemker, Harmes, and Kalaydjian (2003) suggested there were differences in technology integration according to subject area with science teachers utilizing technology more than social studies, English, and math teachers. Mills (1999) stated approval, acceptance, and implementation of technology by teachers may vary according to grade level and subject area.

Principal Interview Findings

Findings of the principal interviews are consistent with the literature summarized in this study. Technology can influence student involvement including providing teachers with time to interact one-on-one with students, evaluate student progress, and expand educational opportunities (Gough, 1997). Crawford, Bodine, and Hoglund (1993) believed technology is relevant in the educational arena because it is relevant in society. Therefore, school districts should be preparing individuals for their roles in society via technology integration. Basic technology skills are needed for most entry level positions, and businesses want to hire trained people instead of providing training (Zimmerman, 2001). Self-confidence in the use of computers is related to teachers' computer use (Marcinkiewicz, 1994). Teachers experience difficulty in integrating technology into classrooms due to lack of computers or inadequate computers (Leh, 2000).

Thomas and Knezek (2002) proposed that in order for technology to be utilized effectively, administrators must realize that technology can be an effective tool in increasing student achievement. To transform a learning culture and promote technology integration, administrators must provide support that includes commitment, leadership, organization, finance, and faculty development (Wizer & McPherson, 2005). Effective principals modeled best practices in teaching in classrooms and during conferences (Blasé & Blasé, 2000).

Limitations

This study was limited as follows:

1. The variables on the instrument used to measure administrative support.
2. Lack of comparable technology hardware and software in each district.
3. Data collection methods were limited to self reported data not verified by classroom observations and teacher interviews.
4. The response rate of participants who were asked to participate in the study.
5. Forced-choice items on questionnaire.

Implications for School Districts

School districts need to establish district wide technology plans that address short term and long term technology goals. This plan should include a technology budget to address technology acquisitions and technology professional development. Often times, schools do not consider what is needed in order to maintain technology hardware. As a result, the technology the school does have becomes obsolete. "I try to put technical funding there...These things have a shelf life. Replacements are part of it" (Personal Communication, January 25, 2006).

Computer literacy training is an integral part of teacher certification because Georgia teachers must be highly qualified by June 2006. Some teachers are receiving technology training but are unable to integrate these skills in the classroom due to the lack of computers, inoperable computers, and/or the lack of computer software. "We do not do what we should as far as utilizing [technology]

to the maximum because we have a lot of trouble with our computers" (personal communication, January 10, 2006).

With InTech, teachers are exposed to various software applications. However, teachers are unable to utilize these applications because their schools do not own the software or do not have a site license for the software. This makes the mandatory technology professional development useless because most school technology plans include acquiring technology hardware but do not address software acquisitions.

Implications for Professional Development

In order to continue professional growth, teachers and administrators need to be involved in continuous professional development. As proposed by Mills and Tincher (2003), preparing new teachers who integrate technology is an action that should continue throughout the teachers' professional preparation in order to truly develop technology expertise. However, professional development needs to be individualized. With the current InTech program, every participant receives the same instruction regardless of their technology expertise. Because of the format of this professional development, some participants are exposed to new technology skills whereas others are exposed to skills they are already incorporating into their classrooms. Eventually, participants become frustrated because the professional development is not differentiated based on technology expertise and knowledge.

To correct this problem, school systems should conduct a needs assessment. Based on the needs assessment, school systems can determine which

professional development programs should be offered and who should be included in these programs. In addition to differentiating technology professional development, school systems need to offer technology professional development that is continuous instead of a one- time program. These follow-up sessions should clarify, enhance, and promote technology integration into the classroom. "Teachers, even those who are computer literate, need a vision of technology in the learning process, and that vision needs to expand as learning technology changes" (Collier, 2001).

Implications for Educational Administrators

Even though school systems may have a technology plan in place, the responsibility of implementing the plan resides with the school administrator. Supporting technology integration into the classroom requires more than budgeting money. Anderson and Dexter (2005) concluded that "a school's technology efforts are seriously threatened unless key administrators become active technology leaders in a school" (p. 74).

Because the principal is the instructional leader of the school, best practices need to be introduced, supported, and modeled by this person. Administrators should promote instructional practices that incorporate technology into the curriculum. However, the principal cannot truly be the instructional leader of the school unless he/she has received appropriate technology professional development. According to Dawson and Rakes (2003), one third of the principals who participated in their study were not receiving the training to be instructional leaders with regard to technology integration. If administrators are not trained in

technology integration, they may not understand how to properly integrate technology into the curriculum. "To provide the leadership necessary for success, principals, and school district leaders must have sufficient knowledge of technology to guide them in their decision making in two critical areas: technology planning and staff development" (Holland, 2000, Introduction section). Technology professional development for administrators should facilitate their need to be abreast new technology trends and advancements in order to keep their schools current with regard to state and national standards.

Recommendations for Further Research

Based on the process and results of this study, several recommendations are offered for future studies pertaining to teacher attitudes and technology integration.

1. Replicate the study using a larger population of teachers in the state of Georgia, including a comparison of rural and urban school teachers. According to the U.S. Department of Education (2003), Internet access is more present in rural areas with 93% compared to city schools with 88%.
2. Replicate the study including teacher interviews. In the present study, the researcher received written comments in addition to the questionnaire data. These comments elaborated on why teachers responded in a particular manner. With teacher interviews, the researcher can elicit more data with regard to technology integration.

3. Replicate the study including classroom observations. With classroom observations, the researcher can determine whether teachers are utilizing best practices with regard to technology integration.
4. Replicate the study including student interviews. Student interviews can elaborate on how technology is utilized, how often technology is utilized, and whether technology affects the learning environment in a negative or positive manner.
5. Replicate the study comparing middle school teachers to high school teachers. Because middle school teachers teach more than one academic subject, is there a difference in middle school teachers' levels of technology integration when compared to high school teachers?
6. Replicate the study including school superintendents. School superintendents have an influence on the money that is budgeted for each school and can influence how that money is spent. Because of this, do the school superintendent's attitudes toward technology influence the amount of technology in each school?
7. Replicate the study distinguishing between regular education teachers, gifted teachers, and special education teachers' levels of technology integration into the classroom. Because of the difference in learning styles of students and academic capabilities, is there a difference in how specific area teachers integrate technology into the classroom?

Conclusion

Promoting technology integration into the classroom does depend on teacher attitudes, teacher confidence and comfort with regard to technology, instructional practices that incorporate technology, and perceived support from faculty and administration. The integration of technology into the classroom is a necessity in order to enhance instruction and prepare students for an active role in society. In order to achieve this goal, teachers must have confidence and comfort with technology along with access to technology. Perceived support from administrators did have a statistically significant relationship with regard to teachers' levels of technology integration into the classroom. As a result, financial support is necessary in order to ensure proper professional development and the acquisition of appropriate technology hardware and software. Even so, support from administration needs to include the modeling of best practices with regard to technology integration. If schools are going to meet the standards set forth by state and federal guidelines such as NCLB, and enhance the employability skills of students, school districts need to develop a technology plan that ensures immediate and future integration of technology into the curriculum.

Appendix A
PERCEPTIONS OF COMPUTERS & TECHNOLOGY INSTRUMENT

Purpose: This survey is designed to gain a better understanding of how educators use technology in the classroom and their level of experience with computers. The survey includes sections addressing level of confidence, skill, support, and uses of computers and technology in teaching. Responses will be kept strictly confidential and individual responses will not be identified or reported. Your participation is voluntary.

Thank you for your time and interest.

TEACHER PREPARATION FOR COMPUTER USE

Directions: For the following items please circle the one response that best reflects the extent to which you've acquired computer skills from the following sources.

1= not at all
2= to a small extent
3= to a moderate extent
4= to a great extent
5= entirely

As part of your undergraduate work	1	2	3	4	5
In-service courses/workshops	1	2	3	4	5
Independent learning (e.g., online tutorials or books)	1	2	3	4	5
Interaction with other faculty/staff	1	2	3	4	5
Distance Learning courses	1	2	3	4	5

To what extent do you think the following types of Computer education would be beneficial to you?

Introductory computer skills	1	2	3	4	5
Specific applications (e.g., spreadsheet, desktop publishing)	1	2	3	4	5
Specialized training on integrating the computer into the classroom	1	2	3	4	5

CONFIDENCE AND COMFORT USING COMPUTERS

Directions: Please read the following statements and circle the one response that best reflects your level of agreement.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

I have had adequate training in using computers.	1	2	3	4	5
I use computers effectively in my classroom.	1	2	3	4	5
I am comfortable giving computer assignments to my students.	1	2	3	4	5
The computer enhances my teaching.	1	2	3	4	5
I am comfortable using computers during classroom instruction.	1	2	3	4	5
My use of computer technology enhances student performance.	1	2	3	4	5
Incorporating multimedia into lessons enhances teaching.	1	2	3	4	5
I am comfortable with computer terminology.	1	2	3	4	5
I am developing expertise in the uses of technology in The classroom.	1	2	3	4	5

GENERAL SCHOOL SUPPORT

Directions: Please read the following items and circle the one response that best represents your level of agreement.

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

I have adequate time to learn computer skills.	1	2	3	4	5
I have sufficient access to computers at my school.	1	2	3	4	5
I receive a sufficient level of computer related support at my school.	1	2	3	4	5
Faculty members encourage the use of computers.	1	2	3	4	5
The administration supports computer related training.	1	2	3	4	5
The administration actively encourages the use of computers the classroom.	1	2	3	4	5
The administration actively encourages the use of computers outside the classroom.	1	2	3	4	5

TYPES OF SOFTWARE USED TO COMPLETE SCHOOL RELATED ACTIVITIES

1= not at all
2= once a month
3= once a week
4= several times a week
5= every day

Directions: For each type of software please circle your response to indicate how often you use the software (on the left) and how often your students use the software (on the right) to complete school related activities. If you feel an item does not apply then circle (NA).

1= not at all
2= once a month
3= once a week
4= several times a week
5= every day

My Use		My Students' Use	
1 2 3 4 5 NA	Word processors (e.g., AppleWorks, MS Word, ClarisWorks)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Spreadsheets (e.g., Excel, Lotus)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Databases (e.g., FileMaker Pro, Access)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Desktop publishing programs (e.g., Pagemaker, Microsoft Publisher, Printshop)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Presentation software (e.g., PowerPoint, Persuasion, Hyperstudio)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Web publishing programs (e.g., FrontPage, PageMill, Dream Weaver, Claris Homepage)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Graphics programs (e.g., Draw & paint programs, PhotoShop, FreeHand, Illustrator)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Drill and practice	1 2 3 4 5 NA	
1 2 3 4 5 NA	Games	1 2 3 4 5 NA	
1 2 3 4 5 NA	Simulations	1 2 3 4 5 NA	
1 2 3 4 5 NA	Tutorials	1 2 3 4 5 NA	
1 2 3 4 5 NA	Integrated Learning Systems (e.g., Josten, CCC)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Web browers (e.g., Netscape Communicator, Internet Explorer)	1 2 3 4 5 NA	
1 2 3 4 5 NA	Programming/authoring tools (e.g., Authorware, Java, Visual Basic)	1 2 3 4 5 NA	

INTEGRATION OF COMPUTERS INTO THE CLASSROOM

Directions: Listed below are teaching modes in which computers may be used. Indicate how often you use computers in each teaching mode. If you feel an item does not apply then circle (NA).

1= not at all
2= once a month or less
3= once a week
4= several times a week
5= every day

Small group instruction	1	2	3	4	5	NA
Individual instruction	1	2	3	4	5	NA
Cooperative groups	1	2	3	4	5	NA
As a reward	1	2	3	4	5	NA
Independent learning	1	2	3	4	5	NA
To tutor	1	2	3	4	5	NA
To promote student centered learning	1	2	3	4	5	NA
As a research tool for students	1	2	3	4	5	NA
As a problem solving/decision making tool	1	2	3	4	5	NA
As a productivity tool (to create charts, reports or other products)	1	2	3	4	5	NA
As a classroom presentation tool	1	2	3	4	5	NA
As a communication tool (e.g., email, electronic discussion)	1	2	3	4	5	NA

YOUR PERSONAL USE OF COMPUTERS

Directions: Please read each statement and circle the one response that best reflects the frequency of your computer use. If you feel an item does not apply then circle (NA).

1= not at all
2= once a month or less
3= once a week
4= several times a week
5= every day

For multimedia activities (e.g., CD-ROM, laserdiscs)	1	2	3	4	5	NA
For fun/entertainment related activities	1	2	3	4	5	NA
As a communication tool (e.g., email, electronic discussion)	1	2	3	4	5	NA
As a productivity tool (to create charts, reports or other products)	1	2	3	4	5	NA
As a research tool	1	2	3	4	5	NA

TECHNICAL SUPPORT

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

Does your school have an on-site computer support specialist?
Yes _____ No _____ Don't Know _____
If yes, how many computer support specialists does your school have? _____.
If no or don't know, then skip this section and move on to the next section.

The on-site computer specialist adequately assists me in problem solving and trouble shooting.	1	2	3	4	5
The on-site computer specialist is dedicated to helping teachers.	1	2	3	4	5
I have adequate access to our on-site computer specialist.	1	2	3	4	5
I have to contact our specialist several times before I get assistance.	1	2	3	4	5
Our computer specialist shows me techniques to integrate computer technology into the classroom.	1	2	3	4	5

ATTITUDES TOWARDS COMPUTER USE

1= strongly disagree
2= disagree
3= neutral
4= agree
5= strongly agree

Directions: The following statements address general attitudes towards computer use. Please circle the one answer that best reflects your level of agreement.

I would like every student in my classes to have access to a computer.	1	2	3	4	5
Computer skills are essential to my students.	1	2	3	4	5
I feel tense when people start talking about computers.	1	2	3	4	5
I feel pressure from others to integrate the computer more into my classroom.	1	2	3	4	5
I would like my students to be able to use the computer more.	1	2	3	4	5
Computers are dehumanizing.	1	2	3	4	5
I avoid the computer whenever possible.	1	2	3	4	5
Computer instruction is just another fad.	1	2	3	4	5
The use of computers should be confined to computer courses.	1	2	3	4	5
I like using the computer to solve complex problems.	1	2	3	4	5
More training would increase my use of the computer in the classroom.	1	2	3	4	5
Computers diminish my role as a teacher.	1	2	3	4	5
Computers should be incorporated into the classroom curriculum.	1	2	3	4	5
Computers make my job easier.	1	2	3	4	5
Computers further the gap between students along socio-economic lines.	1	2	3	4	5
Computer skills will help me as a professional	1	2	3	4	5
Learning computers make high demands on my professional time.	1	2	3	4	5
Computers change my role as a teacher.	1	2	3	4	5
I can help others solve computer problems.	1	2	3	4	5
Computers enhance classroom instruction.	1	2	3	4	5

Please tell us about yourself:

Name of your school: _____

Gender: Male _____ Female _____

Race/Ethnicity:

_____ Native American/American Indian
_____ African American
_____ White/non-Hispanic
_____ Asian/Pacific Islander
_____ Hispanic
_____ Other, please specify _____.

Highest degree earned:

_____ Bachelors
_____ Specialist (Ed.S)
_____ Other, please specify _____.
_____ Masters
_____ Doctorate

What subject area(s) do you teach? (Check all that apply)

_____ English
_____ Math
_____ Physical Education
_____ Science
_____ Social Studies
_____ Other, please specify _____.
_____ Art/Music
_____ Media/Technology Specialist
_____ Special Education
_____ Vocational Education
_____ Reading

Total teaching experience in years: _____
What grade level(s) do you currently teach? _____
Average number of students per class: _____
Number of computers in your classroom used for instruction: _____
How many years have you been using computers in your classroom for instruction? _____.
Do you have access to a computer lab? _____ Yes _____ No
If yes, how many hours each week do your students use the lab? _____

APPENDIX B
ETS PERMISSION TO USE INSTRUMENT

NOTICE

The ETS Test Collection provides microfiche and digital copies of certain unpublished tests as a service to educators and psychologists. It is hoped that these materials will provide users with creative ideas for the development of their own instruments, or, in some instances, with measures of attributes for which no published tests are available.

The materials included on the microfiche and digital copies may be reproduced by the purchasers for their own use unless otherwise notified by the author. Permission to use these materials in any other manner must be obtained directly from the author. This includes modifying or adapting the materials, and selling or distributing them to others. Any copyright notice or credit lines must be reproduced exactly as provided on the original.

Typically, the tests included in this service have not been subjected to the intensive investigation usually associated with commercially published tests. As a consequence, inclusion of a test does not imply any judgment by ETS of the quality or usefulness of the instrument. The purchases must assume full responsibility for controlling access to these materials, the manner in which they are used, and the interpretation of data derived from their application.

It is recommended that access to these microfiche be limited to staff members of professionally recognized educational and psychological institutions or organizations, and individuals who are members of the American Educational Research Association, the American Psychological Association; the National Council on Measurement in Education, or the Association for Measurement and Evaluation in Guidance. The qualification of others not in these categories should receive careful consideration.

Finally purchasers are urged to provide information about their use of these materials directly to the authors. Many cooperating authors are interested in collecting data on their instruments which will make them more useful to others. Therefore, it is to the advantage of everyone concerned authors, present users, and users in the future - that purchaser recognize their professional responsibility to initiate such communication. The address of the author of this instrument as of the date on which this series was released:

Kristine Y. Hogarty
Department of Educational Measurement
& Research
University of South Florida
4202 E. Fowler Avenue, EDU 162
Tampa, FL 33620

APPENDIX C
AUTHOR'S PERMISSION TO USE INSTRUMENT

Good morning Sheri,

I had no idea that ETS would charge any amount when they asked me to register the survey with them. How unfortunate.

I have no problem if you wish to use the survey in your dissertation research. I'm just happy that the instrument is useful!

Take care,

Kris

APPENDIX D
PRINCIPAL INTERVIEW QUESTIONS

1. What do you think is the purpose of technology in the school curriculum?

2. In what ways do you believe that technology can be used as an instructional tool?

3. To what extent do your teachers integrate technology into classroom instruction?

4. What are some things that impact (positive or negative) teachers' comfort levels in integrating technology into the classroom?

5. Could you explain some ways in which you integrate technology into your school?

6. What are some specific things you do to support technology integration into classrooms?

APPENDIX E
IRB APPROVAL

The University of Southern Mississippi

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **25121304**
PROJECT TITLE: **Teacher Attitudes and Levels of Technology Integration**
PROPOSED PROJECT DATES: **10/26/05 to 05/12/06**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Sheri Leigh Bradshaw**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Educational Leadership & Research**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **12/13/05 to 12/12/06**

Lawrence A. Hosman
Lawrence A. Hosman, Ph.D.
HSPRC Chair

12-13-05
Date

APPENDIX F
SCHOOL SUPERINTENDENT APPROVAL

Sheri,

You have permission to include Franklin County Middle School and Franklin
County High School in your study.

Frederic E. Ayer, Superintendent
Franklin County Schools

Dr. Ayer,

I am currently working on my doctorate degree in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. My dissertation topic pertains to teachers' attitudes toward technology and their levels of integration in the classroom. I will also be looking at whether principals impact teachers' levels of technology integration.

In order to meet the requirements of my committee, I need your permission in order to include Franklin County Middle School and Franklin County High School in my proposal and data collection process. I understand that this approval is contingent on your receipt of HRB approval.

Please respond to this email granting me approval to conduct my research in your school district.

I would like to thank you in advance for your participation and support in this endeavor.

Sincerely,

Sheri Bradshaw

Ms. Bradshaw. you have permission to conduct your research at both the middle school and high school. Please share your results with me. Gary Steppe, Superintendent

Mr. Steppe,

I am currently working on my doctorate degree in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. My dissertation topic pertains to teachers' attitudes toward technology and their levels of integration in the classroom. I will also be looking at whether principals impact teachers' levels of technology integration.

In order to meet the requirements of my committee, I need your permission in order to include Stephens County Middle School and Stephens County High School in my proposal and data collection process. All information collected will be confidential except the name of the school.

Please respond to this email granting me approval to conduct my research in your school district.

I would like to thank you in advance for your participation and support in this endeavor.

Sincerely,

Sheri Bradshaw

Mr. Stephens,
>
> I am currently working on my doctorate degree in Educational Leadership at
> the University of Southern Mississippi in Hattiesburg, Mississippi. My
> dissertation topic pertains to teachers' attitudes toward technology and their
> levels of integration in the classroom. I will also be looking at whether
> principals impact teachers' levels of technology integration.
>
> In order to meet the requirements of my committee, I need your permission in
> order to include Union County Middle School and Union County High
> School in my proposal and data collection process. All information collected
> will be confidential except the name of the school.
>
> Please respond to this email granting me approval to conduct my research in
> your school district.
>
> I would like to thank you in advance for your participation and support in
> this
> endeavor.
>
> Sincerely,
>
> Sheri Bradshaw
>
Sheri,

I am pleased to give you permission to include Union County Middle School
and Union County High School in your proposal and data collection process
for your dissertation topic.

Much Success,
Tommy Stephens, Superintendent

WHITE COUNTY BOARD OF EDUCATION

113 North Brooks Street

Cleveland, Georgia 30528

www.white.k12.ga.us

Phone: (706) 865-2315 **Fax: (706) 865-7784**

Sherri,
This email will serve as verification that you are permitted to conduct research within the White County School System for the purpose of meeting dissertation requirements of the University of Southern Mississippi.

Tammy S. Mize, EdD
Assistant Superintendent of Personnel and Planning
White County School System
113 North Brooks Street
Cleveland, GA 30528
Phone: (706)865-2315
Fax: (706)865-7784
E-mail: tmize@white.k12.ga.us

Gilmer County Schools
497 Bobcat Trail
Ellijay, Georgia 30540

Dr. Raiford T. Cantrell
Superintendent
(706) 276-5000
Fax (706) 276-5005

Dr. Cantrell,

I am currently working on my doctorate degree in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. My dissertation topic pertains to teachers' attitudes toward technology and their levels of integration in the classroom. I will also be looking at whether principals impact teachers' levels of technology integration.

In order to meet the requirements of my committee, I need your permission in order to include Gilmer County Middle School and Gilmer County High School in my proposal and data collection process.

Please sign this letter granting me approval to conduct my research in your school district.

Sheri Bradshaw dvance for your participation and support in this endeavor.

Sincerely,

Sheri Bradshaw

Sheri Bradshaw

Approved
Raiford T. Cantrell

Note: Please FAX a copy to me at 706-276-5005

APPENDIX G

TEACHER EMAIL NOTIFICATION

January 3, 2006

Dear Sir or Madam:

I am currently working on my doctorate in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. As part of my degree requirements, I must complete a dissertation on a topic that is agreed upon by my dissertation committee.

In order to fulfill the requirements of the dissertation process, I am collecting data pertaining to teacher attitudes towards technology and their levels of integration into the classroom. I will also be looking at whether principals, as instructional leaders affect teachers' levels of technology integration into the classroom.

In approximately two weeks, you will be receiving a survey packet that is part of my data collection process. In order for my dissertation to be a success, I would greatly appreciate your participation in this process. Be assured that all information other than the school district will be anonymous.

I would like to thank you in advance for your participation and support in helping me complete this endeavor.

Sincerely,

Sheri L. Bradshaw
Assistant Principal, Towns County Middle School

APPENDIX H

COVER LETTER

January 10, 2006

Dear Sir or Madam:

I am currently working on my doctorate in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. As part of my research, I am analyzing a topic that is agreed upon by my dissertation committee.

I am collecting data pertaining to teacher attitudes towards technology and their levels of integration into the classroom. I will also be looking at whether principals, as instructional leaders influence teachers' levels of technology integration into the classroom.

In order for my dissertation to be a success, I would greatly appreciate your participation in this process. Be assured that all answers to questions will be anonymous. The only identifying information is school and district. Your participation is voluntary and may be discontinued at any time without penalty or prejudice. One year after the completion of the study, all raw data will be shredded and discarded.

In this packet, you will find the Perceptions of Computers & Technology instrument and a self-addressed, stamped envelope. Approximate time for completion of the questionnaire is 30 minutes. In order to complete this questionnaire, rate each item on a Likert-scale and complete demographic data. Please complete the instrument and return it to me at your earliest convenience. Results of the raw data will then be complied, analyzed, and reported.

I would like to thank you in advance for your participation and support in helping me complete this endeavor. If you have any questions or concerns, please feel free to contact me at 1-706-896-4131 ext. 1013.

Sincerely,

Sheri L. Bradshaw
Assistant Principal, Towns County Middle School

This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg,MS 39406-0001, (601) 266-6820

APPENDIX I

FOLLOW UP NOTIFICATION

March 4, 2006

Dear Sir or Madam:

I recently contacted you about participation in a study that is part of my degree requirements at the University of Southern Mississippi in Hattiesburg, Mississippi. Thank you for your participation in this process. Your support in this endeavor is greatly appreciated.

If you have not completed the survey packet, I would like to encourage you to do so. The information obtained from this process can be valuable in the development of professional development budgets and appropriate professional development courses. Again, all information other than the school district will be anonymous.

Thank you for your participation and support in helping me complete this endeavor.

Sincerely,

Sheri L. Bradshaw
Assistant Principal, Towns County Middle School

APPENDIX J
PRINCIPAL EMAIL

_____,

My name is Sheri Bradshaw, and I am the assistant principal at Towns County Middle School. I am currently working on my doctorate in Educational Leadership at the University of Southern Mississippi in Hattiesburg, Mississippi. As part of my research, I am analyzing a topic that is agreed upon by my dissertation committee.

I am collecting data pertaining to teacher attitudes towards technology and their levels of integration into the classroom. I will also be looking at whether principals, as instructional leaders influence teachers' levels of technology integration into the classroom.

_____ has given me permission to collect data at both the middle and high schools. In order to accomplish this task, I need to interview you and administer surveys to your teachers. The interview will be short in duration with approximately 5 questions. The surveys can be completed by your faculty at their convenience and mailed back to me. However, I am hoping to receive all surveys, at the latest, mid-February. Prior to administering the surveys to the faculty, I would like to notify them of the survey and its purpose. Is there a way I can send an email to all of your teachers?

If you are available, I would be very appreciative if I could conduct your interview on _____. However, I understand you are a very busy individual, and I am available at your convenience.

Please email or call me at _____ if this date and time is convenient for you. You can also contact me if you have any questions or concerns.

I thank you in advance for your support and participation with this endeavor.

Sincerely,

Sheri Bradshaw

APPENDIX K
PRINCIPAL INTERVIEWS

1. What do you think is the purpose of technology in the school curriculum?
   Response 1: The purpose is to make it where kids can do something when they get out of high school. If you don't have them computer literate, there are very few jobs walking out of school that they can do. There's no way they are going to be able to do anything in college unless they are able to handle the computer literacy part. It is just going to be a disaster for them.
   Response 2: Well I think it has several purposes. One, it helps teachers organize instruction in a way that some of them find very useful. They can organize most of their presentations, their plans, and the way they present their curriculum. I think presentation to students is a big deal with technology now. We all hear all of the brain research that talks about them being so stimulated by visual things. So a lot of the technology we use does address those issues and allows the presentations to be a little bit more jazzed up. More pizzazz maybe than before. We also use it to enhance when we are using things like streaming video and so forth. So, those are the things we use to supplement instruction.
   Response 3: In our case, I think that technology is definitely a tool. We don't want to have to rely on technology to be the actual deliverer of information. We want to be able to use technology as a tool, and that is the plan we have in place here at _____ County High School. Over the last three or four years, we have tried to increase technology in the classroom to help the teachers use different, like the Internet. We have a lot of projectors that can hook up to the Internet that they can use in the classroom. So we are pushing it as an instructional tool.
   Response 4: I think the purpose of technology in the school curriculum is to support instruction. It is not to take the place of textbooks. It is not to take the place of meaningful classroom interaction between the teacher and the student. One of its main purposes is to support instruction simple because we go for such long periods of time with textbook adoptions. Five to seven years to be exact. Technology gives teachers and student the opportunity to research more current facts, events, and statistics regarding our curriculum.
   Response 5: I think it is like any other instructional strategy or resource tool. I think there are times when it has an appropriate place. It is convenient for researching topics, for presentation of materials, for graphic organizers. I think it is also like any other instructional tool. Sometimes it is overemphasized. Sometimes it is underutilized. I think it just depends on the teacher what its degree of effectiveness is.
   Response 6: I think it is to prepare our children for the future and the jobs they will have when they graduate from high school and graduate from college. Many jobs today are technology oriented. Even as a car mechanic, technology is important.
   Response 7: Technology's purpose, well it is just like anything else in schools, it is to facilitate learning with the kids. It does not take the place of

anything as far as your teachers. But it is a good tool that they have. Technology is something that helps us individualize instruction because you can get on different programs and help those who are struggling in one area. At the same time, it can enhance students who are above where they are supposed to be. So, it helps a lot with individualization. But you have to be careful. You don't want to say, alright, you go get on the computer and have no purpose. It is a great instrument.
Response 8: To prepare students for their future adult lives. Also, to enhance and supplement our instruction.
Response 9: The purpose is to enhance the education process that we already have in place. Certainly as our society changes, technology changes, our society is more technology driven, it would be a disservice to our children to not incorporate it into our school system and into their instruction on a daily or weekly basis. They need to know how to use it. They do know how to use it often better than the adults who are working with it. I see it as a necessary tool that enhances and in some cases allows us to educate in a way that we have never been able to before.

2. In what ways do you believe that technology can be used as an instructional tool?
Response 1: We are already, and I am sure everybody else is, using it to remediate. We try to pull kids up to the right grade level and reading through technology. We try to remediate kids who have failed the graduation test or have done poorly on the End of Course test. We try to remediate kids that we have identified as not going to do well on the graduation test. So, we use it like that on a daily basis. We use it for kids who have failed courses to reclaim that credit rather than going to night school and paying $300 out of their pocket. We can just set them up with the same program during the day through something called NovaNet. So, we are using it that way. It is also used daily by teachers especially English teachers who are doing research for term papers.
Response 2: Well, here we use technology, and again for presentation of the lessons. Students also respond by doing things like PowerPoint presentations or Internet research. We also use some technology based remedial programs to enhance our instruction during the connections block. We use it to supplement in a very structured way.
Response 3: We just got through High Schools That Work grant and so we had some money we could put toward technology through that grant. Discussing with teachers and other faculty members about what would be most useful to them, the first thing that they came up with was that they wanted were the projectors where they could hook in to the computers and project on the screen in front of their kids rather than... We have TV's in every room but you've got 30 kids in a room and a little TV up there on the wall and not all of them can see. The teachers felt that the projectors with the big screens like in colleges when they use the PowerPoint and things like that. So they thought that the projectors would be the most useful thing right off the

bat. So, we tried to put in as many as we could. I think that at this time we have about 15 rooms that have projectors in the room. Not every subject area lends itself to that type of tool. So, we tried to focus on the subject areas that we could use it most effectively. That was the first thing that we did. Our system already had several years back committed to putting computers for every teacher in their rooms. Teachers already had computers in their rooms or teacher stations where they would do grade book and attendance. We have trained them on the Microsoft Suite, the Excel, and the Microsoft Word. They had already been trained on those aspects. We at the school level took it; we just want to go to it as an instructional tool. We do have some rooms that have computers in the classroom for student use, for research and things like that. Special Ed made a commitment. The county put a lot of computers in the rooms for our special Ed kids. So, most classrooms have 3 or 4 computers in the classroom for student use. The whole system has really dedicated itself to upgrading our technology. One of the other things that we have done at the school level, several little things, I don't know if you've seen the SmartBoards. We thought about doing that but we have tried ... we bought 10 of the little handheld portable... I can't remember the name of it now. But you can write on it and it shows up on the screen. You can put maps on there. It integrates with your computer. You can get on the Internet. You can walk around the room. You've got your tablet with you. The teacher can write on there and it shows up on the board. So, we have tried that. We haven't been real happy with the success of that because it is a little difficult to use. If you have ever seen it in use, it is hard to look at the screen and write. That's basically what they have to do. We had initially wanted to be able to use it in math, to be able to put graphs up there and they do that. We use it in science. But we are not getting the use out of it like we thought we would. The jury is still out on that one. But the projector and screens have been the most effective for us right now.

Response 4: Technology is part of the instructional bag of tricks that all teachers should try to incorporate in to their classrooms. Like I said, simply because you have more current, up-to-date data, knowledge, and information regarding topics that must be covered in the curriculum.

Response 5: The touch boards, the presentation of materials with PowerPoint. Using notes or graphic organizers. Certainly technology is a guide where you can have interaction with responses, check understanding with I don't know what the technical terms are, little clicks. We used to have them do thumbs up, thumbs down, or sideways. Now we have them click yes or no or whatever. So, I think there are lots of ways that technology can be incorporated. Obviously it can help with remediation.

Response 6: Everyday, everyday. The more we link technology to real life experiences, I believe they learn. If we just talk about technology and they do not get to use it, I think that does not benefit them in any way whatsoever.

Response 7: With individualization, it is a great thing. We are in the midst of trying to put together a couple of labs. We have rooms we have somewhat renovated. One purpose is to look at the High School Graduation Test. The

ones who are struggling, we are going to have a crash course. With the kids there, use online material. We are actually experimenting with a few virtual classrooms right now. They have the virtual learning centers. We are using some to learn Latin, microeconomics class. I don't know if there is an end to what you can do with it. I think we are just now beginning to start using it. It has been a novel tool. Now we are trying to make it efficient.
Response 8: To enhance our instruction. To supplement our instruction. It also prepares them for what they are going to see in their adult life.
Response 9: Of course we use it in those bookkeeping kind of ways. Teachers use it that way. We use it constantly. We have two labs. One of them is used for basic instruction; word processing and keyboarding. The other one is open for people to use for research. We use the Internet a lot for that kind of thing. They use the skills that they have learned in the other lab to do that. The other way, we have kids do PowerPoint, do presentations. They use them all the time for presentations. Not just in PowerPoint, but there are other things that they do as well. So, I think that we are using it in as many different ways as you can

3. To what extent do your teachers integrate technology into classroom instruction?
Response 1: Well the things I have mentioned, but there are other teachers who will use it throughout the building. It's scattered. A lot of times the teachers who will use it depends on how long they have been teaching. If they have been teaching a long time, they are probably not using technology as much because they did not learn that through their college courses. I noticed that younger teachers come out and they are far advanced in their technology. We use SmartBoards and things like that. The younger teachers have really bought in to. We are trying to fill out every teacher who wants one of those SmartBoards with one in a couple of years. Go in to the vocational and career tech classes and you find a lot of technology in use on a daily basis. They are preparing students to go out in to a career tech world, and in some cases, the career tech student, they have more technology background when they walk out the door than the college prep student. I think it's probably, I'd say in general terms that would be true. Auto mechanics is using technology down there on a daily basis. When those kids walk out the door, they know how to hook those cars up and use computers to tell what's wrong with the car. The drafting kids all use Autocat. We've got multimedia classes in the building that are using computers and all the things that go with that. A lot of it is not going on all over the building.
Response 2: Some teachers a great deal. There are some teachers, if we were a school like our new middle school will be where each room has projector in the ceiling, SmartBoards, and so forth; we have some who would just love every minute of it. If we had that available now, we would use it all the time. We have probably 15-20 % of our folks would just constantly use it. Probably another 50 would use it regularly but not to that extent. The other bit still has not caught on. We still struggle with responding to emails. But we do

have teachers who very comfortably use all of the technology and the video and bringing in things from every source. So, it is a mixed bag.

Response 3: I know that our English department has really pushed kids to start using technology, especially email. Email assignments to teachers that way they can email it at any time. Not all students have computers at home where they can do that, but our media center, we allow them to go in there and use those computers in the media center for that purpose. Of course, the Internet is available in every classroom through the teacher station or whatever student stations we have in there. Research is one of the bigger ways we use technology. We have allowed students to bring laptops in to the school. We have airports throughout the building so they can access the Internet whenever they need to. We do have a policy where the laptop has to be approved by our tech department because we don't want the viruses or whatever. If they don't have virus protection, that is a big thing we have to look for. We are starting to see a lot more kids bring in laptops and using those. Of course, typed papers, all the teachers are encouraging papers like essay papers to be turned in typed. We have even done our End of Course Tests over the Internet. So we are pushing; trying to get more technology in every aspect of what we are doing.

Response 4: I am very pleased to say that probably 90% of my teachers integrate some type of technology. They might not do it daily, but they at least do it weekly. We are fortunate enough to have our school set up where all the teachers have laptops. All of our classrooms with the exception of five have mounted projectors. We have at least one stand alone computer in each classroom. We still have one fully staffed computer lab that teachers can take their students in the computer lab to do some work. So, I feel very confident and comfortable saying that my teachers have taken a hold of the technology concept and have intertwined it in to their discipline. Like I said, it may not be on a daily basis but it is at least on a weekly basis. Some form of technology is used in the classroom.

Response 5: To the instructional side, I would say on a scale of 1 to 10, the little bit that I see I would give it a 3 on incorporating it in to the curriculum side. They use lots of it but it is more for maintenance. So far what I have seen at _____ County, it is more for curriculum enhancement. I would say we are a 3 on incorporating it in to the curriculum where students are using it like they would use maybe their paper and pencil.

Response 6: I guess it just depends who they are and where they are in their educational stance. I have brand new teachers who use it extensively. It's the development of teachers in general. You have 30 year teachers who it is like the first year over and over, and you have first year teachers who it is like they have been here for 30. Here I think, it is probably somewhere around 20-30% who use it extensively. There is a jeopardy game, there is a clicker, there is something technology oriented going on all day. Then I have that other 30% who integrate through the use of the grade book program. It's a widespread.

Response 7: We do not do what we should as far as utilizing it to the maximum because we have a lot of trouble with our computers. It's an old school, our wiring system is messed up. So, our teachers don't go to the labs often because we may have 38-30 computers in a lab, but 20-21 are working at a time until we fix them. They would like to use them. Of course, it is a great research tool. But I want them to get more involved with using it as a tool where you can enhance and remediate.

Response 8: Daily. Every student goes to a lab class every single day. They alternate "A" day and "B" day, math and reading/language arts. Also, our 8th grade math classes have the promethian boards which are interactive, installed in all the 8th grade classes. We hope to have that in our 7th grade classes next year because we are part of the 21st Century Technology Grant. They are also looking at making our whole school a wireless school. But every student goes to a lab class everyday. We have 13 computer labs in our school. Every classroom has at least 2-3 computers. We have the promethian boards. We have the white boards. In our vocational classes, our connections classes, our agriculture class is a lab class that uses computerized technology. Our career lab has modules which has computerized technology. We have a technology class. It is integrated in every class we have in some form. A lot of the money comes from grants. The 21st Century Project is coming from the state. Locally, the county also puts a lot of money into it. Obviously, they have 13 computer labs, you have to. We have technology district wide, and we have a technology director. Each school has its own technology assistant. So we have a lot of support district wide and from the state. Of course with our new facility, it was a good opportunity for the state to come in with the technology we already had available and supplement us. Our vocational class is one of our technology classes in which he does PowerPoint, he does the moviemaker. All of that is taught to the children. Plus teachers do it also in their classrooms. When they leave the vocational class, every student should know how to do a PowerPoint. This is nothing new to them because they have grown up in it. It is really exciting for them and for us too.

Response 9: It depends on the teacher. Some of our teachers are constantly using it. They use the computer, and they are way more comfortable, savvier than I am because I came out of the classroom right at the beginning of that into administration. But some of them use technology constantly in their classrooms. There are others who use it rarely. They go to the lab, mainly. Some of them use it all the time. It just depends on the teacher. I will say this...The number of teachers who were uncomfortable with technology is decreasing. When we first began to integrate technology in the classrooms here, we had some resistance at first. We are probably down to one person who is probably just completely uncomfortable. Everybody else has some comfort level in it anyway. Some people are very savvy, so it just depends on the teacher.

4. What are some things that impact (positive or negative) teachers' comfort level in integrating technology into the classroom?
Response 1: There comfort level is directly related to just how familiar they have been on their own. There's training offered, but a lot times people are just not going to jump in to the middle of training unless they have an interest already. So, they have to have something to perk their interest to get them to use the technology. The younger kids, like I said, are coming out of college already with that as part of their set of tools that they use in the classroom. It's that older group that has to have some sort of reason. They have to run across something. Something has to grab their interest for them to go back and try to figure out how to use it.
Response 2: Our younger teachers or teachers who have recently completed degrees where they had to work with technology are very much more comfortable. They have been able to serve as mentors to others. I think it is just exposure. No teacher wants to make an idiot of themselves in front of the classroom. Once they get to the point where they are comfortable enough with the technology then they enjoy using it. Probably by the same token, the biggest negative is being either afraid or uninterested in learning something new. Deciding they are too close to retirement or there is no need to mess with all of this modern stuff. The way we have done it before has been just fine for all of these years. But I really think to sum it up in both levels; it is how well they understand; how comfortable they are with the technology. Once they feel they have the training and enough experience and enough positive student feedback and those kinds of things, that's probably the guiding point. I have some teachers who have never tried technology until this year. Now, they fight for the equipment. So, it is a mixed bag.
Response 3: The first thing that you have is the learning curve for anything that is new. Change is always difficult. We have a lot of teachers who have been here for 30 plus years. They have always kept their grade book by hand. Being able to get that away from them and put it in to the computer, that is a little bit of a negative I guess you could call it. You can understand that. They are going to have problem with trying to change right here at the last minute. But once you train them, they tend to see the benefits of it. Our tech department has done a real good job of training all of our folks on PowerSchool. I know that you have started on PowerSchool too. I guess this is our fourth or fifth year on it, and teachers were reluctant at first. This is never going to work, blah, blah, blah. The attendance thing is not always good. I don't know if you have had the same experience as us. But just training them and having them have confidence in it has been a big hurdle. Other teachers come in to it, especially the younger ones, they're ahead of us. Coming out of school, they have already had to use computers extensively in college. Getting that influx of new teachers helps too because other teachers see what they are doing and that just kind of builds. That is always a plus. That has always helped us. The projectors and everything... they had seen it done. Just getting them use to setting up. Well, they don't even have to set up the equipment. We put them in the rooms and suspend

them from the ceiling. All they really have to do is turn them on. We try to make it as easy for them as we can. Doesn't always work but that is what we try to do. I guess the reluctance to change and just not having the training is the first problem. If we satisfy that, I think they are pretty open to it.
Response 4: The main positive thing is ease of use. If it is something that is going to be cumbersome, who would want to deal with it? Who would want to work with it? But if it is some type of gadget that is easy to use, easy for them to evaluate student achievement, easy for them to explain or demonstrate to students, then that would be a positive. They would be more incline to use technology or use that technological gadget in their classrooms. One negative and I know that this is not an instructional negative, but age. My veteran teachers and I have about 2 or 3 veteran teachers who have more than 15 years of service, are less inclined to use technology. They are willing to do it if they are shown and are able to work with their younger colleagues to learn some of the lingo. But I would probably say the age of the staff would be a negative.
Response 5: Student engagement I think is a large positive one. We are visual society now. So you can definitely bring in more interesting graphics. In my case someone who has poor handwriting, it is certainly a positive for me. Fourth period can read it as easily as first period because I am sick of writing it. So I think you will see some positives with that. You have more resources available at your fingertips. So, if you are in social studies and you want to fly over to Baghdad, get on Google Earth take that launch from Cleveland or just show them what downtown looks like. I think that we have all learned that its predictability is not comforting. Will it be working today? Will it be an internal problem? Will it be a BellSouth problem? How long will it resolve. I have a great lesson. Now I find out that I cannot make that link because maybe that server is not working on whatever I was going to tie in to the lesson. I think the biggest thing that is negative is how unpredictable it is. Will it be there? Will it not be working? Where your chalk is predictable.
Response 6: Immediate growth, immediate response from their students is a very positive thing for them. The other positive thing is that when there is training there is follow up. There is not well here is the training and there is no follow up. It is like, do you actual try that, did you do the video streaming, did you use that in your classroom rather than the people look at it that day and they never go back. One of the first thing there (negative impact) is the teachable moment. You've got the PowerPoint, and you have everything set up then some quirky thing happens then that negatively impacts. Let me give you an example. Yesterday was the last day of the first semester, and my two computer classes taught multimedia. Their exam was on the computer. The whole systems firewall crashed. So, their children are sitting there in front of the computers to take their final exams in that class, and they could not take it because the computers did not work. Sometimes that negatively impacts.
Response 7: They just have to become more proficient with it. The more you use it, the better off you are on anything. The old adage, if you don't know how to do something, it is always hard; if you know how, it is always easy. As

educators, we need to know how to use these things and not be afraid of them. We find that the kids are a lot more relaxed with technology than the teachers. That's an unfortunate thing, but it is the truth.
Response 8: They need the training, obviously. With the boards, they demonstrated to us what we could do with that. But of course, we had to have extensive training with the teachers during in-service or after school. Just workshops to prepare them how to use it. They knew what it was, and they liked it just from the demonstration. But they needed some guidance and training on all it can do for them and for the students. Teachers, especially veteran teachers, who haven't had a whole lot of training....New teachers coming out of college, it's just second hand with them. They know the answer; they know the technology and what's there. They know how to use it. They are excited about it. Veteran teachers, they have to be trained on it. They were used to the overhead projector and the chalkboard. But once they had that training, and they could see how we could do it better, and once they see that, they are on board. But you have to have that training which is crucial.
Response 9: A lot of it has to do with the age of the teacher, those who have had the least amount of experience with technology. We laughingly say that our kids know more. But that really is the truth because they have grown up with that technology that the teachers didn't. So that experience impacted them. Access to technology. For awhile, there was one computer for some many people. Now, every classroom has two, at least. Others have more than that. Of course, like I said, we have the lab. I think experience, opportunities, and access impacted them.

5. Could you explain some ways in which you integrate technology into your school?
Response 1: Well, I don't have to do a lot of it because those new teachers who are coming in are the ones who are generating that interest. Even some of those new teachers have shown that to the old teachers and brought them into it. The SmartBoards, we've got mobile labs all over the building to use. We can't have a one computer lab room because we don't have the space for it, and the county office doesn't seem to think that we need that many computers. So, what can I do to increase my test scores so kids can graduate high school? That's the way I have been using technology to get it into the building. I think we have advanced quiet a bit since I walked in through the door. I don't think that is necessarily me that has done that. I think that it is John Call at central office has done a lot of that to try to bring us up to speed, and Gary Hyde, the Curriculum Director, has been involved in technology and would like to see us take a step forward. As far as where we are compared to other schools, we are not where we need to be. There has been a lag in use of computers and technology, just technology in general, in the buildings in this county. I think we are trying to make up for that, so we are playing a little catch up. But we have all pushed real hard to do more than what we are doing.

Response 2: Two or three things. Just your basic... the software we use as far as student data, emailing, and those kinds of things. We use a program called I Path Maker which is a, it's not a data system as far as student records, but it's how we track our scores. It's a program we became involved in when we had a Quest grant for three years. So, we use that technology quiet a bit. That's the way we do all of our data graphing. We can put it in and do pretty much all we want to with it. We also use 20/20 program which we use to do surveys. Things like that to help use evaluate what we are doing with surveys against standards for quality schools. I use PowerPoint to do presentations to faculty.

Response 3: As an administrator, I use it. It's a great tool for communication. I can send an email to all of the teachers that quick. It's a great way to get news out to teachers quickly. Of course our campus is spread out over everywhere, and it would be hard to go around to every door. We have 50 or 60 classrooms we would have to hit, so that really helps. We use PowerSchool as our student management system. We also use PowerPoint in faculty members and any other type of staff development that we may have in-house. We try to model good use of computers so our teachers won't be so reluctant to use computers. But we always push it. I always ask them if there is anything out there we can get for you technology wise that will help. I know that in our science department we were able to get a camera that hooks to a microscope that is connected to the computer which goes to the projector. They can put a slide under the microscope and it shows on the projector what they are looking at. We don't have a lot of good microscopes. So if we just have one really good microscope, you can have a good lab without having everybody trying to do a slide. That's been pretty helpful too. Through Alltel and North Georgia Tech, we've got a video conferencing unit. We have Woody Gap which is our other school over in _____. We are able to, and we are just at the beginning of being able to do it, teach classes here and be able to video conference to their students. We are planning to really get started in the Fall. They are such a small school that they don't have all the teachers to be able to teach a lot of the subjects. They don't have a foreign language teacher. So, we are hoping to be able to teach Spanish to some of their students through video conferencing and some of the higher level courses that we have, science, and math. A little bit of a limitation because it lends itself to more of a lecture type course, board work, and that kind of thing. If you have a lab, that gets a little difficult with the differences in locations. But that is another thing we are trying to use, hopefully.

Response 4: Whenever we opened a couple of years ago, that was a number one priority to make sure technology was an integral part of the school. Each teacher has a laptop. About five classes do not have the data projectors. We are ever increasing the number of classes that have the interactive whiteboards. We are also exploring the option to purchase the classroom CPS. I do not know what that stands for. The clicker system. Whenever teachers go to conferences, whenever they go to workshops, they see new ideas or tricks they would like to incorporate in their instruction and

curriculum, to support what they are doing, we try our very best to invest in those items. I have to model. Myself in faculty meetings, a lot of my presentations are done through PowerPoint or using the data projector. I try to be a paperless principal. A lot of my correspondence is electronic. Probably the one area where I am not real comfortable, and that is due to the fact that I don't use it on a daily basis, is the use of the whiteboard. I have a number of teachers who are very savvy in the use of the whiteboard. That would probably be one area or one tool where I am not comfortable.

Response 5: Well certainly student data and record keeping and stuff like that. I do use it sometimes for presentations in faculty meetings for ideas or just organizing information. We use it as a communication tool which I think sometimes has become too easy and impersonal. Sometimes I think we have incorporated it when we don't need to. You have a question, and I just gave you a blunt no but you want to know more. So we don't have that personal interaction for me to see your face or recognize, hey, she really wants to know more than just the no or the yes to whatever.

Response 6: My teachers would laugh if they heard you ask me that question. I am not technology savvy. I don't do the dishwasher at my own house because there are too many buttons. But I think what I have to foster is that I let them laugh at me from my lack of technology skills. Say, don't be like me. I can say what do you need budget wise that I can give you in your classroom to increase your technology skills. Oh my gosh, I am so glad that they did not hear that questions.

Response 7: We are looking at doing some more programming with Channel 1 so we can get Character Ed in there. We use it with scheduling, discipline, looking up student information, or if I need to call parents. As administrators, we use it like that for the most part. What I would like to do is utilize it more with things like the SAT. We have this great tool that the Governor has put out, SAT Prep classes. We've got to get the schedules lined up so we can get licensed. I am realistic in thinking that kids will do it all after school, because they won't. So, we have got to utilize it more and in a smarter way too. So, I think we are touching the tip of the iceberg right now.

Response 8: For presentations to our faculty. Just about everything we do we use a presentation with PowerPoint. Part of my job is to make sure the teachers have whatever they want or need to use this technology in the classroom. It is really no good to have computers sitting there if you don't know how to use it to enhance your instruction. That's the main thing. It's just not to have it in there. You've got to know how to use it. To make sure we are using it to its fullest potential.

Response 9: I see my role as support. If they express a need for it, I need to help them get it. We have a good relationship and an excellent tech specialist here who stays on top of what the teachers' need. I have a really good relationship with teachers, so they come to me. We are pretty much bound by finances more than anything else. Because if they are interested in it, I look for a way to try to get that for them to be able to utilize. So, I see my role as support.

6. What are some specific things you do to support technology integration into classrooms?
   Response 1: I divert some of my instructional funds to the SmartBoards and things like that. If a teacher comes to me and has a technology idea, I try to make sure there is money to do that. If it is career tech, there is a pot of money they can draw on. They have a huge chunk of money that they can pull from. The other academic areas, I try to pull it in. I try giving laptops to the teachers. Well, we just set up a laptop for our literary team to use. So, we try to pull as much money and divert as much money into the technology instructional part of it as we can. That's what I do. Just make sure the money is there. If I don't have it readily available, I try to find the money to bring the technology in. It would be really nice if there was a computer lab in the building that we could go to for the NovaNet for the reclamation, for graduation practice, and all those things. As it stands now, we've got mobile labs that break down easily. They have to be recharged. They don't work as effectively as a stationary lab, but I am having trouble convincing folks that's the right way to go.
   Response 2: Probably just encourage. Trying to let teachers watch each other doing things. Let them see what works by training. The system has just hired a person to do teacher training with technology. We have had the tech aspect as far as going around and doing the work on systems and so forth. But we just got a person who will be training. So, we will be able to utilize that well.
   Response 3: I think the biggest thing is that when we had the money through the grant we talked extensively at faculty meetings about think about the technology you could use, is there anything we can get. Like I told you earlier, the first thing they wanted was the projectors. So we dedicated the money to that. I didn't want to force things on them and I didn't want to buy stuff we were never going to use. So, we kind of eased our way in to it over a period of three years. Just let them kind of get used to it, see the benefits of it. I use one of our teachers as kind of a guinea pig. He is very good with technology. I say, alright, I am going to get you this. Once you get good at it, I want you to show the other teachers. That worked real well. Started just kind of spreading throughout the faculty. That was kind of my way of doing it. You can't really force it on them or it won't be used. It will be wasted.
   Response 4: When teachers go to professional conferences and workshops, they bring back recommendations to me. If they can show the usefulness in assisting student instruction, then we work very hard to provide them with what they requested.
   Response 5: I try to put technical funding there because it is very expensive. We try to meet requests of those who genuinely want to incorporate technology for more than a time saver tool for themselves but as an instructional tool you are more likely to get a yes from me. If you need a new computer because you are going to be running some graphics in class with a projector, and I will just use Google Earth as an example, if your computer is more than four years old, it is not going to run. So, if you said, hey, I would

really like to use this in this class, I would be more inclined to try to make those resources available. With limited resources, I just think we have to be conscientious. These things have a shelf life. Replacements are part of it.
Response 6: If someone from technology comes to do training and they are here all day, I might not hit every one of those, but I try to be sure to go to at least one so they see me out there receiving training. Whether it is to set up CRCT online or anything that they might come to talk about, I want them to know that it is important enough to me to leave what is going on in this office and be there. Also, I think they come and want to order a jeopardy game, can we order this and can we order that, my job is to provide the budget so they can order.
Response 7: We have all kinds of department head meetings. Departmental meetings where we say you can do this. We are bringing bucks in from the state. Right now we are involved in a couple of things going on. One is the International Senate for Educational Leadership. Within that, they are trying to put out information to us. It is a program, I don't know if you are familiar with it. Bill Gates Foundation is a sponsor of it. I don't know if you are familiar with Dr. Dagen's work, but he is really into high school reinvention. The way we have done high schools we get about 50 percent more less who come through well and about 40 percent who don't do well. Well in the past, they would get a job at the mill. Mills aren't there, so we've got to do a better job of educating the kids. So Bill Gates and Dr. Dagen have gotten together and they are having an initiative right now that we are a part of. They chose 75 schools across the nation, and we are part of that 75 that's so-called "Promising Schools." It sounds real good, but it also means that we are not what we are supposed to be. But with that, they are giving us information. We can get all kinds of data from them. For example, if we wanted to ask if the start time of a school affect student learning. They would do a survey throughout the country and give it back to us. It's a resource that we are using, and you have to have technology skills to do that. The Governor's initiative to improve AP classes, the number that are taught and also the number of students that are in it.
Response 8: They have to see from the leadership that it is important to them also. They have to see us using it. Need to emphasize to them the importance of it. When something comes in, we are not afraid to try anything. If it is new and it's out there and we think it can make us a better school and makes us better teachers and administrators to help the children, then we are going to go for it. Technology changes constantly, so you have to make sure you are up-to-date on what's out there and what's new. Because every year, something new and exciting comes out.
Response 9: I am looking for the money. We look for grants to help do that. If we have money, then certainly if they express a need for it or explain to me how they can use it, then we look for ways to do that. I support training, staff development for them to get what they need. So, if they ask for it, if I can get it, I get it. That's the way it works. I don't stand in the way. I really do think that

the more we have and the more teachers are comfortable with it, the more the students will use and it benefits them more.

REFERENCES

A Plus Education Reform Act of 2000, HB 1187, (2000) (enacted).

Anderson, R. E., & Dexter, S. (2005). School technology leadership: An empirical investigation of prevalence and effect. *Educational Administration Quarterly, 41*(1), 49-82.

Aspey, S. (2003). $15 million in grants awarded to help states study technology's impact on student achievement. Retrieved February 5, 2006, from www.ed.gov

Barnett, H. (2001). *Successful k-12 technology planning: Ten essential elements.* Syracuse, NY: Eric Clearinghouse on Information and Technology. (ERIC Document Reproduction Service No. ED457858)

Barron, A. E., Kemker, K., Harmes, C., & Kalaydjian, K. (2003). Large-scale research study on technology in k-12 schools: Technology integration as it relates to the national technology standards. *Journal of Research on Technology in Education, 35*(4), 489-507.

Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education, 39*(4), 395-414.

Beck, R. B., Black, L., Krieger, L. S., Naylor, P. C., & Shabaka, D. I. (1999). *World history: Patterns of interaction.* Evanston, IL: McDougal Littell.

Belcastro, F. P. (2004). Rural gifted students who are deaf or hard of hearing: How electronic technology can help. *American Annals of the Deaf, 149*(4), 309-313.

Bernard, E. (n. d.). Technological change and skills development. Retrieved September 12, 2005, from www.law.harvard.edu/programs/lwp/eb/deakin.pdf

Blasé, J., & Blasé, J. (2000). Effective instructional leadership: Teachers' perspectives on how principals promote teaching and learning in schools. *Journal of Educational Administration, 38*(2), 130-141.

Blasé, J. & Blasé, J. (2001). The teacher's principal. *Journal of Staff Development, 22*(1). Retrieved February 10, 2006, from http://www.nsdc.org/library/publications/jsd/blase221.cfm

Burgstahler, S. (2002). Distance learning universal design, universal access. *Educational Technology Review, 10*(1), 1-17.

Burmeister, L. (2004). Leadership: It's all about relationships. Retrieved September 11, 2004, from http://www.findarticles.com/

Caudron, S. (2001, February). Evaluating e-degrees. *Workforce*, 80, 44-48.

Chambers, S. M., Hardy, J. C., Smith, B. J., & Sienty, S. F. (2003). Personality indicators and emergency permit teachers' willingness to embrace technology. *Journal of Instructional Technology, 30*(3), 185-188.

Choy, S. P., Chen, X., & Bugarin, R. (2006). *Teacher professional development in 1999-2000: What teachers, principals, and district staff report* (NCES 2006-305). U.S. Department of Education Washington, DC: National Center for Education Statistics.

Collier, C. (2001). Staff development for technology integration in the classroom. In J.F. LeBaron & C. Collier (Eds.), *Technology in its place* (pp. 61-71). San Francisco: Jossey Bass.

Collins. J. (2001). *Good to great.* New York: Harper Business.

Cosner, S., & Peterson, K. (2003). Building a learning community. *Leadership, 32*(5), 12-15.

Corcoran, T. B., & Wilson, B. L. (1986). *The search for successful secondary schools: The first three years of the secondary school recognition program* (Rev. ed.). Philadelphia: Research for Better Schools.

Cradler, J. (n. d.). Summary of current research and evaluation findings on technology in education. Retrieved September 10, 2005, from http://www.wested.org/techpolicy/refind.html

Cramer, S., & Smith, A. (2002). Technology's impact on student writing at the middle school level. *Journal of Instructional Psychology, 29*(1), 3-14.

Crawford, D. K., Bodine, R. J., & Hoglund, R. G. (1993). *The school for quality learning: Managing the school and classroom the Deming way.* Champaign, IL: Research Press.

Csikszentmihalyi, M. (2003). *Good business.* New York: Penguin Books.

Dalton, D. W., & Hannafin, M. J. (1988). The effects of computer-assisted and traditional mastery methods on computation accuracy and attitudes. *Journal of Educational Research, 82*(1), 27-33.

Daniels, H., & Bizar, M. (1998). *Methods that matter: Six structures for best practice classrooms.* York, MN: Stenhouse Publishers.

Davis, J., & Wilson, S. M. (2000). Principals' efforts to empower teachers: Effects on teacher motivation and job satisfaction and stress. *The Clearing House, 73*(6), 349-353.

Dawson, C., & Rakes, G. C. (2003). The influence of principals' technology training on the integration of technology into schools. *Journal of Research on Technology in Eduation, 36*(1), 29-49.

Dupagne, M., & Krendl, K.A. (1992). Teacher attitudes toward computers: A review of literature. *Journal of Research on Computing in Education, 24*(3), 420-429.

Ebmeier, H. (2003). How supervision influences teacher efficacy and commitment: An investigation of a path model. *Journal of Curriculum & Supervision, 18*(2), 110-141.

Education Online Search. (2005). Retrieved February 17, 2006, from http://www.education-online-search.com/

Encarta (2005). Retrieved October 11, 2005, from http://encarta.msn.com/

Enhancing Education Through Technology Act, 20 U.S.C. §2402 (2001).

Enhancing Education Through Technology Act, 20 U.S.C. §2413 (2001).

Ertmer, P.A., Addison, P., Lane, M., Ross, E., & Woods, D. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education, 32*(1), 54-71.

Fisher, S. C., & Dove, M. K. (1999). *Muffled voices: Teachers' concerns regarding technological change*. San Antonio, TX: Society for Information Technology & Teacher Education International Conference. (ERIC Reproduction Service No. ED432281)

Fiske, E. B. (1991). *Smart schools, smart kids: Why do some schools work?* New York: Simon & Schuster.

Fullan, M. (2003). *Change forces with a vengeance*. New York: RoutlegeFalmer.

Galowich, P. (1999). *Learning styles, technology attitude and usage: What are the connections for teachers and technology in the classroom?* San Antonio, TX: Society for Information Technology & Teacher Education International Conference. (ERIC Reproduction Service No. ED432312).

Georgia Department of Education. (2004). *Georgia teacher evaluation program: Evaluation manual.* Atlanta, GA: Author.

Georgia Department of Education. (2005). QCC standards & resources. Retrieved October 12, 2005, from www.glc.k12.ga.us

Georgia Educational Technology Training Centers. (2000). *Georgia framework for integrating technology in the student-centered classroom.* Atlanta, GA: Author.

Georgia Professional Standards Commission. (2006). Computer skill/technology course requirement. Retrieved February 28, 2006, from http://www.gapsc.com/TeacherCertification/SpecialGeorgiaRequirements.asp

Georgia Professional Standards Commission. (2006). Teacher certification section—special Georgia requirements. Retrieved October 11, 2005, from http://www.gapsc.com/TeacherCertification/SpecialGeorgiaRequirements.asp

Gonzales, E., & Short, P. M. (1996). The relationship of teacher empowerment and principal power bases. *Journal of Instructional Psychology, 23*(3), 210-215.

Gough, J. (Ed.). (1997). *Education sourcebook: Vol. 4*. Detroit: Omnigraphics.

Greshner, V. T., Snider, S. L., Huestis, A., & Foster, J. M. (2000). *Integrating technology at the pre-service teacher level: Examining the process of change*. Washington, DC: Department of Education. (ERIC Document Reproduction Service No. ED444536)\

Hasselbring, T. S., & Bausch, M. E. (2005). Assistive technologies for reading. *Educational Leadership, 63*(4), 72-75.

Hazzan, O. (2000). *Attitudes of prospective high school mathematics teachers towards integrating information technologies into their future teaching*. San Diego, CA: Society for Information Technology and Teacher Education International Conference. (ERIC Document Reproduction Service No. ED444539)

Hogarty, K. Y., Lang, T. R., & Kromrey, J. D. (2003). Another look at technology use in classrooms: The development and validation of an instrument to measure teachers' perceptions. *Educational and Psychological Measurement, 63* (1), 139-162.

Holland, L. (2000). A different divide: Preparing tech-savvy leaders. *Leadership, 30*(1), 8-12. Retrieved April 28, 2003, from Academic Search Elite database.

Iding, M., Crosby, M.E., & Speitel, T. (2002). Teachers and technology: Beliefs and practices. *International Journal of Instructional Media, 29* (2), 153-170.

Instructional Technology (n. d.). ISTE standards. Retrieved October 12, 2005, from http://www.atlanta.k12.ga.us/teachers/instructional_tech/itw/ISTE1.htm

ISTE NETS. (2005). ISTE national educational technology standards for students (NETS*S). Retrieved October 12, 2005, from http://cnets.iste.org/students/s_stands.html

Janas, M. (1998). Shhhh, the dragon is asleep and its name is resistance. *Journal of Staff Development, 19*(3). Retrieved October 12, 2005, from http://www.nsdc.org/library/publications/jsd/janas193.cfm

Johnson, D. (2001, October 29). Next frontiers. *Newsweek, 138*(18), 54-57. Retrieved June 30, 2003, from Academic Search Elite database.

Kanaya, T., Light, D., & Culp, K. M. (2005). Factors influencing outcomes from a technology-focused professional development program. *Journal of Research on Technology in Education, 37*(3), 313-329.

Kerka, S. (1994). *Life and work in a technological society*. Columbus, OH: ERIC Clearing house on Adult Career and Vocational Education. (ERIC Document Reproduction Service No. ED368892)

Lashway, L. (2002). *Developing instructional leaders.* Eugene, OR: ERIC Clearinghouse on Educational Management. (ERIC Document Reproduction Service No. ED466023)

Leh, A. S. C. (2000). *Teachers' comfort level, confidence, and attitude toward technology at a technology course.* San Diego, CA: Society for Information Technology & Teacher Education International Conference. (ERIC Document Reproduction Service No. ED 444492)

Lunenburg, F.C., & Ornstein, A. C. (2000). *Educational administration: Concepts and practices* (3rd ed.). Belmont, CA: Wadsworth.

Marcinkiewicz, H. R. (1994). Computers and teachers: Factors influencing computer use in the classroom. *Journal of Research on Computing in Education, 26* (2), 220-235.

Marshall, J., & Rossett, A. (n. d.). The learning community. Retrieved June 29, 2003, from http://www.electronic-school.com/0197f3.html

Marzano, R. J. (2003). *What works in schools: Translating research into action.* Alexandria, VA: Association for Supervision and Curriculum Development.

Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.

Maurer, M. M., & Davidson, G. (1999). Technology, children, and the power of the heart. *Phi Delta Kappan, 80* (6), Retrieved July 13, 2004, from http://www.pdkintl.org/kappan/kmau9902.htm

Maxwell, J. C. (1999). *The 21 indispensable qualities of a leader: Becoming the person others will want to follow.* Nashville: Thomas Nelson.

McBride, B. (2004). Data-driven instructional methods: 'One strategy fits all' doesn't work in real classrooms. *THE Journal, 31*(11), 38-39.

McDonald, K. K., & Hannafin, R. D. (2003). Using web-based computer games to meet the demands of today's high-stakes testing: A mixed method inquiry. *Journal of Research on Technology in Education, 35*(4), 459-470.

McGreal, R., & Elliott, M. (n. d.). Technologies of online learning (e-learning). Retrieved February 10, 2006, from cde.athabascau.ca/online_book/pdf/TPOL_chp05.pdf

McKenzie, F. H. M. (2000). Students' and teachers' perceptions of the relationship among the utilization of school-based (K-12) educational technology, student achievement and improved student learning. (Doctoral dissertation, The University of Southern Mississippi, 2000). *Dissertation Abstracts International, 62*(01), 42.

Medcalf-Davenport, N. A. (1998). *Historical and current attitudes toward and uses of educational technology.* Orlando, FL: WebNet 98 World Conference of the WWW, Internet and Intranet Proceedings. (ERIC Document Reproduction Service No. ED427721)

Mellencamp, A. V. (1992). *Making connections through voice: Teacher receptivity to change. Washington, DC: Special Education Programs.* (ERIC Document Reproduction Service No. ED365030)

Mills, S. C. (1999). *Integrating computer technology in classrooms: Teacher concerns when implementing an integrated learning system.* San Antonio: TX: Society for Information Technology and Teacher Education International Conference. (ERIC Document Reproduction Service No. ED432289)

Mills, S. C., & Tincher, R. C. (2003). Be the technology: A developmental model for evaluating technology integration. *Journal of Research on Technology in Education, 35*(3), 382-401.

Milone, M. (2000). Staff development: Getting it right the first time. *Technology & Learning, (21)*2, 58-61.

National Center for Education Statistics. (2002). *Public school district finance peer search, 2002-2003* [Data file]. Available from NCES Web site, http://nces.ed.gov

No Child Left Behind Act, 20 U.S.C. § 6301 (2001).

Nixon, M. (2002). How the web keeps parents 'in the know.' *The Journal, 29*(9), 58-59. Retrieved October 19, 2002, from Academic Search Elite database.

Peat, M., & Fernandez. A. (2000). The role of information technology in biology education: An Australian perspective. *Journal of Biological Education, 34*(2), 69-73.

Pellicer, L. O., & Anderson, L. W. (1995). *A handbook for teacher leaders.* Thousand Oaks, CA: Corwin Press.

Pritchard, R. J., & Marshall, J. C. (2002). Professional development in 'healthy' vs. 'unhealthy' districts: Top 10 characteristics based on research. *School Leadership & Management, 22*(2), 113-141.

Rebore, R. W. (2004). *Human resources administration in education: A management approach* (7th ed.). Boston: Pearson Education

Reiser, R. A., & Dempsey, J. V. (Eds.). (2002). *Trends and issues in instructional design and technology.* New Jersey: Pearson Education.

Reynolds, G. M. (2004). Using technology in education. *NCREL Viewpoints, 12*, 3-26.

Rodgers, C. (2005, December 4). Online degrees gaining acceptance, enrollment. *Eduexec*, 24, 4.

Ryan, K., & Cooper, J. M. (1998). *Those who can, teach* (8th ed.). New York: Houghton Mifflin.

Saidam, S. M. (n. d.). On route to an e-society: Human dependence on technology and adaptation needs. Retrieved September 10, 2005, from ssrc.org/programs/itic/publications/knowledge_report/memos/sabri.pdf

Salisbury, D. F. (1998). Stanford offering its first complete online degree program. Retrieved March 1, 2006, from http://www.stanford.edu/dept/news/pr/98/980724webdegree.html

Salomon, G., & Perkins, D. (1996). Learning in wonderland: What do computers really offer education? In Stephen T. Kerr & Kenneth J.Rehage (Eds.), *Technology and the future of schooling* (pp. 111-130). Chicago, IL: The National Society for the Study of Education.

Schlechty, P. C. (1997). *Inventing better schools: An action plan for educational reform.* San Francisco: Jossey-Bass.

Schmeltzer, T. (2001). Training administrators to be technology leaders. *Technology & Learning, 21*(11), 16-22.

Scoolis, J. (1999). Infusing your curriculum with technology. *Thrust for Educational Leadership, 28*(4), 14-16. Retrieved December 1, 2004, from Academic Search Premier database.

Scott, B. N., & Hannafin, R. D. (2000). How teachers and parents view classroom learning environments: An exploratory study. *Journal of Research on Computing in Education, 32*(3), 401-416.

Sewell, A. (2002). Constructivism and student misconceptions: Why every teacher needs to know about them. *Australian Science Teachers' Journal, 48*(4), 25-28.

Shaunessy, E. (2005). Assessing and addressing teachers' attitudes toward information technology in the gifted classroom. *Gifted Child Today, 29* (3), 45-53.

Sherry, L., Billig, S., Jesse, D., & Watson-Acosta, D. (2001). Instructional technology on student achievement. *The Journal, 28*(7), 40-43.

Sivin-Kachala, J., & Bialo, E. R. (2000). *2000 research report on the effectiveness of technology in schools: Executive summary.* Retrieved September 8, 2005, from www.siia.net

Slowinski, J. (2000). *Becoming a technologically savvy administrator.* Eugene, OR: ERIC Clearinghouse on Educational Management. (ERIC Document Reproduction Service No. ED438593)

Smerdon, B., Cronen, S., Lanahan, L., Anderson, J., Iannotti, N., & Angeles, J. (2000). A report on teachers' use of technology. (NCES 2000-102, pp. 1-28). Washington, DC: U.S. Department of Education.

Snowden, P. E., & Gorton, R. A. (1998). *School leadership & administration: Important concepts, case studies, & simulations* (5th ed.). New York: McGraw Hill.

Swain, C., & Pearson, T. (2003). Educators and technology standards: Influencing the digital divide. *Journal of Research on Technology in Education, 34* (3), 326-335.

Tenbusch, J. P. (1998). Teaching the teachers technology staff development that works. Retrieved April 30, 2003, from www.electronic-school.com/0398f1.html

The CEO Forum on Education and Technology. (1999). Professional development: A link to better learning. Retrieved February 10, 2006, from http://www.ceoforum.org/index.html

Thomas, L. G., & Knezek, D. G. (2002). Standards for technology-supported learning environments. *The State Education Standard, 3*(3), 14-20.

United States Bureau of Labor Statistics. (2003). *Occupational employment statistics.* Retrieved October 8, 2004, from http://stats.bls.gov/oes/home.htm

U.S. Census Bureau (2006). *Quarterly retail e-commerce sales.* Retrieved February 15, 2006, from http://www.census.gov/mrts/www/ecomm.html

United States Department of Commerce. (2003). *E-stats.* Retrieved February 14, 2006, from www.census.gov/estats

U.S. Department of Education. (2003). *Internet access in U.S. public schools and classrooms: 1994-2002* (NCES 2004-011). Jessup, MD: Author.

U.S. Department of Education. (2005). *New no child left behind flexibility: Highly qualified teachers.* Retrieved October 12, 2005, from http://www.ed.gov/nclb/methods/teachers/hqtflexibility.html

U.S. Department of Health, Education, and Welfare. (1961). Technology in American education, 1650-1900. Washington, DC: U.S. Government Printing Office.

Van Horn, R. (1999). The electronic classroom and video conferencing. *Phi Delta Kappan, 80*(5), 411-413.

Vannatta, R. A., & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology use. *Journal of Research on Technology in Education, 36*(3), 253-270.

Vroom, V. H. (1964). *Work and motivation.* New York: John Wiley & Sons.

Ward, A. (1997). Are you being serv'd? Retrieved June 29, 2003, from http://www.electronic-school.com/0397f5.html

Waxman, H.C., Lin, M., & Michko, G.M. (2003). *A meta-analysis of the effectiveness of teaching and learning with technology on student outcomes* (Government Contract No. ED-01-CO-0011). Naperville, IL: Learning Point Associates.

Wenglinsky, H. (1998). *Does it compute? The relationship between educational technology and student achievement in mathematics.* Princeton, NJ: Educational Testing Service. (ERIC Document Reproduction Service No. ED425191)

Wizer, D. R., & McPherson, S. J. (2005). The administrator's role: Strategies for fostering staff development. *Learning & Leading with Technology, 32*(5), 14-17.

Zepeda, S. J. (2003). *Instructional supervision: Applying tools and concepts.* Larchmont, NY: Eye on Education.

Zimmerman, I. K. (2001). Building public support: The politics of technology transformation. In J. F. LeBaron & C. Collier (Eds.), *Technology in its place* (pp. 99-111). San Francisco: Jossey Bass.