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Relationship between Principals' Technological Leadership and Their Schools' Implementation of Instructional Technology

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THE RELATIONSHIP BETWEEN PRINCIPALS' TECHNOLGICAL LEADERSHIP AND THEIR SCHOOLS' IMPLEMENTATION OF INSTRUCTIONAL TECHNOLOGY

by

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(Under the Direction of Professor Paul M. Brinson)

ABSTRACT

Despite the importance of technology, many principals ignore technology integration within their schools. Administrators commonly are proficient in technology for administrative purposes; however, they are deficient in areas of instructional technology. Therefore, that was the gap in which the researcher explored within this study. The purpose of this study was to investigate whether the technological leadership of a principal influenced the integration of technology within his or her school.

Two middle schools within a CSRA school district were examined in terms of principals' technological leadership and their schools' implementation of instructional technology. The principal, media specialist, and 7-9 teachers from each school were interviewed. The principal and media specialists were individually interviewed and the teachers were interviewed in the form of focus groups.

The results of the study provided evidence that the principals' leadership styles enhanced the utilization of technology within the school for instructional purposes. Both principals modeled their expectations and faculty members followed the lead of their administrator.

There was a relationship between principals' technological training and their school's implementation of technology. Principals must model practices in which they expect their teachers and students to replicate. Technology leaders at all levels must understand all of the

components within the educational system that are required to lead technology integration as an instructional strategy and assist in making technology a transparent tool in teaching and learning. A technologically competent leader has a greater tendency to pass on technology-related characteristics within his or her school. The transformation of integrating technology within the curriculum is everyone's responsibility but the primary responsibility resides with the school's principal being receptive and competent in the area of technology before its consistent implementation is visible within the school. Principal leadership is a vital factor that affects the effective use of technology in classrooms. When used properly, technology becomes an accelerator of momentum and makes learning more interactive and captivating for the average student. Principals must use that ideal to their advantage to not only prepare students for the 21st Century, but to enhance learning within the educational arena as is prescribed by local, state, and federal mandates.

INDEX WORDS: Technology, Instructional technology, Principal leadership, Technological leadership

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DEDICATION

This document is being dedicated to my family.

Thanks to my husband, Douglas L. Jackson, for his patience, support, sacrifices, and unconditional love.

Thanks to my children, Donovan D. Jackson and Drew D. Jackson, for their unselfishness and abundance of love.

I love you all so much!!!

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CHAPTER I

INTRODUCTION

Over the past 10 years, researchers, educators, and administrators have debated the value and effects of instructional technology in elementary and secondary schools. In spite of the conflicting results reported on the effectiveness of instructional technology in the K-12 educational environment, educational policy specialists and administrators have made a concerted effort to increase the presence of technology in classrooms (Kay, 2006). The principal is a key facilitator in the effort to infuse technology into the school; therefore, technology training for principals as well as for teachers should be a priority. According to Dawson and Rakes (2003), leadership that promotes change is the missing factor when it comes to merging technology and instruction as this was found in a 1997 study conducted by Merkley, Bosik, and Oakland. No matter how much training teachers receive to prepare them for technology integration, most will not successfully employ that training without encouragement from the principal (Dawson & Rakes, 2003).

The following statement was made in a study conducted by McCain:

> We are doing a really good job of providing education, but the kind of education we provide is increasingly irrelevant to the modern changing world in which we live, a world driven by four trends: global digital networks, technological fusion, emerging strategic alliances, and access to personal computers for everyone (Finn, 2006, 3).

In addition, Putt (n.d.) believes: "Technology is dominated by two types of people: those who understand what they do not manage and those who manage what they do not

understand." Today's principal must be able to understand technology in order to manage it properly.

Technology implementation in schools has shifted from the access stage to effective integration into the curriculum. As technology becomes an agent of change in school reform movements, the role of administrators changes from sideline spectator to active participant in technology integration. This role is of vital significance for the success of technology integration to be realized (Persaud, 2006).

Background of the Study

School principals of today must be leaders and managers of information and instructional practices. The traditional role of the building principal has been the manager, keeping the day-to-day events of the school running smoothly. The leader of an organization creates a vision for change and the manager plans and implements the details of that change. Today's principal must serve as both leader and manager and be prepared to support a change in school culture to sustain vision and facilitate the change process. As an instructional leader of the 21st Century, the principal is now required to play an integral role in technology integration.

The individual with the most direct influence on a school is the building principal. No successful large-scale change or school reform has advanced very far without the support of the leadership in the system that is most closely connected to those that need to change (Kozloski, 2006).

Instructional Leadership

According to the study performed by Wilmore and Betz in 2000, the principal's role is an important component to the success of technology integration. They summarize the success of technology integration by proposing that information technology will only be successfully

implemented in schools if the principal actively supports it, learns it, provides adequate professional development and supports his/her staff in the process of change (Kozloski, 2006). Wilmore and Betz further noted that leaders who are immersed in technology while they are studying theory are much more successful at understanding it and then placing it in the context of teaching and learning. Educational leaders must seek to understand, promote and implement the notion that technology integration is not just about technology; it is about focusing on future generations and leading teachers to a change in pedagogy to support these generations with 21st century teaching and learning strategies that increase student achievement (Kozloski, 2006). According to Langran (2006), the principal's role in technology decisions is essential in creating schools that effectively integrate technology. In other words, by evaluating teachers' use of technology in the classroom and modeling its proper use, principals create an expectation for technology integration in the classroom.

According to research, there are mixed views on the relationship between technology integration and student achievement. However, there are vast benefits to its usage, as federal, state, and city educational systems are continually instituting it within their programs. Within a study conducted by Judge, Puckett, and Bell (2006), access to a home computer, a computer area in classrooms, the Internet, and proficiency in computer use correlated positively with higher academic achievement. Two reports from the National Center for Education Statistics (NCES) emphasized the progress the nation has made over the last decade in technology access and highlighted the role of schools in achieving parity in computer and Internet access for children (NCES, 2006). The nation's continued investment in school-based technology has resulted in significant progress toward closing the digital divide. Studies conducted on the effectiveness of technology in the classroom often have mixed results, thus making it difficult for one to

generalize about the overall impact of technology in improving learning. The gap in access to computer technology is cause for concern if one assumes that academic achievement is facilitated by access to computers at home and at school. Digital equity is a social justice goal, ensuring that all students have access to information and communication technologies for learning regardless of socioeconomic status (SES), disability, language, race, gender, or any characteristic that has been linked with unequal treatment (Judge, Puckett, & Bell, 2006).

According to Persaud (2006), administrators are proficient in technology for data management and analysis and for administrative purposes. However, they are deficient in areas of instructional technology. The reason for this deficiency according to Persaud's study, was the lack of training. Based on the results of this study, it is not realistic to expect that principals and superintendents on their own will become trained in technology for instruction. The interviews indicated that unless they see technology as valuable and part of their leadership role they will not take time for training. In addition, Dawson and Rakes (2003) determined that the influence of a principal's technology training on the integration of technology within the school correlated significantly with actual technology utilization within the school. Using a survey, a study was conducted involving 398 principals from across the United States who were Internet users. They discovered that the amounts and types of technology training possessed by K-12 principals affected technology integration. In other words, the more technology training and/or experience attained by a school administrator, the more likely technology would be incorporated within the school (Dawson & Rakes, 2003). Consequently, staff development and other forms of technology training are vital in the preparation of educational leaders.

Technology Staff Development and Other Training

According to Kozloski (2006), technology staff development for educational leaders has been focused on skills needed for principals to use technology in a productive manner. These staff development programs have not been effective at helping building leaders see the need to move beyond productivity to innovation and instructional leadership for technology integration. In addition, staff development programs have also not been able to identify specific methods and strategies for technology leadership and how these may correlate to the current state of technology as it exists in their buildings (Kozloski, 2006). Understanding the needs of principals is key when it comes to strategic planning and the development of effective schools. According to a study conducted by Finn (2006), high school principals believe that significant needs exist in the areas of technology planning, support, and resources.

In instances where technology is properly supported and training is adequate for both principals and teachers, its utilization has been visible within school settings. According to Weber (2006), Texas elementary principals reported high level computer technology use, especially with the computer tools involving communication. Within that same study, a statistically significant positive relationship between principals' computer technology use and personal variables of training and perceived risk-benefit existed. For example, principals who used computers and personally took the initiative toward obtaining technology training viewed technology implementation as a benefit.

Although there are other explanations for the uneven impact of technology in school, many current efforts have assumed different results from a failure of leadership that can be resolved by providing better pre-service and in-service principal training. In Byrom and Bingham's 2001 study, it was found that lack of leadership and poorly trained administrators

were two primary reasons for the failure to fully integrate educational technology in the school (Weber, 2006). However, little attention has been given to training pre-service and in-service administrators in technology. Despite the lack of attention and training, administrators continue to face increased responsibilities of infusing technology into their schools (Weber, 2006). According to Telem in 1993, with training there is the possibility of principals using instructional technology as an aggressive educational leadership tool and proactive management tool. According to Schmeltzer's 2001 study, many technology courses offered for school administrators have emphasized skills-based training that show administrators how to use presentation, spreadsheet, and database software rather than how to assure that technology is used to support instruction. School administrators may have the basic skills to use technology successfully in their daily on-the-job activities, but they may not have had training regarding the effective integration of technology in classroom instruction (Weber, 2006). To address the need for technology implementation training for school administrators, the Collaborative for Technology Standards for School Administrators (TSSA) led an initiative to develop and document a national consensus on what PK-12 administrators should know about and be able to do to optimize benefits of technology use in schools (NCES, 2005). Ertmer, Bai, Dong, Khalil, Park and Wang's study found that there is very little research delineating best practices for preparing administrators to be technology leaders thereby acquiring their technology knowledge on the job or from occasional training by vendors, professional organizations and in some cases, colleges and universities (Kozloski, 2006).

Statement of the Problem

Technology is a tool that has the potential to empower educational leaders at all levels—whether they are superintendents, principals, or teachers. Technology allows for the

dissemination of accurate information and advanced communication capabilities. Technology has the ability to improve management and operations, as well as improve instructional methods. Administrators benefit from understanding and competently using technology as they manage and set priorities for a school or even a school district. Experience as a hands-on user helps administrators understand the change process that students, teachers, and staff must undergo when integrating technology. Effectively utilizing technology also empowers administrators to manage large amounts of information and make data-driven decisions.

However, research is limited in measuring administrators' technological training. In addition, research is limited in measuring administrators' technology use, and the actual percentage of administrators who require and/or actively integrate technology within their respective schools, in spite of national, state, and local mandates.

Therefore, the purpose of this qualitative descriptive study was to examine how principals' technological leadership contributes to the implementation of technology in their school. The overarching question was this: What is the relationship between the principals' technological leadership and their schools' use of instructional technology? To guide the study, the researcher responded to the following subquestions:

1. What is the personal assessment of two middle school principals in a Central Savannah River Area (CSRA) school district regarding their technological leadership?
2. What do media specialists of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
3. What do core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?

4. What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?

Significance of the Study

School systems are facing increasing pressure to use technology to enhance learning, teaching, and administration. Principals are expected to be the leaders in this endeavor. Technology usage is highly encouraged within the educational setting. The typical educational budget was designed to accommodate technological needs (i.e. training, equipment, and other support) of the school. As a result of the overwhelming attention being given to educational technology, it is vital to ensure that principals are trained and competent in its usage within their schools, so that they can pass on that knowledge to their teachers and students. Technology integration has the potential to improve teaching strategies as well as learning practices.

The practical significance of this study was to assist in the determination of whether principals' technology training positively affects the implementation of technology within the school. Some of the practical problems that currently exist include the lack of appropriate training for principals. If principals are not trained to use technology, chances are that it will not be used or it will not be used optimally to support instruction. Therefore, one of the intentions of this study was to identify the significance of technological training for school administrators as one of the remedies for successful educational technology implementation. Competency with technology is one of many skills that is essential within our technology-oriented society and educators must be competent in this area in order to teach and pass on those skills to their students.

The professional significance of this study was to establish the concept that providing administrators with sufficient technology training, both in pre-service and in-service settings,

would ultimately benefit the classroom. This study would be of benefit to Georgia Southern University and other institutions that offer educational leadership programs. Although the data gathered was from only one very small area of the United States, the information generated can provide useful data for departments of education, school districts, and administrator preparation programs to develop strategies that assist principals in their acquisition of knowledge and skills regarding technology in schools.

The policy significance of this study was important as a result of the existence of the requirements of the educational technology division under the No Child Left Behind Act. In addition, all Georgia educators are required to satisfactorily master a computer competency test in order to maintain their certification. This information can help policy makers, who are designing technology integration training, develop appropriate training for principals.

The personal significance of this study was two-fold: (1) as a business education teacher for seven (7) years who taught computer concepts daily, the researcher understood that the utilization of technology was crucial to functioning efficiently within society, and (2) the researcher found that as an administrator that it was imperative that school leaders work smart and use any and all tools that have been proven to improve/expedite learning and administrative tasks. Therefore, the findings of this study would benefit the educational sector, current and future administrators, as well as the researcher.

Definitions of Terms

For the purpose of this study, technological leadership was defined as the concept of providing adequate guidance, support, and resources in the area of technology. Technological leadership was explored in the following two areas: the use of technology in schools and principals' influence upon the use of technology.

Delimitations of the Study

The following aspects were delimitations of the study:

1. Only the principals of Burns County were assessed.
2. The small number of respondents limited the generalizability of the study.
3. This was an exploratory study, designed to discover relationships among the variables rather than investigate cause-effect relationships.

Procedures

The initial step was to request permission from the Superintendent of Burns County School System to secure the data needed for this study (see Appendix A). The next step was to obtain research permission from the Georgia Southern University Institutional Review Board (IRB) (see Appendix D). Following approval of the superintendent, the middle school principals, teachers, and media specialists within the school system were interviewed (see Appendix B). The next step was to review the data received from the individuals participating in the interviews. The final research step was to analyze the data, and it is from this data that the researcher was able to formulate conclusions to determine the relationship between the principals' level of technological leadership to their schools' actual implementation of instructional technology.

Research Design

For the purpose of this research, a descriptive study using qualitative inquiry methods was implemented. Interview data was used to obtain information on the influence of principals' technological leadership upon the integration of technology within the curriculum. According to Gay and Airasian (2003), a descriptive survey determines and describes the ways things are. In the case of this study, data was obtained using interviews.

Participants

This investigation specifically sought descriptions and explanations of integrating technology from middle school principals, teachers, and media specialists. The participants within the study included 2 principals, 2 media specialists, and 16 core teachers (7 teachers from School #1 and 9 teachers from School #2) within two middle schools of Burns County. Therefore, the number of participants was 20.

Sampling

The researcher randomly selected two of the ten middle schools within Burns County for the purpose of this study. The researcher placed the names of all the middle schools in a hat and withdrew two names. The principals and media specialists were selected for this study using a convenience sample. The teachers were selected using random purposeful sampling. A random purposeful sample is defined as a group of cases that are selected by random sampling methods for the purpose of establishing that the selection of the cases was not biased (Gall, Gall, & Borg, 2007). The teachers were selected purposefully by the researcher to ensure all academic areas from various grade levels were represented. It was the researcher's goal to obtain teachers' responses using the focus group approach.

Instrumentation

The researcher devised interview questions for the principals and then different interview questions for teachers and media specialists (see Appendix B). The principals' interview questions sought after input regarding principals' technological training, the use of technology in schools and principals' influence upon computer usage. The media specialists' and teachers' interview questions sought input regarding the use of technology in the school and principals' influence upon technology usage within each school.

Data Collection

Interviews are used extensively in educational research to collect data about phenomena that are not directly observable: inner experience, opinions, values, interests, and the like. They also can be used to collect data about observable phenomena more conveniently than by direct observation (Gall, Gall, & Borg, 2007). The researcher interviewed all participants and all interviews were recorded and transcribed.

Data Analysis

After data responses were reviewed, the data was analyzed, and it is from this data that the researcher was able to formulate conclusions. The researcher used a category system to analyze data. The researcher used grounded theory principles and the method of constant comparison to compare entries within and across categories (Gall, Gall, & Borg, 2007). This allowed the researcher to generate constructs, themes, and patterns to form the categorical data.

The researcher organized the qualitative interview data. Within the principals' interviews, questions 1-2 measured each principal's technological training. Interview questions 3-5 measured the principals' personal/professional use of technology. Interview questions 6-11 measured the principals' influence upon technology integration.

The media specialists and teachers were asked the same interview questions. Within the interviews with the media specialists and teachers, interview questions 1-4 measured technology use within the school and interview questions 5-7 measured principals' influence upon technology integration.

Research question one (What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?) was analyzed to produce findings regarding the two principals' views regarding their technological training, their

personal/professional technology use, and their influence upon technology integration within their schools. Research question 2 and research question 3 (What do media specialists/core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?) was analyzed to produce findings regarding the actual use of technology in schools and principals' influence upon technology integration. Research question 4 (What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?) was analyzed to produce findings of whether there was a relationship between what the principals perceived to be occurring in their school in terms of technology verses what their media specialists and teachers identified is commonplace in the school in terms of technology. In other words, the researcher was able to determine if there was a relationship between technology leadership and technology integration for each individual middle school.

Summary

The transformation of integrating technology within the curriculum is everyone's responsibility but the primary responsibility resides with the school's principal being receptive and competent in the area of technology before its consistent implementation is visible within the school. It is imperative to utilize technology and its capabilities to its fullest potential in order to progress within global society.

The integration of technology is not a new concept, but it has now become a requirement of every school system within the United States through the National Technology Education Plan. Principals must take on the primary responsibility of its implementation within their schools in order to provide students with the particular technological knowledge base that will benefit them in many aspects of their lives and this task possibly may require more technological

training of school personnel—but specifically from the school's principal. A technologically competent leader has more of a tendency of passing on technology-related characteristics within their school.

Therefore, the purpose of this study was to examine how principals' technological leadership contributed to the integration of technology in their school. This study was conducted within the Burns County School System, as two of the county's middle schools' principals, media specialists, and teachers were examined within the area of their individualized technology usage and training. Discovering the relationship between principals' technological leadership and their schools implementation of technology was the ultimate objective of this study. Despite noted benefits of technology to students, teachers, and administrators, its actual implementation is often ignored. Therefore, this study was intended to identify whether there was an actual relationship between leadership and actual implementation. In addition, this study was significant, as it added an additional knowledge base within the educational arena in the area of educational technology.

CHAPTER II

REVIEW OF LITERATURE

Not since television has a single technological advance had a greater impact on daily life and educational environments than computers. The huge infusion of technology in classrooms gives students access to computers to assist in their learning process. In the past, every typical family owned a television. In the 21st Century, the typical family has numerous televisions and a computer in the home. People entering the workplace must be competent in computer usage. According to Salpeter (2003), learning in educational settings needs to be relevant to real-life. As a result of preparing students for real-life, they should be prepared for the technological world in the classroom through the use of integrating technology within the curricula. Effectively using technology means rethinking almost every facet of education. The integration of technology in education is no longer a new idea. Because technology has become such an integral part of society, it is necessary to integrate its use in education in a variety of ways. Computers can be used as tools to create instructional materials or as presentation devices to provide information in ways never before possible. Improving teacher performance and student learning can be amplified through an increased understanding and use of technologies. Administrators also gain benefit from the use of technology in forms such as in monitoring student achievement and accommodating individual needs. The technology that has so dramatically changed the world outside our schools is now changing the learning and teaching environment within them. This change is driven by an increasingly competitive global economy and the students themselves who are born and comfortable in the age of the Internet (Thomas, 2005). However, in order for teachers and students to fully reap and perceive the benefits of technology integration its usage must be supported and modeled by school administrators.

An emerging body of literature documents the effectiveness of computer integration in the educational setting. Information in this review of literature has broad implications for a larger population of educational administrators.

As a result of preparing students for real-life, students should be prepared for the technological world in the classroom through the use of integrating technology within the curricula (Duhaney, 2001). Many school districts and universities fail to provide proper training for school administrators and teachers (Wetzel & Zambo, 1996). It is quite difficult for an educator to teach students to use a tool in which the educator is incompetent. Technology integration must be implemented in a meaningful practical manner in order for its benefits to be realized, which requires appropriate resources and administrative support.

Significance of Technology Integration

According to Goddard (2002), computer technology can provide a number of different instructional environments that allow for a variety of learning styles. According to Swan and Mitrani (1993), studies have been done that prove that computers can change the nature of teaching and learning at its most basic level—the level of interactions between students and teachers. Student-teacher interactions tend to be more student-centered and individualized during computer-based teaching and learning than during traditional teaching and learning.

According to Yamagata-Lynch (2003), businesses and other organizations throughout the world have been made more efficient because of their better application of technology. As a result of technology taking an increasingly critical role in our society, American educators have become accountable for preparing technology-literate students as indicated in the No Child Left Behind (NCLB) Act (2001). Consequently, there have been pressures from the business sectors and the government for schools to prepare technology-literate future citizens. However, because

of the organizational constraints in schools, teachers have faced limited technology support, which has hindered them from infusing technology into their curricula. Colleges and universities must shape their educational leadership programs in a manner in which the curriculum is relevant and current. School districts should also increase the amount of technology training specifically designed for school administrators that focuses on infusing technology into the curriculum (Mullen & Cairns, 2001). Technology integrated curricula can be maintained long-term through the aid of administrative support (Hill, 1999). School leaders, and aspiring school leaders, must be taught how to incorporate technology within the classroom because their skills in the area of technology will carry over into their respective schools. The challenge of integrating technology has proven to be less of a hassle when principals are committed to implementing technology and voice their commitment in terms of supporting the innovation and their teachers (Staples, Pugach, & Himes, 2005). According to Foster (2004), findings support the growing recognition that competent administrative and teacher leadership contribute to school success and reinforce leadership as a shared social influence process.

Technology Education Legislation

The United States Department of Education's Office of Educational Technology (OET) resides in the Office of the Secretary of Education and its core purpose is to maximize technology's contribution to improving education. OET develops national educational technology policy and implements that policy department-wide supporting the goals of NCLB and other initiatives (Office of Educational Technology, 2006a).

The portion of the NCLB Act known as Enhancing Education Through Technology Act of 2001 (E2T2) has a goal: To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade,

regardless of the student's race, ethnicity, gender, family income, geographic location, or disability. The primary goal of the Title II, Part D (Enhancing Education through Technology) program is to improve student academic achievement through the effective use of technology in schools and to encourage the effective integration of technology through teacher training and curriculum development to establish successful, research-based instructional methods. Title II, Part D maintains that school systems will spend 25 percent of all funds from this program on high-quality professional development for teachers (Georgia Department of Education, 2004).

Educator proficiency is one of the seven essential components under the National Technology Program. Access to technology alone does not ensure effective instructional or administrative use of technology. Such outcomes depend on a workforce that is proficient and comfortable using technology to support learning. There are currently five national standards for teachers and administrators: (a) designing, implementing, supporting, and evaluating effective learning experiences supported by technology, (b) designing and implementing curriculum plans that include applying technology to maximize learning, (c) applying technology to facilitate a variety of effective technology-supported assessment and evaluation strategies at the classroom, school, and system level, (d) using technology to enhance professional productivity and practice, and (e) understanding the social, legal, and ethical issues related to technology use and applying that understanding to practice. In addition, national standards for administrators include: (a) inspiring a shared vision for comprehensive integration of technology, (b) fostering a culture conducive to the realization of that vision, and (c) ensuring the integration of technology to support productive systems for learning and administration (Georgia Department of Education, 2004). Funded through NCLB, Georgia provides grants to local educational agencies on the basis of their proportionate share of funding under Title I, Part A. The Georgia Department of

Education considers this a local control issue to be defined by each district (Georgia Standards, n.d.)

NCLB requires the Secretary of Education to update a national long-range technology plan based on an assessment of the continuing and future needs of the nation's schools in effectively using technology to provide all students the opportunity to meet challenging state academic standards. The plan highlights seven action steps that states, districts, and schools can take to evaluate their use of technology to improve student achievement (Office of Educational Technology, 2006b). The seven action steps include (a) strengthen leadership, (b) consider innovative budgeting, (c) improve teacher training, (d) support e-learning and virtual schools, (e) encourage broadband access, (f) move toward digital content, and (g) integrate data systems (U.S. Department of Education, 2004).

As a part of state school reform legislation, House Bill 1187 (A Plus Education Reform Act) was passed in 2001. Georgia educators were required to demonstrate competency in the area of technological ability through a test approved by the Professional Standards Commission (PSC) or through a PSC-approved course, such as In-tech. Every educator of Georgia must have demonstrated this competency by June 30, 2006. Noncompliance of this requirement resulted in the educator's certification not being renewed and an electronic block was placed on the certificate. If the certificate expired because an educator was unable to satisfy the competency requirement, the school system had the option of requesting a waiver for one year (Georgia Professional Standards Commission, 2004). The only state approved test of computer skill competency was Georgia AccessOnline, which measured educators' technological skills in six areas to include (a) Windows operating systems, (b) word processing, (c) spreadsheets, (d) databases, (e) presentation tools, and (f) internet navigation. An educator's overall score must

have been at least 175 (with the maximum score being 300) in order to meet this requirement (Georgia Professional Standards Commission, 2001).

The State of Georgia's Technology Integration Goal is: Technology will contribute to increased student achievement of core academic and technology integration standards in the Quality Core Curriculum (QCC) (Georgia Department of Education, 2004). Objective four of The State of Georgia's K-12 Technology Plan is to increase educators' proficiency to use technology effectively to enhance student learning and business operations in elementary and secondary schools (Georgia Department of Education, 2004). Educators will use technology to enable new ways of implementing instruction and accessing learning, develop instructional strategies targeted toward needs, and enhance their professional skills and knowledge (Georgia Department of Education, 2004).

Georgia is leading the country in the use of technology in education, according to a national report. Georgia was the only state to receive an "A" in the annual "Technology Counts" report released by Education Week on March 29, 2007. The report scores states in the following three areas: access to technology, use of technology, and capacity to use technology (Tofig, 2007). In addition, Georgia is one of very few states that have technology requirements for teachers and administrators seeking certification or recertification. Compared with other states, the following statistics apply to the state of Georgia:

1. It is 1 of 45 states to include it in teacher standards.
2. It is 1 of 36 states to include it in administrator standards.
3. It is 1 of 19 states to include it in initial teacher-license requirements.
4. It is 1 of 9 states to include it in initial administrator-license requirements.
5. It is 1 of 9 states to include it in teacher-recertification requirements.

6. It is 1 of 5 states to include it in its administrator-recertification requirements (Technology Counts, 2007).

The Burns County School System has many technology goals to enhance learning for all students as well as to increase knowledge and skills for teachers and administrators. Several technology-related gaps have been identified, such as access to technology, instructional uses, administrative uses, and communication. However, the school system has several tactics in place to bridge this technological gap within the county (Georgia Department of Education, 2008).

Instructional Technology and Technology Leadership

According to The Association for Educational Communications and Technology (AECT) Definitions and Terminology Committee, instructional technology is defined as the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning. Instructional technology is a growing field of study, which uses technology as a means to solve educational challenges, both in the classroom and in distance learning environments. While instructional technology promises solutions to many educational problems, resistance from faculty and administrators to the use of technology in the classroom is not unusual. This reaction can arise from the belief, or fear, that the ultimate aim of instructional technology is to reduce or even remove the human element of instruction. Most instructional technologists however, would counter with this claim that education will always require human intervention from instructors or facilitators. In the education industry, the terms instructional technology and educational technology are often used interchangeably (Ely, 2008).

Principals are being admonished to be "instructional leaders" without much clarity about what that means. In addition, there is very limited research that examines how instructional supervision works to influence teacher in-classroom behavior and attitudes toward student

learning that in turns may affect student achievement levels (Glanz, Shulman, & Sullivan, 2007). Having a technology leader properly certified will ensure that instructional technology is implemented and supported properly (Lesisko & Wright, 2007). The requirement for a single individual to do conduct all aspects of instructional technology is not realistic. According to Lesisko and Wright (2007), the most obvious solution is to hire two people, one being a systems manager with significant technical training and background, and the other individual being an educator with a specialization in educational technology supervision and leadership. The lack of technology integration stems from a lack of confidence by the educator. Well-trained educators do not hesitate to provide technology experiences for their students. Administrators and teachers have to be trained in curriculum and methods. If technology is not apart of the curriculum and methods program, then it will be viewed as "extra". Curriculum supervisors, superintendents, and administrators who are not technologically prepared do not expect results from teachers using technology.

Technology utilization is unavoidable within today's educational environment and therefore, it is imperative to have educators who are technologically competent. The principal's role has become increasingly complex. Even though most principals bring a strong sense of purpose to their work and welcome challenges, contemporary educational leaders definitely need to utilize technology to its fullest potential. School administrators and teachers are increasingly relying on sophisticated technology systems to provide support and service in completing their daily tasks in schools (Mullen & Cairns, 2001). A myriad of tasks associated with operating a school has been integrated into the school's instructional and administrative functions. Regardless of an administrator's level of technological competence, it is her/his duty as an effective leader to channel personal ego needs away from himself or herself and into the larger

goal of the institution. Their ambition is first and foremost for the institution, not themselves (Collins, 2001).

The National Center for Education Statistics (2005) indicates that principal leadership has been described as one of the most important factors affecting the effective use of technology in schools. Principals who are knowledgeable about technology and technological issues are important advocates for the integration of technology into schools. Administrative support is crucial in determining whether or not teachers would integrate technology. Research supports that when administrators offered their teachers emotional and moral support by showing interest in changes the teachers instituted in their classrooms that favorable results were evident. In addition, by working with their staff to create a shared vision for the future, effective administrators eased tensions among teachers and fostered teacher collaboration rather than competition (Kincaid & Feldner, 2002). In their study, Abbott and Faris (2000) noted that when student teachers were provided instruction and exposure to technology it was credited for increasing positive attitudes towards computers that resulted from instructional approaches, meaningful assignments requiring technology, and a supportive faculty.

Technology Preparation in Higher Education Institutions

School districts and universities must increase the amount of technology training specifically designed for its aspiring school administrators that focuses on infusing technology into the curriculum. In order for public education to benefit from the rapidly evolving development of information and communication technology, leaders at every level—school, district, and state—must not only supervise, but also provide informed, creative, and transformative leadership for systematic change. Leadership in this area can be strengthen by investing in leadership programs to develop a new generation of tech-savvy leaders at every level

and by retooling administrator education programs to provide training in technology decision making and organizational change (U.S. Department of Education, 2004). Georgia Southern University's College of Education has adopted Reflective Educators for Diverse Learners as its theme for its conceptual framework within its educator preparation programs. There are four commitments that makeup this framework: (a) commitment to the knowledge, skills, and disposition of the profession, (b) commitment to diversity, (c) commitment to technology, and (d) commitment to the practice of continuous reflection and assessment. Georgia Southern University's philosophy pertaining to its commitment to technology is to recognize the critical role of technology in all facets of the educational process, thus providing all candidates with experiences that allow exploration of a broad range of technologies. Initial and advanced teacher education candidates integrate technology and other multimedia resources to maximize learning opportunities for all students (Georgia Southern University, n.d.). Many teacher education programs have integrated technology experiences into professional educational courses (Duhaney, 2001). In their 1996 study, Wetzel and Zambo found that colleges of education might be tempted to avoid the issue of placing student teachers in classrooms where technology was used interactively. However, such experiences are critical during student teaching because student teachers are likely to adopt the beliefs and practices that provide student teachers with exposure to and practice using technology in student teaching. Despite the challenges encountered in integrating technology in teacher education programs, a number of institutions are successfully preparing teachers who are competent in using technology to accomplish teaching and learning objectives (Duhaney, 2001). This is a very significant step, particularly within this study, because ultimately some of those teachers will pursue advanced careers within the educational arena and bring that knowledge base with them into their own schools as leaders.

According to Staples, Pugach, and Himes (2005), principals bring along with them the skills and knowledge that were attained throughout their careers and they tend to implement and support learning techniques with which they are most familiar.

Technology Standards for Administrators

According to Foster (2004), principal leadership is an important factor that affects the effective use of technology in classrooms. Moreover, principals who are knowledgeable about technology and technological issues are important advocates for the integration of technology into schools. As a result, administrative support is crucial in determining whether or not teachers would integrate technology. The principal's role in technology decisions is essential in creating schools that effectively integrate technology. By evaluating teacher's use of technology in the classroom and modeling, principals create an expectation for technology integration in the classroom. By building leadership in others, principals and technology coordinators contributed to a distributed leadership model to sustain change despite shifting personnel. Truth is a component that is also important as it increases opportunities of risk-taking and the likelihood of innovation implementation while reducing the sense of overload (Langran, 2006).

According to the National Center for Education Statistics (2005), standards for administrators generally focus on their role as leaders in enhancing learning and school operations through the use of technology. Standards established by national organizations and state education departments often represent a consensus among educational stakeholders regarding what measures can best assess effective school leadership as it affects the comprehensive use of technology in schools.

The following sets of standards, referred to as the Technology Standards for School Administrators (TSSA), has been published by a broad coalition of national principal,

administrator, and school board organizations. It provides a basis for assessing administrator technology competency.

I. Leadership and Vision:

Educational leaders inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision.

II. Learning and Teaching:

Educational leaders ensure that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching.

III. Productivity and Professional Practice:

Educational leaders apply technology to enhance their professional practice and to increase their own productivity and that of others.

IV. Support, Management, and Operations:

Educational leaders ensure the integration of technology to support productive systems for learning and administration.

V. Assessment and Evaluation:

Educational leaders use technology to plan and implement comprehensive systems of effective assessment and evaluation.

VI. Social, Legal, and Ethical Issues:

Educational leaders understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues (National Educational Technology Standards for Administrators, 2005).

Technological Changes and Barriers

American education is being bolstered by the increasing use of educational technology, greater accountability, and growing new partnerships between tech-savvy students and teachers. There are several components of NCLB, but the integration of technology is an aspect that requires consistent implementation of school administrators and faculty to stimulate student learning. Research has proven that the use of technology within the classroom exposes students to a variety of perspectives, which enhances students' overall learning experience.

When used properly, technology becomes an accelerator of momentum, not a creator of it (Collins, 2001). Integrated, interoperable data systems are the key to empower educators to transform teaching and personalize instruction. However, states, districts, and schools must establish a plan to integrate data systems so that administrators and educators have the information they need to increase efficiency and improve student learning, use data from both administrative and instructional systems to understand relationships between decisions, allocation of resources and student achievement, ensure interoperability, and use assessment results to inform and differentiate instruction for every child (U.S. Department of Education, 2004). At least 15 states provide some form of virtual schooling to supplement regular classes or provide for special needs, and about 25 percent of all K-12 public schools now offer some form of e-learning (electronic learning) or virtual school instruction (Thomas, 2005).

Leaders cannot make a series of good decisions without first confronting the brutal facts of reality (Collins, 2001). Lack of training, equipment, time, and support are all possible circumstances of reality that possibly can prohibit the smooth transition to a state of greatness in educational technology. However, the key is to consider the Stockdale Paradox, which is a concept, that stresses the importance of retaining faith and prevailing in the end regardless of the

difficulties and confronting the most brutal facts of current reality, whatever they might be (Collins, 2001).

While technology has traditionally been seen as a positive influence on education, many have also noted the potential dangers of inequitable access as well. If students cannot have access to the same tools and become as fluent in using those tools as their peers, technologies may actually deepen rather than relieve social disadvantages (Georgia Department of Education, 2004). Change, complexity, and uncertainty are dominant characteristics of the environment to which organizations today must nimbly adapt.

A growing body of literature addresses the need to find new and better ways to lead under unstable and unpredictable conditions that confront organizations. Essentially, the leader in these circumstances is confronted with the need to deal with two very different kinds of problems—technical and/or adaptive. Problems confronting schools today, particularly problems of school reform are clearly adaptive problems and require adaptive leadership concepts and techniques (Owens, 2004). According to Kozloski (2006), schools are currently doing well at using technology and applying it as an instructional strategy but their weakest link is having the necessary infrastructure, which includes the people, funds, and resources to do so. Further, three themes about what changes as a result of technology integration were mentioned: (a) changes in the education environment, (b) more support at all levels, and (c) a commitment for the future (Kozloski, 2006). The principals who felt the strongest about these themes were those who use technology regularly in their daily professional and personal lives. Educational leaders must seek to understand, promote and implement the notion that technology integration is not about the technology, but instead is about focusing on future generations and leading

teachers to a change in pedagogy to support future generations with 21st Century teaching and learning strategies that increase student achievement (Kozloski, 2006).

Staff development and other training are often used to introduce or expose educators to desired concepts. However, implementation is a key domain for the principalship in the integration of technology into the operation of the school. Staff development programs often fail because not enough attention is given to implementing the program once it is designed and scheduled. However, many professional development opportunities are in the form of one-time seminars and are insufficient to bring the teaching profession up to speed with emerging technologies. Only 12 or fewer states currently require technology-related professional development for teachers, technology training for initial administrator licensure, and technology-related professional development for administrators. Such data suggest that states consider policies, procedures, and resources directed to technology-related staff development and improving technology support (Georgia Department of Education, 2004). Problems arise when actual support, particularly from the principal, and follow through are inadequate, when the unit of operation is the school district rather than the school, and when the time provided for acquiring new skills is not sufficient. Problems such as these are eliminated when principals involve the faculty in program planning and evaluating post-training performance, and when the principal encourages and arranges for school faculty to serve as trainers and leaders (Clark & Denton, 1998). In their study, Dawson and Rakes (2003) determined that the principal's technology training had a direct influence upon the integration of technology within the school. Using a survey, they conducted an experimental study involving 398 principals from across the United States who were Internet users. Researchers discovered that the amounts and types of technology training possessed by K-12 principals affected technology integration. In other

words, the more technology training and/or experience acquired by a school administrator, the more likely technology integration was incorporated within the school.

A report released by the Partnership for 21st Century Skills advocates that in order to cope with the demands of the 21st Century, people need to know more than core subjects. They need to know how to use their knowledge and skills-by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, and making decisions (Partnership for 21st Century Skills, 2003). A digital divide based less on economics than on leadership and community support exists when it comes down to technology-related issues. According to the Consortium for School Networking (CoSN) (n.d.) research, while 38 percent of school leaders report increases in their technology funding, 33 percent are experiencing funding decreases, with more than half of these decreases being described as *significant* (Salpeter, 2006).

Administrators, teachers, and school district officials must work collaboratively to develop curricula that would increase the use of technology across the various courses. It is a brutal fact that provisions within the NCLB have to be met, including those of the National Technology Education Plan. As a result, educators will be held accountable to its stated provisions. Interventions that may increase technology integration are (a) adequate technology equipment, (b) proper training of equipment usage for administrators and teachers, (c) district/state regulations that require its implementation (i.e., House Bill 1187 that requires all educators to become technologically competent), and (d) administrative support. The success of educational technologies ultimately depends upon the acceptance of teachers, who generally enjoy the autonomy of choosing the tools they use in their classrooms, and administrators who support its implementation within the classroom. Litigation often occurs when a school system's

views regarding academic freedom are not in congruence with a teacher's perception of autonomy in determining specific subject matter for a particular class, appropriate teaching methods, or the selection of appropriate materials. Although courts have recognized that teachers have the right to academic freedom, as with other constitutional rights, it is not absolute and must be balanced against the competing interest of the larger society (La Morte, 2005). Technology is a larger part of education than ever before, and as a result administrators are spending billions of dollars each year on hardware and software. Digital technologies have not only gained increases in school budgeting, but in training and administrative routines as well. Nine out of every ten schools in the country have access to the Internet, and schools have an average of one computer for every six students (Staff of Education Week, 2000). In fall 2005, nearly 100 percent of public schools in the United States had access to the Internet, compared with 35 percent in 1994. The ratio of students to instructional computers with Internet access in public school was 3.8 to 1 in 2005, 4.4 to 1 in 2003, and 12.1 to 1 in 1998 (National Center for Education Statistics, 2006).

Margaret Honey, Vice President and Director of Education Development Center's Center for Children and Technology stated that "unfortunately, in the schools that have the most pressure on them to improve test scores, technology often takes a back seat, along with the arts or anything that is seen as peripheral" (Salpeter, 2003, Technology's Role Today Section, ¶ 2). According to Gonzales, Pickett, Hupert, and Martin (2002), the Regional Educational Assistance (RETA) program provided professional development opportunities for teachers and administrators to improve teaching performance, educational leadership, and student learning through increased understanding and use of learning technologies. The finger of responsibility must point to supervisors and administrators, even if they delegate to a curriculum committee or

group of teachers. Principals are not always formally assigned the task of technology leader. Other individuals such as technology coordinators, media specialists, and others may be charged with this responsibility; however, the principal should be actively involved within the process. The results of the study conducted by Langran (2006) indicated that technology coordinators within the explored school division had roles that varied greatly across schools, which cause problems. Thus defining the role of a technology coordinator is essential.

Some educators, such as computer guru Seymour Papert, and the author of the book *Growing Up Digital* (1998), Don Tapscott, have presented the notion of schools as an "outdated locomotive", chugging through a high-tech landscape. In short, most existing approaches to teaching and learning are incompatible with recent developments in the computer/digital age. Both teachers and students must be connected to information technology, informed by it, enriched and empowered through it, and use it in their educational environments on a regular basis. Money should not be an excuse. School districts with limited budgets need to find creative ways for enhancing information and electronic literacy by pooling resources on a regional basis; developing partnerships with nearby libraries, colleges, and universities; seeking advice and assistance from local, regional, and national computer companies; and finally, requiring all teachers and administrators to upgrade their technological skills on a regular basis (Lunenburg & Ornstein, 2004).

According to Ertmer, Addison, Lane, Ross, and Woods (1999), integrating technology in schools, like any other significant change, requires systematic planning. Furthermore most educators have little background and even fewer resources with which to conduct the necessary type of planning. Educators and others must think critically about computers in the classroom. Technological advances, especially in the use of technology, are an ongoing endeavor.

In their 1999 study, Ertmer et al. examined the relationship between first- and second-order barriers to technology implementation by surveying, observing, and interviewing several teachers within a single school who had achieved varying levels of integration. Researchers discovered that first-order barriers (i.e., lack of equipment, time, training, and classroom help) were experienced by all teachers while second-order barriers (i.e., beliefs about teaching and learning, preferable instructional methods, lack of relevance, mismatch with classroom management style, and lack of confidence) were mentioned by teachers who used computers as a supplement to the curriculum. Barriers to change were the extrinsic and intrinsic factors that affected a teacher's innovative implementation efforts.

According to Hill (1999), problem-centered activity based approaches emerge for creating learner-centered environments for teaching computer technologies to teachers and students. This method promotes the idea of allowing individualized learning, as opposed to mastery learning, that supports the notion that progression is not made within the classroom until the majority of the students have satisfactorily met the requirements of the concept.

Technological Culture

School administrators, alternatively referred to as technology leaders, must establish and become advocates for the purpose of the philosophy that includes the vision, mission, values, and beliefs. The technology leaders must insure access and productivity by breaking down barriers and driving out fear of technology. They must realize that achieving quality can only be accomplished when schools reconsider how students learn and teachers teach. Therefore, schools must adopt new paradigms of teaching and learning, and develop different methods of evaluation that includes conceptualizing the role that technology tools will play.

Transformational leadership is concerned with the process of how certain leaders are able to inspire followers to accomplish great things. This approach stresses that leaders need to understand and adapt to the needs and motives of followers. Transformational leaders are recognized as change agents who are good role models, who can create and articulate a clear vision for an organization, who empower followers to achieve at higher standards, who act in ways that make others want to trust them, and who give meaning to organizational life (Northouse, 2004).

It has been reported that administrators within a district in Texas have recently used palmOne handhelds to assist them within their numerous administrative tasks. The administrators carry the handheld instruments and are able to move about their schools with student and teacher information easily at their disposal. A student's class schedule, grades, attendance, and contact information can quickly be obtained without much effort. Administrators can advise on the run—not having to use their office as frequently for disciplining and advising students. Teacher documentation is also maintained on the palmOne. The advantage of this tool is that it allows for better and more precise documentation using programs such as ePrincipal and MVAL to assist in immediate and quick decision-making situations (Jenkins, 2004). The demands of excessive paperwork are taking precious time, money, and attention away from education nationwide at the expense of academic achievement among students.

Proper planning is essential in the execution of an effective integration system. Principals believe that significant needs exist in the areas of technology planning, support, and resources (Finn, 2006). Findings also revealed that some administrators are proficient in technology for data management and analysis and for administrative purposes. However, they

are deficient in areas of instructional technology. Based on the results of this study it is not realistic to expect that principals and superintendents on their own will become trained in technology for instruction (Persaud, 2006). A large amount of planning, resources, and leadership is built within the notion of integrating technology, and requires the continual use of proper planning, adequate resources, and supportive leadership to keep the implementation moving along a productive direction.

A technologically based curriculum tends to have the following features: (a) more specific and less general, (b) more complex and less linear, (c) more visual and less verbal, (d) more administrative driven and less teacher centered, (e) more interactive and less unidirectional, and (f) more global and less parochial. A curriculum designed for technology emphasizes a means-end orientation. The starting point is to identify goals and then all that matters is designing the means to accomplish those goals. Numerous studies have concluded that integrated curriculums have resulted in better achievement and improved attitudes toward schooling (Brandt, 2000). As mentioned above, the role of an administrator within a technologically based curriculum is to lead the way by institutionalizing a logical and consistent system of technology within the school.

President Harry Truman summed up the heart of the administrative process in the famous slogan he kept on his desk in the Oval Office: "The Buck stops here." Ultimately, administrators must make and be responsible for decisions. The ability to make decisions is the most important single ingredient of administrative and supervisory behavior. Administrators must be able to sense when they can fulfill the desires of their followers for immediate decisions and when they should suspend judgment until more facts are available. Administrators who render snap judgments and call them correctly will certainly gain status. On the other hand, once

they start to make bad decisions and suffer unpleasant consequences, they can plummet in the eyes of their followers (Oliva & Pawlas, 2004).

Technology Usage Within the Data-Driven Decision Making Process

Educational administrators constantly analyze data and make decisions based upon reasoning and/or research. By applying and integrating technology into the day-to-day functions, administrators, educators, and students are better prepared for the 21st Century. Computer proficiency for administrators is mandatory in order to automate tasks to best facilitate the needs of students. The leadership of a system must determine when and how to incorporate the emerging practices around technology into the culture of the system. School leaders must understand the need for a particular change related to technology before attempting to set it into motion (Rudd, 2006).

The mere presence of computers within a school does not denote that teachers and students have access to actually use the computers. If computers are not located in a particular classroom, then the teachers and the students in that class may be incapable of utilizing the schools' technology effectively for learning. By placing a resource outside of the normal working space of teachers and students it makes it more difficult to integrate computer activities with the other instructional and learning activities going on in the classroom. On the other hand, when computers are located in a teacher's class, technology integration may be problematic because not having a computer for each student in the class will make it more difficult to coordinate activities for an entire class of students (Anderson & Ronnkvist, 1999).

The National Educational Technology Standards (NETS) for administrators, developed through the Technology Standards for School Administrators (TSSA), identifies knowledge and skills constituting the "core" of what every P-12 administrator needs to know and be able to do

with technology regardless of specific job role (National Educational Technology Standards for Administrators, 2005). As one of the components of the National Technology Plan under NCLB, leaders are expected to embrace, support, and implement technology integration within the classroom through their personal understanding and usage within their positions.

Data-driven decision making—or as it is often called, DDDM OR D3M—is referenced in nearly all educational reform and accountability issues. This drive to gather meaningful, usable data has been compounded by accountability requirements set forth under NCLB, which calls for increased accountability, data collection and analysis and more rigorous reporting requirements. Data-driven decision making can be a powerful tool for continuous improvement. Technology makes it possible to gather, connect, analyze and share information quickly in order to make sound decisions regarding education (Consortium for School Networking, n.d.).

There are currently numerous technological tools within the educational sector. However, personal digital assistants (PDAs) are now used in the schools by administrators to assist with administrative and disciplinary matters. At McKinley Technology High School in Washington, D.C., PDAs are turning out to be more effective than hall monitors. The PDAs enable administrators to search student schedules and determine whether an individual hanging out in the hallway actually belongs in algebra class and whether he or she has been involved in any fights or other disruptions that day. All devices have access to the same information, which empowers school officials by providing this type of consistency. When a student disruption occurs, an administrator can pull up pertinent information on the spot without leaving the scene of the encounter. The system also can be programmed to issue alerts after a designated number of incidents with the same student, and reports can be generated anytime, sorted by student, time, or type of problem. The mobile data system has proven to be beneficial for this school as it now

has fewer truancy and incident reports than other nearby schools (Derringer, 2006). This tool equips the administrators with access to important data instantaneously, which allows the administrator to make better data-driven decisions. Not only are PDAs (handheld computers) useful in disciplinary matters, but also they are useful in data analysis for school improvement (i.e. student achievement). The miniaturization of technology is spreading to school districts throughout the country. Educators must learn to use these resources to tap into the multiple intelligences of their students and help them meet state and national standards (Bell, 2006). According to Weber (2006), elementary principals involved within a study reported high level computer technology use, especially with the computer tools involving communication. In addition, the study revealed a significant positive relationship between principals' computer technology use and personal variables of training and perceived risk-benefit.

School principals must use knowledge derived from educational research to assist in their decision-making. Principals with more professional education were more likely to respect, know about, and use research knowledge—which supports the fact that principals should seek out more professional training and spend more time reading and thinking about the challenges faced within the educational sector (Biddle & Saha, 2006). Moreover, educational technology research has proven to yield many benefits. Technology can help on the administrative side by providing tools for collecting and managing data, assessing learning, documenting activities, disseminating information, and enhancing research productivity. Technologies such as handheld data-collection devices, Global Position Systems (GPS), and assistive technologies have been integrated within some schools (Lessen & Sorensen, 2006).

John Q. Porter, Montgomery County's (Rockville, Maryland) Assistant Superintendent, spearheaded the creation of a state-of-the-art data management system. The system, Integrated

Quality Management System (IQMS), allows data to move from one department or program to another, which allows everything from tracking student grades to teacher performance to occur. For example, in reviewing teacher performance, the system has the ability to create professional development for each individual teacher and administrators are able to correlate instruction and see what professional development program(s) teachers are in need of—which is imperative to the accountability factor that exists within educational improvement plans. According to Mr. Porter:

> There's not enough time in the day: our enemy is time and technology is the only way to combat that. You have to have a staff that understands technology. There's a level of technology every superintendent needs to know, a basic understanding they should have. I think there are some superintendents who don't understand the importance of technology. I think also the level that technology people are in, in some districts, is too low. It should be a cabinet-level (Esposito, 2006, 52).

Administrators must utilize all tools that assist in school improvement. Research supports the fact that technology improves instructional conditions—that is why educational technology departments exist within school systems and that is also why a National Technology Plan exists. Within our technologically advanced world, a clear understanding of technology is crucial. To improve educational conditions, data must be analyzed and decisions must be made—both tasks, which can be managed promptly with the use of technology. Time cannot be wasted—administrators must use technology maximally to yield benefits for the educational arena.

Technology Leadership and Technology Integration

The intended purpose of this study was to determine the relationship of technology leadership and technology integration within two middle schools of the CSRA school district. In a study of the correlation between teachers' perceptions of principal's technology leadership and the integration of educational technology, Rogers (2000) found that teachers who had positive perceptions about the principal's role in supporting the integration of technology were more likely to integrate technology themselves.

In a case study of three urban elementary schools, Staples found that the more closely the technology is connected to the curriculum, the smaller the barrier to integration. She further argues that it is important for the principal to understand the complexity of technology and set the tone for the goals and progress of technology integration (Staples, 2005).

According to Ertmer, Bai, Dong, Khalil, Park, and Wang (2002), administrators' ideas about technology integration and technology leadership changed while participating in a semester-long online professional development course. Pre- and post-course surveys indicated significant changes in ideas about technology integration as well as methods used to support teachers' integration efforts. In addition, the study revealed that administrators view technology leadership as a "shared responsibility" that requires both administrative skills and technical knowledge.

Schools experience difficulty connecting technology infrastructure with effective leadership in order for students, faculty, staff, and the community to reap the benefits from technology. Despite the fact that administrative leadership may be the single most important factor affecting schools' successful integration of technology, surprisingly little attention focuses on the technology-related needs of school administrators (Dikkers, Hughes, & McLeod, 2005).

While a strong infrastructure will be necessary to initiate technology into the school culture, strong leaders will be necessary to promote and sustain it. Abundant access and ongoing training will not lead to effective use if teachers are not encouraged, or expected, to use computers in meaningful ways. Without a doubt, strong leadership is critical (Anderson & Dexter, 2000).

Concluding Thoughts

Without question, it is important for students to be taught and led by educators who are technologically competent. However, the transformation of integrating technology within the curriculum is everyone's responsibility but the primary responsibility resides with the school's principal being receptive and competent in the area of technology before its consistent implementation is visible within the school. It is a proven fact, that when technology is integrated within the curriculum, student achievement improves, which in turns reflects that students are better prepared to function efficiently within a technology-driven society. It is imperative to utilize technology and its capabilities to its fullest potential in order to progress within global society.

School leaders must become technology leaders. They must articulate and model the technological mission, vision, values, and beliefs of their school and district. They must also drive the technology plan by providing opportunities for teachers and students to achieve the plan's goals and objectives. In addition, they must demonstrate excitement and interest in technology while modeling the behavior expected from teachers and students. Most importantly, school leaders must realize that her/his role in technology growth is to be responsible for technology development and implementation within the educational environment (Richardson, Blackbourn, Ruhl-Smith, & Haynes, 1997).

The integration of technology is not a new concept but it has now become a requirement of every school system within the United States through the National Technology Education Plan. In order for this technology plan to reach its fullest potential, or in other words, in order for this plan to be great, it will take the involvement of everyone—principals, teachers, students, board members, parents, and community members. However, principals will have to take on the primary responsibility of its implementation within their schools in order to provide students with the particular technological knowledge base that will benefit them in many aspects of their lives. This task may possibly require more technology training for school personnel—but specifically from the school's principal. A technologically competent leader has more of a tendency of passing on technology-related characteristics within their school.

CHAPTER III

METHODOLOGY

As a result of preparing students for real-life, they should be prepared for the technological world in the classroom by integrating technology within the curricula. Many school districts and universities fail to provide proper training to school administrators and teachers in this particular area. It is quite difficult for an educator to teach students to use a tool in which the educator is incompetent. Technology integration must be implemented in a meaningful practical manner in order for its benefits to be realized and as a result requires appropriate resources and administrative support.

Technology is a tool that has the potential to empower educational leaders at all levels—whether they are superintendents, principals, or teachers. Technology allows for the dissemination of accurate information and advanced communication capabilities. Technology has the ability of improving management and operations systems, as well as improving instructional methods. Administrators benefit from understanding and competently using technology as they manage and set priorities for a school or school district. Experience as a hands-on user helps administrators understand the change process that students, teachers, and staff must undergo when integrating technology. Effectively utilizing technology also empowers administrators to manage large amounts of information and make data-driven decisions.

However, the concept of technology integration has not been studied in depth to discover the specific needs and training of principals. In addition, research is limited in measuring administrators' technology use, their leadership behaviors, and the actual percentage of administrators who actually request and/or actively integrate technology within their respective schools, in spite of national, state, and local mandates.

Despite the importance of technology, many principals ignore technology integration within their schools. Administrators commonly are proficient in technology for administrative purposes; however, they are deficient in areas of instructional technology. Therefore, that is the gap in which the researcher explored within this study. The purpose of this correlational study is to investigate whether the technological leadership of a principal influences the integration of technology within their schools.

Design

This study was descriptive in nature and the researcher used qualitative inquiry methods. This investigation specifically sought descriptions and explanations of integrating technology from middle school principals, teachers, and media specialists. Qualitative research is a multi-method focus involving an interpretive and more naturalistic approach to its subject matter. In this method, the researcher is personally involved in the data collection process and seeks to make sense of personal stories and their application as a parallel to leadership practice (Kozloski, 2006). Qualitative researchers aim to acquire an in-depth understanding of human behavior and the reasons that govern human behavior. They investigate the why and how of decision making. Qualitative research categorizes data into patterns as the primary basis for organizing and reporting results. Qualitative researchers typically rely on four methods for gathering information: (1) participating in the setting, (2) direct observation, (3) in-depth interviews, and (4) analysis of documents and materials. For the purpose of this study, the researcher will rely upon in-depth interviews.

A descriptive study using interview data to obtain information on the influence of principals' technological leadership upon the integration of technology within the curriculum was used for the purpose of this research. Technological leadership was explored in the

following two areas: the use of technology in the school and principals' effect upon the use of technology.

Specifically, the study was designed to answer the following research questions:

1. What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?
2. What do media specialists of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
3. What do core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
4. What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?

Population

This investigation specifically sought after descriptions and explanations of integrating technology from middle school principals, teachers, and media specialists. The participants within the study included 2 principals, 2 media specialists, and 16 teachers (7 teachers from School #1 and 9 teachers from School #2) within the two middle schools of Burns County. The teachers were selected purposefully by the researcher to ensure all academic areas from various grade levels were represented. In securing a random purposive population, the researcher placed the names of all the teachers in a hat and selected the participants. However, the researcher continued to pull the names of participants until all academic areas (Mathematics, Science, Social Studies, Science) and grade levels (sixth, seventh, and eighth) were represented. This process was followed individually for each participating school. Therefore, the number of participants was 20.

Instrumentation

The researcher devised interview questions for the principals and then different interview questions for the teachers and media specialists (see Appendix B). The principals' interview questions sought input regarding their technology training, the use of technology in their school, and their influence upon the use of technology in their school. The media specialists and teachers' interview questions sought input regarding the use of technology in the school and the principals' influence upon the use of technology.

At the beginning of the interview, participants were informed of the interview protocol that had been established. Interviews were recorded for research review and transcribed at a later date.

Data Collection and Analysis

Interviews are used extensively in educational research to collect data about phenomena that are not directly observable: inner experience, opinions, values, interests, and the like. They also can be used to collect data about observable phenomena more conveniently than by direct observation (Gall, Gall, & Borg, 2007). All interviews were recorded and transcribed. The recording of interviews allowed for data transcription by the researcher in the process for the purpose of presenting an unbiased view of the interview data. Throughout the interview, notes were taken on a standard form (see Appendix C). The researcher interviewed both of the middle school principals individually. The same approach was used for the media specialists. However, the teachers were interviewed through focus groups. Focus group interviewing relies heavily on facilitation or moderator skills. Focus group interviewing depends on interaction within the group, stimulated by the researcher's questions (Glesne, 2006).

After data responses were reviewed, the data was analyzed and it is from this data that the researcher was able to formulate conclusions. The researcher used a coding/category system to analyze data. The researcher used grounded theory principles and the method of constant comparison to compare entries within and across categories (Gall, Gall, & Borg, 2007). This allowed the researcher to generate constructs, themes, and patterns from the categorical data. Constant comparison occurs when the researcher uses the initial interviewee's responses to form categories and codes/compares the subsequent interviews to the categories established from the initial interview (Dick, 2005). Grounded theory is a research method that discovers theory from data. The goal is to understand the action in a substantive area from the point of view of the individuals involved. The method is "grounded" because a theory is systematically obtained from a broad array of data through a rigorous process of constant comparison (Adolph, Hall, & Kruchten, 2008). Coding is a progressive process of sorting and defining and defining and sorting those scraps of collected data (i.e., observation notes, interview transcripts, memos, documents, and notes form relevant literature) that are applicable to the research purpose (Glense, 2006, 152). Open coding involves the examination, comparison, conceptualization, and categorization of data. Raw data are examined for similarities and differences, and initial conceptual categories or phenomena are identified.

The researcher organized the qualitative interview data. Within the principals' interviews, questions 1-2 measured each principal's technological training. Interview questions 3-5 measured the principals' personal/professional use of technology. Interview questions 6-11 measured the principals' effect upon the use of technology.

The media specialists and teachers were asked the same interview questions, however, their interview questions differed from the interview questions asked of the principals. Within

the interviews with the media specialists and teachers, interview questions 1-4 measured technology use within the school and interview questions 5-7 measured the principals' effect upon the use of technology.

Research question one (What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?) was analyzed to produce findings regarding the two principals' views regarding their technological training, the use of technology use in the school, and the principals' effect upon the use of technology in their schools. Research question 2 and research question 3 (What do media specialists/core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?) was analyzed to produce findings regarding the actual use of technology in schools and principals' effect upon the use of technology within each school. Research question 4 (What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?) was analyzed to produce findings of whether there was a relationship between what the principals perceived to be occurring in their school in terms of technology verses what their media specialists and teachers identified as actually occurring in the school in terms of technology. In other words, the researcher was able to determine if there was a relationship between technology leadership and technology integration for each individual middle school by comparing the responses of the participants.

After the completion of this study, the results of the study (i.e., audiotapes/transcripts) were discarded.

Delimitations of the Study

The following aspects were viewed as delimitations of the study:

1. Only the principals of Burns County were assessed.
2. The small number of respondents limited the generalizability of the study.
3. This was an exploratory study, designed to discover relationships among the variables rather than investigate cause-effect relationships.

CHAPTER IV

RESULTS

Burns County School System is located with the CSRA district of Georgia. The system has more than 50 schools. Approximately 70% of the schools made Adequate Yearly Progress (AYP), while 30% did not. Roughly 33,000 students are enrolled within the schools within the district. The composition of the student population is as follows: 73% Black, 22% White, 2% Hispanic, 1% Asian, and 2% Multiracial. About 67% of the students qualify for free or reduced lunch. Nearly 22,000 students are transported each day. The county employs around 2700 certified employees. .

School #1 is composed of approximately 500 students. The composition of the student population is as follows: 90% Black, 7% White, 1% Hispanic, and 2% Multiracial. Approximately 93% of the students receive free/reduced lunch. There are about 46 certified teachers and three administrators within the building.

School #2 is composed of approximately 400 students. The composition of the student population is as follows: 61.1% Black, 32.2% White, 2.5% Hispanic, 2% Asian, and 2.2% Multiracial. Approximately 59% of the students receive free/reduced lunch. There are about 30 certified teachers and two administrators within the building.

Both schools involved in the study are middle schools located within the same county. The researcher interviewed the principals and the media specialists individually. However, the researcher interviewed the teachers using focus groups; each school formed a separate focus group.

Table 1.

Demographics of Principals

	Principal #1	Principal #2
Race	Black	White
Gender	Female	Female
Highest Degree	Specialist	Doctorate
Years in Education	16	25
Years as a Teacher	5	16
Years as an Assistant Principal	3	3
Years as a Principal of another school	5	3
Years as Principal of current school	3	3
Received In-Tech Training	Yes	Yes

Table 2.

Demographics of Media Specialists

	Media Specialist #1	Media Specialist #2
Race	Black	White
Gender	Female	Female
Years in Education	25	13
Years as a Media Specialist	7	7
Years as Media Specialist at current school	4	3

Table 3.

Demographics of Teachers of School #1

Teacher's Name	Race	Gender	Grade/Subject Teach	Years of Experience
Teacher #1	Black	Female	8th Grade/Language Arts	2
Teacher #2	White	Male	6th Grade/ Social Studies	10
Teacher #3	White	Female	6th-8th Grade/Special Education (all classes except Math)	36
Teacher #4	Black	Female	6th-8th Grade/ Technology	17
Teacher #5	Black	Male	8th Grade/Math	4
Teacher #6	White	Male	8th Grade/Science	4
Teacher #7	Black	Female	8th Grade/Science	26

Table 4.

Demographics of Teachers of School #2

Teacher's Name	Race	Gender	Grade/Subject Teach	Years of Experience
Teacher #1	White	Male	6th Grade/Math	22
Teacher #2	White	Female	Instructional Coach	19
Teacher #3	Black	Female	6th Grade/Math	13
Teacher #4	White	Female	Special Education	5
Teacher #5	White	Female	8th Grade/ Science	25
Teacher #6	White	Female	8th Grade/ Math	15
Teacher #7	Black	Female	7th Grade/Language Arts	14
Teacher #8	White	Male	Business Education	9
Teacher #9	Black	Female	7th Grade/Math	25

Principals and media specialists were asked their years of experience in education as well as their years of experience in their current position. Teachers were asked to identify the grade level and subject matter in which they taught as well as their years of experience in education. Both of the principals were veteran educators having at least 16 years in the school system and both have served three years as principal of their current school. Teachers from various core curriculum courses, special education, and business education participated in the study. The years of experience of teachers from School #1 ranged from 2 to 36. The years of experience of teachers from School #2 ranged from 5 to 25. Participants were directed to speak directly about their current school. The interviewer attempted to follow the interview questions in order; however, some questions became redundant with the interviewees' responses. In these cases, after an active listening response was given back to the interviewees regarding the question, the researcher asked the participants if they had any additional information on the topic.

A descriptive study using interview data to obtain information on the influence of principals' technological leadership upon the integration of technology within the curriculum

was used for the purpose of this research. Technological leadership was explored in the following two areas: the use of technology in the school and principals' effect upon the use of technology.

Specifically, the study was designed to answer the following research questions:

1. What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?
2. What do media specialists of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
3. What do core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
4. What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?

After transcribing the interviews of all of the participants, the data was further analyzed by the researcher. This section of the results reported themes that emerged throughout the interview as they related to the research question and its subquestions.

In response to research question one (What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?), it was determined that both principals felt that their effective leadership style influenced technology usage within their schools. Both principals pointed out that they involved their teachers within the process of utilizing technology by respecting and implementing the ideas of the teachers along the pathway. Both principals stressed the significance of modeling their expectations and found such an act to help define their leadership. Also it was determined that both principals have received formal training with technology (i.e. In-tech and other available training

opportunities). Both administrators acknowledged the fact that their effective leadership styles highly influenced technology usage within their buildings. Both principals used various leadership approaches to support technology integration within their building. However, transformational leadership and ideas-based leadership appeared to be most commonly used. Both administrators found that the primary way of creating intellectual capital within their buildings was to put emphasis on the development of a strong knowledge, competency, and skill base among their stakeholders.

Principal #1: Principals' Technological Training

Principal #1 began technological training during the earlier years of her career as a teacher and has always taken advantage of the technology training offered by the county. However, both principals recently took advantage of training sessions with Data Director, a software program that the county uses to assess student, school, and county data. Principal #1 felt that In-tech training was most valuable as the 7-day session taught her how to properly use Word, Excel, PowerPoint, Email, and the Internet. Principal #1 revealed that she received more training and continues to take advantage of training opportunities as they present themselves. She stressed that as the leader she must be trained to make sure she knows the look-fors in ensuring teachers and students are using the technology properly.

Principal #1: Technology Use

Both principals identified email as a significant technology tool. However, Principal #1 also mentioned Publisher, Excel, Data Director, School Max, and EBIS as programs used almost daily. Principal #1 noted the computer was the most beneficial technology tool while Principal #2 stated email. Principal #1 pointed out that the computer had everything (the internet, email, spreadsheets, and housed all of her data). She also revealed that she used technology on a

regular basis to check email. She stated that she used technology to generate data to figure out the overall path of the school in order to drive instruction. She also noted that most of her teachers had Promethean Boards in their classrooms and those teachers who did not currently have them would have them this school term. All of her teachers received Promethean Board training. There was also a portable Promethean Board within the school. Several of the classrooms had projectors and the principal labeled overheads as outdated technology. School #1's media center was outfitted to have flat screens and the most updated technology by the end of this school term. School #1 received Title I funding and received a grant for more technology.

Both principals stressed the significance of technology within the curriculum and required that teachers utilize their available technology resources to promote learning within the classroom. Principal #1 cited that the use of technology within student instruction kept the students actively engaged and allowed them hands-on opportunities. She further identified instructional software programs, such as Destination Math, Destination Reading, and Online Assessment System (OAS), as additional tools used to assist students. School #1 offered a Keyboarding and Computer Literacy class as well as a Technology class. Within the Keyboarding class, basic keying and computer literacy was taught. However, in the Technology course, the students were taught skills such as interior design and architecture and editing of music in 4-D on new computers received through a grant. Principal #1 stressed the significance of technology within instruction as it offered learning in a participatory manner that made learning more exciting to the students. She also mentioned that it was important that everybody understood how to use technology. The teachers needed to be able to help students with technology and enhance their classes through technology. She felt that if technology was brought in the classroom more students would enjoy school more. Principal #1 stated that when

there was a lack of technology that there was a lack of engagement from the students. She further brought up that when technology was not used, students were missing out on extra learning. She pointed out that each classroom had a teacher computer and an extra computer or two for student use. The school had three computer labs (one for each grade level). Both principals gave a rating of 8 (on a scale of 1 to 10, with 10 being the strongest) when asked to rate their belief of whether or not technology made a significant difference in the classroom. Principal #1's justification for her rating was that some teachers had the ability to have their students engaged without any technology. She also revealed that technology was not the teacher, but was simply a great tool for the teacher to use.

Principal #1 stated her first goal was to complete the outfitting of the Promethean Boards in the school, then remove all of the non-flat screen computers from the Media Center into classrooms and update the Media Center with flat screens and updated software. ELMOs (document cameras) were already ordered to replace the overhead projectors and PC tablets were ordered for administrators to complete observations. She mentioned that she wanted to stay abreast of the latest technology and its trainings. She declared that it was important that not only the teachers were trained to use technology but she as the school leader was capable of utilizing the tool properly as well.

Principal #2: Principals' Technological Training

Principal #2 was more technologically focused than Principal #1. Principal #2 explored with technology on a continuous basis while Principal #1 focused on training that was specific to her needs at that specific time. Principal #2 described her training in the area of technology as basic and identified her training with instructional technology as not extensive. However, Principal #2 also had recently taken advantage of training sessions with Data Director. She

found that learning on her own within her position was the most valuable form of training. She also felt the training she received had little to no effect upon her leadership. She described herself as "pretty technologically savvy". She pointed out that she tried to keep her teachers abreast of technology, but it was helpful when they were actually able to use what they were being taught. However, under her leadership she encouraged her teachers to use what they had and she supported them in using it. Principal #2 cited that part of her ongoing professional learning was to keep teachers updated with their use of web pages and the Internet, constant communication with parents through email, and the use of Gradebook and Attendance. She declared that she tried to make teachers' technology use more proficient for students and for their personal use.

Principal #2: Technology Use

Principal #2 also identified email as a significant technology tool. However, she declared that she used a personal digital assistant (PDA) and text messaging. Principal #1 noted the computer was the most beneficial technology tool while Principal #2 stated email was. Principal #2 cited that she preferred to communicate via the email as opposed to other forms of communication because it was convenient and a time-saver. The administrator pointed out that she used technology on a regular basis to communicate with teachers, parents, and colleagues. Unlike Principal #1, Principal #2 described technology within her school as limited. Most classrooms did not have modern computers and thereby inhibited the use of technology for student instruction. School #2 was a non-Title I school and was recently denied a grant for technology.

Principal #2 also felt that the use of technology within student instruction was very valuable and felt that her school was missing that link to the 21st Century. She noted that her

school was barely on track with technology. Like School #1, School #2 used software programs such as Destination Math and Destination Reading for instruction. Principal #2 stated:

> "A large number of our kids have computers at home and do have computer capabilities, but then at school where we should be teaching kids about cutting edge, that is what we are missing. While we might do our very best and nothing can take the place of a teacher, we are missing out on a whole piece that we could add to bring our level of instruction to meet a whole different plane. I think our students are at a disadvantage when they do not have that."

Principal #2 declared that a teacher that integrated technology into their classroom use was implementing a motivating tool for students. She further noted that she noticed that in classes where the teachers were logging in the hours and students had lots of training with Compass Odyssey (another instructional software program), that those students made higher and had higher test scores on the CRCT than teachers who were not utilizing the software to its fullest potential. Both principals gave a rating of 8 (on a scale of 1 to 10, with 10 being the strongest) when asked to rate their belief of whether or not technology made a significant difference in the classroom. Principal #2's justification for her rating was that some students (that might not be otherwise) would be motivated by the use of technology. She further mentioned that a teacher could have all the technology in the world and not know how to properly use it and that would not yield desired results. The administrator cited that part of her school improvement plan was to continue to add technology. She stated that she would continue to look for grants and/or community partnerships to support this endeavor because she felt as a school system that the funding was unavailable for her particular school. Principal #2 noted that technology was very

important and that she felt very comfortable with the fact that her teachers were using what they had to enhance instruction for their students.

In response to research questions two (What do media specialists of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?), evidence revealed that both schools incorporated some form of instructional technology within their curriculum. Both media specialists found that the building level principals' expectations of technology usage strongly motivated technology integration within their schools.

Media Specialist #1: Technology Use

School #1 utilized instructional technology quite a bit more than School #2 simply as a result of the availability of resources (i.e. equipment and funding). Media specialist #1 declared that technology was very assessable to all of the students in the school. They had three computer labs, 2-3 computers and an LCD projector in each classroom, Promethean Boards, digital cameras, and camcorders for their use. Media specialist #1 cited that technology is used for CRCT practice, framework benchmark, differentiation, Destination Success, and for research. She pointed out that the Promethean Boards were used across all subject matters and it allowed the students to interact directly with a technology tool. She also brought up that her principal was a big fan of technology and tried to provide the finances and support for technology. In addition, she responded that technology provided numerous advantages because it provided its users with feedback and remediation.

Media specialist #1 brought up that her principal was very dedicated to technology as it was evident within the school. Of the approximate 40 classrooms, 26 of the classes already had Promethean Boards. The remaining 14 classes without Promethean Boards would receive theirs

in the very near future; they had already been ordered. The principal managed to ensure that teachers actually used the technology that was provided to them. The teachers actually used it within their instruction; they received training on its use and the principal assisted them as needed as well. Media specialist #1 felt that her principal was really geared toward most of the programs that utilized technology and required its integration within classroom instruction. The media specialist mentioned that she felt that technology opened up many doors for the students and that students were normally technologically literate and it should have been used to enhance the learning environment.

Media Specialist #2: Technology Use

Media specialist #2 brought up that technology was very minimal at her school. She mentioned that there were three computer labs and at least one modern computer in all but three classrooms. She also noted that there was 1 LCD with an Active Board within the school (and that it is located in the Mathematics Lab) that was not utilized to its fullest potential because the teachers had not been properly trained in its use. In addition to the basic computer class, both of the middle schools offered a separate technology course. She revealed that there are 12 classrooms that have LCDs and those classes used their LCD for instruction, one LCD within the Special Education Department, one LCD in the Mathematics Lab, and one additional LCD in the Computer Lab (a total of 15 LCDs in the building). United Streaming and Compass Odyssey were two instructional websites identified to assist in instruction. She noted that the Special Education Department within the school also had technology and software that were used for their special needs students but the county purchased those items. The media specialist identified the TVator as the most frequently used technology tool because most of the teachers used it to give students their assignments as the TVator made the assignment more visible.

Media specialist #2 declared that her principal was quite comfortable with technology. She mentioned that her principal strongly encouraged the use of email and frequently uses PowerPoint in faculty meetings. She stated that her current principal was more technology-oriented than any other principal she had ever worked for. Media specialist #2 cited that "technology makes a world of difference". She further pointed out that its usage captured students' attention in that most students were already very knowledgeable and comfortable with using technology. She felt that it was important to provide students with as much 21st Century learning as possible; as it made them more marketable globally. Media specialist #2 pointed out that her principal was very dedicated to the use of technology in the classroom. She revealed that her principal was constantly trying to provide students with as much technology as she could but was often not granted the funding to have updated technology. In recently search of a technology grant, the school was denied funding. One of the committee's reasons for denial was that none of their "feeder" schools had technology. Some of the school's current technology had been funded through the Pay-As-You-Go Committee/Grant. Media specialist #2 revealed that the availability of training, technical support, and physical support of technology exists but financial support was significantly lacking. She further reiterated that her principal strongly desired to have more technology within the building. Specifically, one of the school's goals was to purchase more Active Boards to be used in classrooms. Media specialist #2 declared that it was extremely frustrating not to have the financial support necessary in acquiring technological equipment. She further added that Title I schools had an overwhelming amount of technology equipment and they were being held accountable to the same standards but without the support they needed.

Table 5.

Available Technology

School #1	School #2
2-3 modern computers per classroom for student use	At least 1 modern computer per classroom in most classes (primarily for teacher use)
15 LCD projectors	1 LCD with an Active Board within the school
Majority of the classrooms had Promethean Boards	None of the classrooms had Promethean Boards
3 computer labs (each lab has an LCD projector)	3 computer labs (without LCD projectors)
Televisions in each classroom	Televisions/TVators in each classroom
Overhead Projectors	Overhead Projectors
Large variety of technology within Special Education Department	Large variety of technology within Special Education Department
Business Education class contained all modern computers	Business Education class had 9 out of 30 modern computers
Instructional technology was available in each classroom and in all computer labs	Instructional technology was only available in the computer labs
Students participated in instructional technology in all classes daily	Students only participated in instructional technology within their Mathematics and Language Arts classes on a rotational basis (i.e. every 7-9 days)
Both schools utilize the following instructional software: United Streaming, Compass Odyssey, Online Assessment System (OAS), Destination Math, and Destination Reading	

In response to research questions three (What do teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?), evidence confirmed that both schools utilize technology however on various levels. It was determined that both sets of teachers used technology instructionally within their classrooms (or computer labs) to some degree as was expected/required by their administrator.

Teachers of School #1: Technology Use

Teachers from School #1 all had some type of technology within their classroom and had access to technology throughout the school. The majority of their classrooms were equipped

with Promethean Boards, computers, televisions, DVD players, overhead projectors, and LCD projectors. The Special Education teacher had a large array of technological tools within her classroom to include computers, scanners, a black/white printer, a color printer, a DVD player, a television, VCR, and a piece of equipment that takes dictation. Teachers from School #1 declared that technology was used constantly. Some of the ways in which they used technology within instruction included the following: the Internet was used to do background enrichment, and PowerPoints were used to identify the daily components of standards based instruction. They watched videos in the form of DVDs and online also. Some of the teachers utilized the supplementary technology that was a part of the textbook. Most of the teachers pointed out that they used instructional websites such as United Streaming to support their instruction. It was also revealed that the students actually use the Promethean Boards within the classrooms. Both Business Education teachers utilized technology, especially the computers daily within their instruction as outlined by the state curriculum. The teachers of School #1 noted that the use of PowerPoint, the internet, instructional websites, instructional videos, the Promethean Board, and scanning of text were their most frequent uses of technology. The Business Education teacher mentioned that she used Microsoft Word, Excel, and PowerPoint daily within her course. The teachers of School #1 mentioned that they utilized their classroom computer to satisfy administrative tasks (i.e. communicating through email). Teachers from School #1 cited that students generally enjoyed the hands-on of technology. The use of technology within instruction stimulated the learners and encouraged students to be participatory. It was also mentioned that technology assisted with differentiated instruction as it captured the attention of both visual and auditory learners. All of the teachers of School #1 felt that technology usage made a significant difference within the classroom. One of the teachers pointed out that when assessments were

taken on the computer, immediate feedback was provided to both the student and the teachers and found that to be extremely advantageous. There was a consensus among the group that technology made learning a bit more captivating, motivating, and interesting to the students. One of the teachers brought up that the "old way" of teaching, such as lecturing and giving bookwork, was obsolete to an extent and that the incorporation of technology was very vital. One of the teachers mentioned that she has noticed a difference in student achievement when technology was utilized; the students' scores tended to increase favorably.

The teachers from School #1 noted that Principal #1 was very dedicated to the integration of technology as was apparent in the amount of available up-to-date technology within the building. On a scale of 1-10 (with 10 being high), the interviewees rated the principal individually from 7-10. The teachers from School #1 stated that instructional technology was a top priority of the principal. One of the teachers mentioned that new technology, specifically Promethean Boards, was constantly being added to the inventory. The teachers of School #1 cited that technology was here to stay and that the more one learned about technology to utilize in the classroom the better classroom management and cooperation a teacher would receive from the students. In addition, allowing them to utilize technology not only assisted them with their schooling but also prepared them to be more marketable when seeking employment. It was also mentioned that students generally had an appreciation of technology and it should be used in a manner to increase student achievement. However, the teachers revealed a couple of downfalls of technology to the negligence that provided adequate training in utilizing the equipment. Teachers were given an introductory course but no follow-up training. Also once the training was given, new teachers were not given the opportunity to apply their new learning. Another drawback of technology noted was the opinion that a number of instructors become dependent

upon its use and are "lost" if the equipment is inoperable. Properly updating software (countywide) was also cited by the teachers as a vital component.

Teachers of School #2: Technology Use

Teachers from School #2 revealed that technology was "very" limited. It was cited that there was generally one computer in each classroom and that the computer was utilized by the teacher. Each classroom has a TVator and possibly an overhead projector. The math teacher brought up that the computer lab was assessable to the math teachers within the building every seven days for use. Math and Language Art teachers have LCD projectors in their classrooms. However, similar to the Special Education Teacher at School #1, she has a large amount of technology. Like the teachers of School #1, the teachers of School #2 stated that they also used instructional websites such as United Streaming, Compass Odyssey, and Destination Math and Reading. The utilization of PowerPoint presentations and TVators were also mentioned as technological tools used in instruction. The teachers of School #2 cited that the use of the TVator, overhead projector, the math lab, LCD projector, and graphing calculators were ways in which they most frequently used technology in the classroom. The Business Education teacher of School #2 pointed out that he had a class of thirty computers, but only nine were considered to be "modern" (up-to-date). He brought up that most of his computers were nine years old. As a result, he had to teach the same concept to his students in at least three different versions in order to accommodate the difference in software equipment. All of the teachers of both schools mentioned that they utilized their classroom computer to satisfy administrative tasks (i.e. communicating through email).

The teachers of School #2 brought up that the principal is trying to place a Promethean Board in every classroom. The teachers even mentioned that she used technology when she

presided over faculty meetings. It was also revealed that the principal used email frequently to communicate. One of the teachers stated, "She models what she wants us to do". Similarly to the teachers of School #1, it was noted by the teachers of School #2 that their principal used technology constantly by communicating through email, and utilized technology (PowerPoint and LCD projectors) within faculty meetings. The teachers of School #2 stressed that the lack of technology in their school was unfair and described their frustrations of its lacking within their school. They all agreed that it engaged the students more and allowed for differentiated instruction. They stated that their students were more exposed to technology at home rather than in school and that the opposite should be true. The teachers of School #2 revealed that their principal was very dedicated as she attempted several times to seek additional technology for their school only to be denied. They declared that she was trying but was limited by funding. They all agreed that if they had the technology, she would definitely support it. The teachers of School #2 pointed out that Principal #2 constantly attempted to add technology to their school but was limited by financial support. The teachers brought up that they currently do not have the resources to purchase technology. One teacher made the following comment: "The more successful your school is, the less you get. If you are failing, you get everything, brand new computers, laptops, Active Boards for every classroom. You get the whole nine yards". One of the teachers of School #2 made the following comment: "I know that if we had more, our teachers would use it. We have a group of teachers who do so well with the limited technology. Imagine what we could do if we had what other schools have at their fingertips".

In response to research question #4 (What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?), the researcher determined that there is a direct relationship between principals'

technological leadership and the use of technology for student instruction. It was evident that both administrators exemplified characteristics of efficient technological leadership. They both led by example. Transformational leadership was one leadership style that was portrayed, as both leaders were capable of adapting to the available technology accommodations within their schools. Both principals stated that they modeled what they expected their teachers to implement. A connection was established between leadership and implementation. Principals' persistent approach of requiring the utilization of available technological tools forced teachers to perform expected duties, such as incorporating technology within their classroom instruction. Not only did both principals communicate via email, but also within their instruction to their faculty (i.e. faculty meetings), the leaders used technology tools such as computers, projectors, and/or Promethean Boards. It was the expectation of both administrators for their teachers to utilize the available technological equipment within each respective school. Both principals mentioned that they monitored teachers' instructional technology practices by physically performing classroom/lab walk throughs and by reviewing their teachers' lesson plans. Evidence from the teachers (and media specialists) supported the essence that technology integration was expected from their administrators and that they acted accordingly by utilizing what was available to them. In every instance, teachers and media specialists directly related to their principal as a guiding factor as it pertained to technology integration within their school.

Summary of Interview Data

Both of the schools involved in the study found technology integration to be vital in the learning process of its students. However, one of the two schools had more technology resources than the other. This advantage, however, did not guarantee an increase in student achievement, which was evident in Adequate Yearly Progress (AYP) indicators. During the 2007-2008 school

year, School #1 with technology funding did not make AYP while School #2 without technology funding did. Despite this difference, both principals required technology usage in the classroom. Even though School #2 had considerably less technology, Principal #2 expected her teachers to use what they had to its fullest potential.

Table 6.

AYP Status

	Title I School	2005-2006	2006-2007	2007-2008
School #1	Yes	Met	Did Not Meet	Did Not Meet
School #2	No	Did Not Meet	Did Not Meet	Met

Two common themes emerged from this study: (1) the principals' consistent technological leadership in guiding the implementation of technology for both instructional and administrative practices, and (2) the teachers' adherence of instructions in the area of technology usage within their various curricula. The interview data analysis revealed that while schools are currently using technology within its instruction (at various levels), that its weakness lies with the existing infrastructure (i.e. equipment, funding, and training).

There was a direct relationship between principals' technology leadership and integration and the use of technology for student instruction. Both principals personally used technology within the educational setting and expected the same from their teachers. Principals modeled and monitored their expectations of instructional technology. The leadership style of both principals exemplified the essence of "inspecting what is expected". The leadership characteristics of both administrators demonstrated that persistence, knowledge, and support all contributed to the teachers' conceptions of the significance of technology integration and thereby

positively influencing instructional technology within their curriculum to enhance the students' learning environment.

Both administrators were committed to idea-based leadership, which communicated to teachers, that they were respected, autonomous, committed, capable and morally responsive adults. Both principals modeled the use of effective technology, encouraged the use of technology to improve instruction, tried to allocate adequate budgeting to support technological practices, and proved professional learning for teachers to become more proficient in the use of technology. In addition, both administrators found that their leadership practices guided the application and views of their teachers in terms of its implementation and both principals agreed that particular approach within their leadership highly effected technology usage within their respective schools.

CHAPTER V

SUMMARY

As mentioned in Chapter I, educational leaders must seek to understand, promote and implement the notion that technology integration is not just about technology; it is about focusing on future generations and leading teachers to a change in pedagogy to support these generations with 21st Century teaching and learning strategies that increase student achievement. As noted by Wilmore and Betz in 2000, the principal's role is an important component to the success of technology integration. They summarize the success of technology integration by proposing that information technology will only be successfully implemented in schools if the principal actively supports it, learns it as well, provides adequate professional development and supports his/her staff in the process of change (Kozloski, 2006).

A descriptive study using interview data to obtain information on the influence of principals' technological leadership upon the integration of technology within the curriculum was used for the purpose of this research. Technological leadership was explored in the following two areas: the use of technology in schools and principals' influence upon the use of technology.

Specifically, the study was designed to answer the following research questions:

1. What is the personal assessment of two middle school principals in a CSRA school district regarding their technological leadership?
2. What do media specialists of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?
3. What do core teachers of two middle schools in a CSRA school district believe is the current integration and use of technology for student instruction in their school?

4. What is the relationship between principals' technological leadership and integration and use of technology for student instruction in their school?

Based upon the findings of this study, there was a relationship between principals' technological leadership and their schools implementation of technology. The two middle school principals utilized leadership styles that exemplified characteristics of a transformational leader who modeled expectations for its followers. The leadership practices utilized by the administrators communicated the message to stakeholders (i.e. teachers) that technology implementation was significant and expected within each respective school. The commitment to provide adequate equipment, resources, and training was provided by each administrator, however, at varying levels, to provide a basis for the institution of instructional technology based curricula.

Analysis of Research Findings

The major findings of the study include the following: 1) principals were consistent in their technological leadership by personally utilizing technology for both instructional and administrative practices, and (2) teachers' adhered to the model and/or instructions from their administrator in terms of technology usage within their various curricula. The interview data analysis of this study supports the essence that principals' technological leadership influenced technology implementation within classroom/lab instruction.

Discussion of Research Findings

Principals were consistent in their technological leadership by personally utilizing technology for both instructional and administrative practices. In their study, Dawson and Rakes (2003) determined that the principal's technology training had a direct influence upon the integration of technology within the school. Both principals have received formal technology

training and utilize those trainings within their professions to some extent. According to Foster (2004), findings support the growing recognition that competent administrative and teacher leadership contribute to school success and reinforce leadership as a shared social influence process. A technologically competent leader has more of a tendency of passing on technology-related characteristics within their schools. Problems confronting schools today, particularly problems of school reform are clearly adaptive problems and require adaptive leadership concepts and techniques (Owens, 2004). Specifically, Principal #2 did not use "lack of technology" as an excuse for not implementing instructional technology within her school. Instead, she adapted to the situation, and utilized what was available to her and her faculty. According to Foster (2004), principal leadership is an important factor that affects the effective use of technology in classrooms. Moreover, principals who are knowledgeable about technology and technological issues are important advocates for the integration of technology into schools. This was evident within the study by both administrators as both of them demonstrated characteristics of strong technological leadership within their schools.

Teachers adhered to the model and/or instructions from their administrator in terms of technology usage within their various curricula. According to Salpeter (2003), learning in educational settings needs to be relevant to real-life. As a result of preparing students for real-life, students should be prepared for the technological world in the classroom through the use of integrating technology within the curricula. According to Kozloski (2006), schools are currently doing well at using technology and applying it as an instructional strategy but their weakest link is having the necessary infrastructure, which includes the people, funds, and resources to do so. While School #1 was quite resourceful with technological tools, School #2 was extremely limited. In a study of the correlation between teachers' perceptions of principal's technology

leadership and the integration of educational technology, Rogers (2000) found that teachers who had positive perceptions about the principal's role in supporting the integration of technology were more likely to integrate technology themselves. Despite the fact that School #2 was at a disadvantage with its limited technological tools, the positive attitude of the administrator and teachers proved the fact that success did not solely reside with its technological inventory.

Conclusions of the Study

The researcher identified four conclusions as a result of this study. They are as follows:

1. Within this particular situation, the Title I school (School #1) had more money to fund technology in comparison to the non-Title I school (School #2). Regardless of available resources, administrators found that their technological leadership guided the use of technology within their schools.
2. Technology integration can be facilitated even with limited access to technology resources. Despite the varying degree of available resources, both media specialists provided evidence that technology integration is in existence within their schools.
3. Principals and teachers must receive technological training, specifically instructional technology training, frequently in order to execute instructional technology effectively within classroom instruction.
4. Principals' technological leadership has a direct relationship with their schools' usage of technology.

The first conclusion of this study is that the involved Title I school had an overwhelming amount of technology in comparison to the involved non-Title I school. According to the Principal of School #1 she customized her budget to allocate extra funding (after allotting funds for salaries, parental involvement, etc.) in the area of technology to provide as many classrooms

as possible with the latest technological tools. All schools are held accountable to the same standards but are offered varying types of resources. Funded through NCLB, Georgia provides grants to local educational agencies on the basis of their proportionate share of funding under Title I, Part A. The Georgia Department of Education considers this a local control issue to be defined by each district (Georgia Standards, n.d.). In fall 2005, nearly 100 percent of public schools in the United States had access to the Internet, compared with 35 percent in 1994. The ratio of students to instructional computers with Internet access in public school was 3.8 to 1 in 2005, 4.4 to 1 in 2003, and 12.1 to 1 in 1998 (National Center for Education Statistics, 2006). The researcher found it difficult to conceive that funding for School #2 was contingent upon another school's, their feeder school's, technological stance. School systems should award funding based upon commitment and evidence that the recipient will use the funds responsibly for its intended us. The researcher was quite surprised that parental involvement was not obtained to improve School #2's technology inventory. Despite the diverse availability of technological resources between the two involved schools, principals exercised technological leadership that resulted in the implementation of technology integration within both schools.

The second conclusion is that technology integration can be facilitated even with limited access to technology resources. In their 1999 study, Ertmer et al. examined the relationship between first- and second-order barriers to technology implementation by surveying, observing, and interviewing several teachers within a single school who had achieved varying levels of integration. Researchers discovered that first-order barriers (i.e., lack of equipment, time, training, and classroom help) were experienced by all teachers while second-order barriers (i.e., beliefs about teaching and learning, preferable instructional methods, lack of relevance, mismatch with classroom management style, and lack of confidence) were mentioned by

teachers who used computers as a supplement to the curriculum. School districts with limited budgets need to find creative ways for enhancing information and electronic literacy by pooling resources on a regional basis; developing partnerships with nearby libraries, colleges, and universities; seeking advice and assistance from local, regional, and national computer companies, and finally, requiring all teachers and administrators to upgrade their technological skills on a regular basis (Lunenburg & Ornstein, 2004). School #2 should seek financial assistance from organizations within the area. For example, there are two four-year colleges and several technical colleges within the county. A partnership between School #2 and the local colleges could be established to provide School #2 with updated technology equipment. Both schools had some level of instructional technology incorporated within its facility. However, in the case of School #2, computer labs were the primary location where technology integration occurred. The principal, media specialist, and teachers of School #2 all expressed their frustrations of having majority of their students' technological experience to occur within the computer lab. The teachers of School #2 noted that students traveled to the computer labs within their Mathematics and Language Arts teachers on a rotational basis. Students, on average, visited the computer labs every 7-9 days. The researcher did not find that favorable and there is research that supports the notation that computer labs are not the most beneficial setting to institute instructional technology. In computer labs, students have "limited " time in which to utilize the equipment. The mere presence of computers within a school does not denote that teachers and students have access to actually use the computers. By placing a resource outside of the normal working space of teachers and students it makes it more difficult to integrate computer activities with the other instructional and learning activities going on in the classroom (Anderson & Ronnkvist, 1999). People oftentimes equate leadership with how much technology

they have and this study provides evidence that that is not necessarily the case in all situations. Media specialists are usually responsible for ordering and maintaining the inventory of technology equipment within a school. In the case of both schools, technology existed at varying levels and both media specialists supported the fact that their principal encouraged technology integration within instruction.

The third conclusion is that principals and teachers must receive technology training, specifically instructional technology training, frequently in order to execute instructional technology effectively within classroom instruction. Fewer than 12 states currently require technology-related professional development for teachers, technology training for initial administrator licensure, and technology-related professional development for administrators. Such data suggest that states should consider policies, procedures, and resources directed to technology-related staff development and improving technology support (Georgia Department of Education, 2004). Abundant access and ongoing training will not lead to effective use if teachers are not encouraged, or expected, to use computers in meaningful ways. Without a doubt, strong leadership is critical (Anderson & Dexter, 2000). The researcher finds that it is extremely important that administrators, teachers, and students actually put their newly gained knowledge into action immediately following the completion of their training. If they do not have the opportunity to use that knowledge, then it will eventually be lost. The researcher found it interesting that all of the teachers regardless of their degree of available resources, made provisions for their students to have opportunities of utilizing technology for instructional purposes. However due to School #2's limited technology, their teachers (and administrator) should be given frequent "refresher" courses to help them maintain a current knowledge base in

properly utilizing the equipment for instructional purposes. Otherwise, they will "loose" that knowledge in which they are incapable of actually applying on a regular basis.

The final conclusion of this study is that principals' technological leadership has a direct impact on their school's use of technology. Findings reveal that some administrators are proficient in technology for data management and analysis and for administrative purposes. However, they are deficient in areas of instructional technology. It is not realistic to expect that principals and superintendents on their own will become trained in technology for instruction (Persaud, 2006). Principals with more professional education are more likely to respect, know about, and use research knowledge—which supports the fact that principals should seek out more professional training and spend more time reading and thinking about the challenges faced within the educational sector (Biddle & Saha, 2006). In their study, Dawson and Rakes (2003) determined that the principal's technology training had a direct influence upon the integration of technology within the school. The more technology training and/or experience acquired by a school administrator, the more likely technology integration was incorporated within the school.

Both administrators were committed to idea-based leadership, which communicated to teachers, that they were respected, autonomous, committed, capable and morally responsive adults. Teachers of both school was able to join with the leader in a common commitment to making practices, such as technology integration, within the school work for the better of the students, parents, and other stakeholders. Both principals modeled the use of effective technology, encouraged the use of technology to improve instruction, tried to allocate adequate budgeting to support technological practices, and proved professional learning for teachers to become more proficient in the use of technology. In addition, both administrators found that their leadership practices guided the application and views of their teachers in terms of its

implementation and both principals agreed that particular approach within their leadership highly effected technology usage within their respective schools. Both administrators identified technology as a key component of basic skills required of every current educator. It was also agreed by both principals that a leader with high capacity building skills created intellectual capital by emphasizing the development of knowledge, competence, and skill of parents, teachers, and other stakeholders in the school community. This intellectual capital was believed to be the foundation for a high level of student achievement.

Implications

The researcher found that principal leadership was a primary factor within the utilization of technology within instruction. It is the opinion of the researcher that administrative support and/or guidance yielded favorably results of instructional technology implementation. Further, it is the opinion of the researcher that a lack of administrative support would have yield results of just the opposite.

The researcher noted two conditions from this study that should be further explored: (1) the need for additional funding and support from the county to equalize technological resources for 21st Century learning and (2) the need of continual technology training amongst teachers to enhance their usage of technology to its fullest potential. The interview data analysis revealed that while both schools are currently using technology in their instruction (at various levels), that the weakness lies with the existing infrastructure (i.e. equipment, funding, and training). In addition, training should not be offered only as introductory courses. It is imperative to offer constituents follow-up technological courses to ensure knowledge is attained.

It is the desire of the researcher that the findings of this study provide a basis within the educational arena as it relates to preparing current and future administrators for the role as

instructional leader. It is imperative that building leaders demonstrate their competency in all instructional areas, specifically in terms of technology usage. The federal government has identified technology was a critical concept that is required of all stakeholders within the educational system—students, teachers, and administrators. Therefore, it is critical that educational leaders gain any and all training in the area of instructional technology in order to provide their respective schools with the necessary tools in providing teachers and students with 21st Century teaching and learning skills.

Recommendations For Further Study

This study was limited to two middle schools within the same county of the CSRA district of Georgia. To further validate this research, additional data gathering and analysis, across the county, state, or country would be helpful in supporting the conclusions of this study. The findings may not be generalizable. The study may be furthered by examining the use of technology within elementary and/or high schools. In addition, comparing the instructional technology practices of male and female teachers and/or veteran and new teachers could extend the study. Also, the technology leadership practices of male and female administrators and/or veteran and new administrators could be explored.

Summary

There is a relationship between principals' technological training and their school's implementation of technology. Principals must model practices, which they expect their teachers and students to replicate. Technology leaders at all levels must understand all of the components within the educational system that are required to lead technology integration as an instructional strategy and assist in making technology a transparent tool in teaching and learning.

A technologically competent leader has a greater tendency to pass on technology-related characteristics within his or her school. The transformation of integrating technology within the curriculum is everyone's responsibility but the primary responsibility resides with the school's principal being receptive and competent in the area of technology before its consistent implementation is visible within the school. It is imperative to utilize technology and its capabilities to its fullest potential in order to progress within global society.

School leaders that are technology leaders see more use of technology in their schools. They articulate and model the technological mission, vision, values, and beliefs of their school and district. They also drive the technology plan by providing opportunities for teachers and students to achieve the plan's goals and objectives. Principal leadership is a vital factor that affects the effective use of technology in classrooms. When used properly, technology becomes an accelerator of momentum and makes learning more interactive and captivating for the average student. Principals must use that ideal to their advantage to not only prepare students for the 21st Century but to enhance learning within the educational arena as is prescribed by local, state, and federal mandates.

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APPENDIX A

COVER LETTER

March 31, 2008

To Whom It May Concern:

As you know, I am currently a graduate student at Georgia Southern University pursing my Doctorate degree in Educational Administration. One of the requirements of the program is to complete a research study. My research topic is The Relationship Between Principals' Technological Leadership and Their Schools' Implementation of Instructional Technology. I will be looking at the influence of a principal on the implementation of technology at his/her individual school. The purpose of this letter is to request your permission to incorporate this study and access the data necessary for the completion of my graduate research study, which includes surveying principals within Richmond County.

Technology usage is a vital skill in today's society and should be used throughout the curriculum whenever possible. I would like to conduct research with principals of Richmond County and see if positive results are established. This study will benefit the schools of Richmond County greatly. If the methods work then the school's productivity rate and overall technological ability will increase which in turn will increase students' academic achievement. The researcher will handle the funds, needed supplies, and time. Richmond County's name will not be mentioned; a fictitious name will be used unless requested to do otherwise.

There is, of course, no penalty should you decide not to participate or to later withdraw from the study. If you agree to participate, please complete the attached questionnaire and place it in the self-addressed envelope provided. Please be assured that your responses will be kept absolutely confidential. All of the questionnaires and return envelopes are identical. Neither I nor anyone else will be able to identify your response from those of other participants.

If you have any questions about this research project, please call me at (706) 796-9692. If you have any questions or concerns as a research participant in this study, they should be directed to Dr. Paul Brinson, chair of my dissertation committee, at (912) 478-5324. Let me thank you in advance for your assistance in studying this issue.

Sincerely,

D'Andrea Burns Jackson
Doctoral Student of Educational Administration, Georgia Southern University

APPENDIX B

INTERVIEW QUESTIONS

PRINCIPAL'S INTERVIEW QUESTIONS

1. Describe any training that you have had in the use of technology.
2. What is the most valuable training you have had in the use of technology?
3. What technology do you use regularly, either personally or professionally?
4. What technology would you say is the most beneficial to you? (That is, which one would you really hate to be without?)
5. How do you use the technology described on a regular basis? (What specifically do you do with it?) (Describe how technology is used in your school.)
6. What value do you believe is there in the use of technology for student instruction?
7. How has your technology training prepared you to lead technology instruction?
8. What have you done since your technology training to lead technology integration in your building?
9. What difference does the use or lack of technology make in the classroom?
10. On a scale of 1 to 10 (with 10 being the strongest), how strongly do you believe that technology makes a significant difference in the classroom?
11. What are your future goals with regard to technology?

MEDIA SPECIALISTS' AND TEACHERS' INTERVIEW QUESTIONS

1. How available is technology in your school for student instruction?
2. How is technology used in your school for student instruction?
3. Give me an example of one of the most frequent uses of technology in the classroom.
4. How does your principal use technology himself/herself?
5. What difference does the use of technology make in student instruction?
6. How dedicated is your principal to the idea of integration and use of technology in the classroom?
7. To what extent do you see your principal making technology a priority for classroom use?

APPENDIX C

INTERVIEW NOTES FORMS

PRINCIPAL'S INTERVIEW	
Opening Statements and Discussion	
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
Question 7	
Question 8	
Question 9	
Question 10	
Question 11	
Other Comments	
Research Comments & Reflective Notes	

MEDIA SPECIALISTS' AND TEACHERS' INTERVIEW	
Opening Statements and Discussion	
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
Question 7	
Other Comments	
Research Comments & Reflective Notes	

APPENDIX D

INSTITUTIONAL REVIEW BOARD (IRB) LETTER

Georgia Southern University
Office of Research Services & Sponsored Programs

Institutional Review Board (IRB)

Phone: 912-478-0843
Fax: 912-478-0719 IRB@GeorgiaSouthern.edu
Veazey Hall 2021
P.O. Box 8005
Statesboro, GA 30460

To: D'Andrea Burns Jackson
1008 Caddenwoods Drive
Augusta, GA 30906

CC: Charles E. Patterson
Associate Vice President for Research

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees
(IACUC/IBC/IRB)

Date: December 12, 2008

Subject: Status of Application for Approval to Utilize Human Subjects in Research

After a review of your proposed research project numbered:**H09117** and titled **"The Relationship Between Principals' Technological Leadership and Their Schools' Implementation of Instructional Technology"**, it appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research.

This IRB approval is in effect for one year from the date of this letter. If at the end of that time, there have been no changes to the research protocol; you may request an extension of the approval period for an additional year. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, if a change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to notify the IRB Coordinator, so your file may be closed.

Sincerely,

Eleanor Haynes

Eleanor Haynes
Compliance Officer