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Technology Integration in Georgia Public Elementary Schools

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PRINCIPAL LEADERSHIP FOR

TECHNOLOGY INTEGRATION IN

GEORGIA PUBLIC ELEMENTARY SCHOOLS

by

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(Under the Direction of Teri Denlea Melton)

ABSTRACT

The purpose of this qualitative study was to identify actions and practices that effective technology leaders use to support and sustain technology integration in elementary school classrooms. Three Georgia public elementary school principals who had been identified as top building level technology leaders and three each of their teachers were interviewed using researcher developed interview questions that addressed the International Society for Technology in Education (ISTE) seven factors for successful technology implementation. The interviews provided insights into the principals' and teachers' perspectives regarding the principals' roles in effectively implementing classroom technology in their schools.

Interview data were analyzed inductively through pattern identification and coding. Three themes emerged from analysis of the principals' interviews: obtaining hardware, software, and training; communicating expectations for technology use; and, defining what was considered effective use of technology. The three themes that were gleaned from teachers' interviews were: the principals' encouragement, enthusiasm, and support for technology use; willingness and ability of the principal to provide needed educational technology hardware, software, and training; and, how the principals sought

to ensure the desired amount and type of technology integration in their teachers' classrooms. One theme—provision of equipment and training—was shared between the two groups, and seemed to be the foundation on which the rest of the leadership actions were built. The other themes showed that the two groups' perspectives of the principals' roles were similar and supportive of each other, as the teachers' emphases were essentially the way they perceived the principals' performance of their fundamental effective leadership behaviors. All of this led to successful technology integration.

INDEX WORDS: Educational leadership, School principal, Technology, Integration, Georgia Southern University.

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DEDICATION

This research study is dedicated to the glory of God, as well as to my wife Ruby Ann, daughters Jessica and Monica, and son Benjamin, with whom and through whom God has richly blessed me. God's guidance and leadership, along with the love and support of my family, truly lifted me up and strengthened me throughout this process.

In addition, I would like to express deep gratitude to my mother and father, Shirley and Tom Sawyer, who instilled in me a desire to learn, a responsibility to help others when I can, and a work ethic that demands I finish what I start. My mother, my sister (Tracey Fries), and even the memory of my late father have all served to inspire me to complete this research project.

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CHAPTER 1

INTRODUCTION

The current era has aptly been christened the Age of Technology (McCain & Jukes, 2000). While a visit to homes of many American children or adolescents would leave little doubt of the ubiquity of technology in this society, some schools have been slow to incorporate these technologies into their instruction, causing students to find school sometimes boring and irrelevant to their personal life experiences (Tapscott, 2009). Educators, then, are finding that there is a vociferous call for a paradigm shift from "old school" instruction to that which embraces today's technologies and uses them appropriately and effectively to engage students in learning (Prensky, 2001a; Tapscott, 2009). This call is especially apparent when people see data that show how powerful educational technology can be for increasing student achievement (Goldman, Lawless, Pellegrino, & Plants, 2006; McCoog, 2007; Schacter, 1999).

Since the effective use of technology in the classroom has been shown to increase student achievement and engage students in the learning process (Goldman et al., 2006; McCoog, 2007; Schacter, 1999), it is important to determine why it is not happening consistently and pervasively (Carbonara, 2006). One major factor is that teachers must be comfortable and competent with this technology in order to use it effectively with their students. In the past, studies had indicated that many educators came into the workforce without the requisite skills to use technology effectively in their everyday teaching (Moursund & Bielefeldt, 1999). Therefore, it stands to reason that the only technological skills that these teachers have gained were achieved either on their own or through staff development programs offered by or through their schools. These "digital immigrants"

can have great difficulty making technology work at all, much less understanding how to use it effectively to engage today's students (Prensky, 2001a). As younger, more technology-familiar "digital natives" (Prensky, 2001a) have entered the teaching field, and as veteran teachers have taken part in professional learning in technology, there has been an increase in technology use, but true integration is still not happening consistently, even by these teachers (Gorder, 2009).

Teachers are generally faced with grueling demands to keep up to date on the standards for the subjects they teach, as well as on instructional methods in education. Because of this, they often have little time or energy left for their families and other outside interests, much less taking on a task as substantial as learning new technologies and integrating them into their classrooms. In fact, some key research has shown that when technology integration is ineffective, the cause can often be traced back to incomplete or incorrect implementation (ISTE, 2008b). Since teachers' paths to effective technology integration are brimming with such obstacles, it is imperative that educational leaders address this important initiative. Building administrators are in a pivotal position to be able to provide teachers with training, classroom release time, follow up technology support, and instructional support so crucial to successful implementation (Creighton 2003). However, little research exists that shows building-level leaders taking the lead in rendering such support to their teachers. The current study explored the role of the principal in providing leadership for technology integration in the classroom.

Statement of the Problem

Evidence (Goldman et al., 2006; ISTE, 2008b; McCoog, 2007; Schacter, 1999) exists that shows the link between the integration of technology into classroom instruction

and student achievement. However, there are many obstacles to the consistent and pervasive implementation of such integration, some of which (e.g., teacher readiness) could be remedied through appropriate action from educational leaders. While such opportunities exist, they are employed in varying amounts from one location to another, and even from one leader to another. If all educators are to raise achievement for all students, then teachers must effectively integrate learning technologies on a more consistent basis. Therefore, effective leadership to ensure teacher efficacy in technology integration needs to be studied so that various facets of that integration can be identified and replicated.

School leaders are usually teachers' primary (and in many cases, best) professional learning providers. If these leaders do not provide training opportunities themselves, they generally are responsible for arranging and scheduling them via instructional coaches or outside consultants. Building-level administrators often are also accountable for guiding the implementation of technology integration in their schools. They often make decisions as to equipment acquisition (e.g., classroom response systems), software licensure (e.g., Accelerated Reader ™), and web-site subscriptions (e.g., Study Island). Since their leadership is so crucial to both the direction and degree of technology use in the school, it often becomes their responsibility to become technology leaders in their schools in addition to their other leadership responsibilities. Even if they do not provide personal technology expertise, they are responsible for providing the means by which technology integration occurs.

The researcher sought to determine in this study how effective technology leaders provide leadership in a way that fosters technology integration among their faculties.

These leaders might have become technology integration "experts" in their own rights, or they might have secured expertise from others (e.g., instructional coaches, teacher-leaders, outside consultants) to bring their teachers to efficacy in technology integration. In the current study the researcher gathered information regarding what leadership practices had been used in technology leadership and which leadership practices had garnered the greatest measure of success in fostering an environment of effective technology integration.

Research Questions

Demands continue to crescendo for classroom educators to integrate technology into their teaching and to ensure technology literacy for their students. At the same time, each generation of students becomes more tech savvy and technology oriented, creating the need for technology-rich learning environments to reach these students. Teachers need to become adept at using technology, and need an understanding of when and how to use it effectively as they teach. However, they often do not come into the teaching field possessing such abilities. School level administrators, especially principals, are in a unique position to bring to their faculties conditions needed to integrate technology into their teaching. Therefore, the overarching question that provided the focus of this study was: What leadership behaviors are exhibited by Georgia public elementary school principals that enable technology integration in the classroom? The following sub-questions guided the research:

1. How do principals in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?

2. How do teachers in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

Importance of the Study

The education community recognizes the importance of technology integration in classrooms, as evidenced by the inclusion of the technology mandates of No Child Left Behind. Teacher education programs are, or at least have previously been, inadequate to the task of preparing teachers to incorporate technology into their teaching, and certainly cannot enable teachers to learn to use and effectively integrate new technologies as they come available. Therefore, classroom educators need leadership in the many facets of instructional technology. These include areas such as procuring equipment, training teachers to use the various technologies, helping teachers understand when and how to use them effectively, and providing technical support.

While shining examples of effective classroom technology integration are available, such use is certainly far from consistent or pervasive. Some leaders seem adept at rendering the necessary guidance, while others may feel neither competent nor confident enough to give leadership in this arena. Gaining awareness of what effective leaders do to provide leadership will inform practice that results in quality technology integration in the classroom, as administrators will have a clearer understanding of the knowledge, skills, and conditions needed to meet the NETS-A Standards for Administrators (ISTE 2009). The insights uncovered by this study should also give school leaders clearer direction for their personal growth. Additionally, those who provide pre-service and in-service training in technology leadership for school administrators will have a greater understanding of what leaders need to know and be able to do in order to be

effective technology leaders. Most importantly, the ultimate beneficiaries of this study will be students who will benefit from the instructional innovation that shows such promise—classroom technology integration.

Procedures

Research Design

The researcher employed a qualitative research design in the form of a case study wherein principals and teachers took part in interviews using a standard, open-ended format (Gall, Gall, & Borg, 2007) to ascertain what strategies and techniques leaders employed to produce the positive results in faculty technology integration. The interviewer also obtained demographic information from the participants, and requested documentation to support data obtained in the interviews.

Sample and Sampling Techniques

This research incorporated multiple-case study design and purposeful, intensity sampling (Gall et al., 2007). Intensity sampling was appropriate for this research because it allowed the researcher to gather data from schools where the phenomenon being studied—in this case, effective leadership for technology integration—was exhibited with intensity. Additionally, convenience sampling was used to an extent, since the researcher conducted the research in his local Regional Educational Service Agency (RESA) area.

Instrumentation

The researcher designed the interview questions for the current study. Items were directly related to the research questions, and resulted from an extensive review of the literature regarding leadership and technology integration. The standard open-ended interview format was used in order to minimize the possibility of inconsistency or bias

among interviews, and to obtain thorough and systematic data (Gall et al., 2007). Although the same set of questions was asked to all participants, the researcher maintained enough flexibility to patiently probe further and request clarification when needed (Glesne, 2006). Members of the researcher's doctoral cohort and various other expert colleagues were asked to provide feedback with regard to appropriateness, effectiveness, and face validity of the questions and the overall efficacy of the instruments. A pilot study to ascertain face validity was conducted using one of the researcher's principal colleagues in his school district along with teachers from this principal's school, as these educators were not included in the actual study.

Data Collection

After the researcher obtained approval for the study from the Institutional Review Board (IRB) of Georgia Southern University, he obtained the names of elementary school principals in the region who were identified by the local Regional Educational Service Agency (RESA) and the local Georgia Educational Technology Center (ETC) as top technology integration leaders. Upon obtaining those names, an initial invitation was sent electronically to these elementary principals through means of e-mail. The e-mail invitation included information regarding the nature and purpose of the study, along with the statement of IRB approval. Follow-up e-mails to principals were necessary in a few instances, in order to clarify purpose and secure participation. After it was determined which participants would take part in an interview, the researcher contacted those persons to schedule interview dates, times, and locations at the convenience of the interviewees and interviewer. IRB information was also provided to participants prior to the interviews in this phase of the study and they were requested to sign an informed consent document.

Participation by the principal of a school also indicated the principal's approval for that school's teachers to participate. It was important that each participating principal have three teachers take part as well, so that data within and across these groups (i.e., all teachers, all principals) and sets (i.e., principal and teachers from the same school) could be compared and triangulated. The researcher conducted and made audio recordings of the interviews for later transcription and analysis.

Data Analysis

An interpretational analysis (Gall et al., 2007) of the data took place concurrently with data collection. Data were analyzed inductively as the interviews were conducted (Merriam, 2002). A preliminary coding list and rudimentary coding schemes, based on the literature, were developed before the interviews began, and were refined as data were obtained and analyzed, and as patterns were identified (Glesne, 2006) and themes were developed (Creswell, 2008).

A triangulation of the data sources was performed to determine whether or not data from principals were consistent or incongruent with data from their teachers, and if the other evidences provided by principals and teachers supported data obtained in the interviews (Creswell, 2008; Gall et al., 2007). Analysis was conducted at three levels: data from all principals; data from all teachers; and, data from each set of principal and teachers. Findings have been presented through all these analyses. Text information has been displayed in tabular form (e.g., matrices), and quotations from participants has been intertwined with the researcher's interpretations (Creswell, 2008).

Limitations/Delimitations

Limitations

As this research was conducted only within a specific geographical region of Southeast Georgia, it could be argued that the mostly rural and generally economically depressed nature of the area could mean that technology funding, and therefore technology availability, in this area might not be characteristic of other areas in the state or nation. This does not limit the value of the study, but might be considered a factor in how generalizable the research will be.

The researcher expected that those educational leaders who had a keen interest in technology or who had done a great deal in that realm would have been the most likely to participate in this study. While listed as a limitation because it could be perceived to have a negative impact on the data that were obtained, the researcher actually considered that participation from these individuals will be likely to yield "information-rich" data (Gall et al., 2007, p. 178).

Delimitations

The researcher chose to gather data only from personnel in elementary schools, not middle or high schools. While including these other schools would have substantially expanded the pool of potential participants, it also could have brought other factors into play that might have diverted the focus of the study.

Definition of Key Terms

Digital Immigrants: Author Marc Prensky (2001a) has used the term digital immigrants to describe people "who were not born into the digital world but have, at some later

point in our lives, become fascinated by and adopted many or most aspects of the new technology" (pp. 1-2).

Digital Natives: Author Marc Prensky (2001a) has used the term digital natives to describe our students today, who "are all 'native speakers' of the digital language of computers, video games, and the Internet" (p. 1).

Educational Technology: For the purpose of this study, the researcher has adopted the following definition from the Center for Applied Research in Educational Technology (CARET).

> As used in CARET, educational technology refers to the full range of digital hardware and software used to support teaching and learning across the curriculum. That includes desktop, laptop, and handheld computers and applications; local networks and the Internet; and, digital peripherals such as cameras, scanners, and adaptive devices. It generally does not include older analog media such as film and overhead projectors. (Center for Applied Research in Educational Technology, 2005)

Leadership: For the purpose of this study, the researcher has adopted Northouse's (2007) definition of leadership as "a process whereby an individual influences a group of individuals to achieve a common goal" (p. 3).

Technology Integration: For the purpose of this study, the researcher has adopted Edutopia's (2009) definition of Technology Integration:

> Technology integration is the use of technology resources--computers, digital cameras, CD-ROMs, software applications, the Internet, etc.--in daily classroom practices, and in the management of a school. Technology integration is achieved

> when the use of technology is routine and transparent. Technology integration is achieved when a child or a teacher doesn't stop to think that he or she is using a computer or researching via the Internet.
>
> Technology integration is achieved when technology is accessible and readily available for the task at hand, the 21st Century task. Technology integration is achieved when technology tools support the curricular goals, and help the students to effectively reach their goals. Students are more actively engaged in projects when technology integration is a seamless part of the learning process. (para. 1-2)

Chapter Summary

Research (Goldman et al., 2006; ISTE, 2008b; McCoog, 2007; Schacter, 1999) has indicated that educators who integrate technology into their lessons will help to increase their students' achievement, and will be more successful in engaging students in learning. However, teachers often find many obstacles to technology integration, and the instructional technology that is available to them is often poorly used, underused, or unused (ISTE, 2008b). Administrators, perhaps especially school principals, are in a unique position to provide teachers with the resources they need to become successful in this area. The purpose of this study was to explore the leadership behaviors exhibited by Georgia public elementary school principals that enable technology integration in the classroom. Through convenience and purposeful intensity sampling, the researcher asked elementary school principals and three teachers from each of their schools, all located in one RESA region in South Georgia, to participate in an interview in order to obtain a representation of technology leadership in their schools. Interview data were analyzed inductively through pattern identification and coding. The conclusions from this study can

be used to inform professional practice of administrators seeking to provide effective leadership in the realm of technology integration.

CHAPTER 2

REVIEW OF RESEARCH AND RELATED LITERATURE

Teachers often have a limited view of technology and how it should fit into the big picture of curriculum and instruction. They often realize that it can be an effective vehicle for presenting material to students (e.g., PowerPoint presentations), but often that is where the link between technology and curriculum ends. Technology is sometimes seen, and even taught in teacher preparation programs, as a separate entity, distinct from curriculum and instruction. Some believe, however, that what teachers need is to see these technologies applied in the context of the curriculum taught in the classroom (Moursund & Bielefeldt, 1999). Moreover, Honey, Culp, and Spielvogel (2005) pointed out that rather than focusing on technology usage itself, those who successfully integrate technology "show a clear and meaningful connection between technology and larger educational goals" (Implications section, para. 3). Carbonara (2006) asserted that in preparing teachers for the classroom, colleges of education must go beyond the simple point-and-click skills of technology use. These teacher candidates need to be instilled with an understanding of how to integrate technologies into their curricula in engaging and meaningful ways. It is the responsibility of educational leaders to assist teachers in this endeavor. This chapter will present the current literature related to technology integration, and the effects of leadership on the efficacy of that integration.

Technology Integration

Technology pervades the worlds of many 21st century American children and youth. Many are comfortable with gaming and other entertainment technologies, and have become quite familiar with the Internet through social networking sites (e.g., MySpace),

search engines (e.g., Google), and news/information sites (e.g., MSN). According to the Pew Internet and American Life Project (Hitlin & Rainie, 2005), roughly 21 million youth (ages 12-17), or approximately 87% of the entire age bracket, used the Internet at the time of the study. Educator and author McHale (2005) pointed out that some educators believe these students, who have been surrounded by digital technology essentially all of their lives, are fundamentally different than the students even one generation before them. Prensky (2001a) asserted that because these differences have changed the very ways that children's brains function, and because most educators think and teach in a way that was designed for educating previous generations, our current educational system was simply not designed to teach this new generation of students.

An urgent call for change was placed in the form of No Child Left Behind (NCLB) federal legislation, which (among other things) created a mandate that all American students become technologically literate by eighth grade (NCREL, 2007). Title II, Part D of NCLB specified that the primary goal of technology in schools is to improve student academic achievement, with additional goals being to ensure "that every student is technologically literate by… eighth grade," and "to encourage the effective integration of technology resources and systems with teacher training and curriculum development" (NCREL, 2007, p. 3). Partly in response to the technology literacy goal, the International Society for Technology in Education (ISTE) developed the National Educational Technology Standards (NETS-S) and Performance Indicators for Students that include: 1) Creativity and Innovation; 2) Communication and Collaboration; 3) Research and Information Fluency; 4) Critical Thinking, Problem Solving, and Decision Making; 5) Digital Citizenship; and, 6) Technology Operations and Concepts (ISTE, 2007). ISTE

(2008a) also responded to the technology integration requirement by creating the National Educational Technology Standards (NETS-T) and Performance Indicators for Teachers that were updated to their current form in 2008. In order to meet these standards, teachers should: 1) Facilitate and Inspire Student Learning and Creativity; 2) Design and Develop Digital-Age Learning Experiences and Assessment; 3) Model Digital-Age Work and Learning; 4) Promote and Model Digital Citizenship and Responsibility; and, 5) Engage In Professional Growth and Leadership. The performance indicators associated with these standards made clear the technology basis for all of the standards, and ISTE's implication was that all teachers should meet these standards.

Successful Technology Integration

The ISTE teacher standards help to guide the teacher in what to do with technology in the classroom, but research (Rosenberg 2000; White, Ringstaff, & Kelley 2002) also demonstrates the need to implement and use technology correctly. The very presence of equipment is not enough to create the powerful learning environment that is often sought through these means. The key to obtaining this effective educational climate is to implement the technology appropriately. The seven factors for successful technology implementation that ISTE has identified are:

1. Effective professional development for teachers in the integration of technology into instruction is necessary to support student learning.
2. Teachers' direct application of technology must be aligned to local and/or state curriculum standards.
3. Technology must be incorporated into the daily learning schedule (i.e., not as a supplement or after-school tutorial).

4. Programs and applications must provide individualized feedback to students and teachers and must have the ability to tailor lessons to individual student needs.
5. Student collaboration in the use of technology is more effective in influencing student achievement than strictly individual use.
6. Project-based learning and real-world simulations are more effective in changing student motivation and achievement than drill-and-practice applications.
7. Effective technology integration requires leadership, support, and modeling from teachers, administrators, and the community/parents. (ISTE, 2008b)

The International Society for Technology in Education found seven conditions that are important to ensure high quality technology implementation. For the first factor addressed by ISTE (2008b), effective professional development, the organization pointed to the 10 "Essential Conditions for Teacher Preparation" (ISTE, 2000), which it developed to support its NETS for Teachers (ISTE, 2008a). These conditions are needed both at the teacher pre-service level and in the schools themselves. They consist of: 1) Shared Vision (for technology use); 2) Access (to current technologies); 3) Skilled Educators (in the use of technology for learning); 4) Professional Development (consistent access to it); 5) Technical Assistance (for maintaining and using it); 6) Content Standards and Curriculum Resources (educators knowledgeable in subject matter and current in content); 7) Student-Centered Teaching (e.g., active, cooperative, and project-based learning); 8) Assessment (of effectiveness of technology for learning); 9) Community Support (connections to community); and, 10) Support Policies (e.g., rewarding innovative use of technology).

The second factor pointed to the need for technology use to be relevant to established curriculum standards, and for technology-based lessons to be just as rigorous as non-technology based lessons. The third standard reflected research (Kulik, 2003; Middleton & Murray, 1999) that indicated reduced effectiveness of technology integration when it was used less frequently or only supplementally. Kulik, for example, noted that integrated learning systems (ILSs) in reading showed very mixed results, but at the same time it became evident that many ILSs had been incompletely implemented. Middleton and Murray found that "student academic achievement was affected by the level of technology used by the classroom teacher" (Conclusions and Implications section, para. 1).

Factor four emphasized the importance of capitalizing on the capacity for technology to facilitate differentiation for diagnosing, instructing and assessing students. More than the less sophisticated, one-size-fits-all programs that characterized early forays into educational technology, more recent applications that provide more individualized experiences have been shown to be much more effective, especially for low performing students (Kulik, 2003; White & Frederiksen, 1998). The key to the fifth standard was for educators to create an environment where students feel comfortable working and sharing with their peers, as well as interacting with the technology. Kulik (2003) and others showed that these collaborative settings were more effective than individual use such as tutorial programs.

Factor number six further reinforced that more engaging content such as simulations and project-based learning are more effective than drill-and-practice type programs. Adams and Hamm (2008), for instance, pointed out that "one of the potential

benefits of a thematic project-based approach is that it can be highly motivating for students who have difficulties with the content" (p. 222). Cradler and Cradler (1999) noted that the change most frequently cited by teachers when using multimedia projects was student motivation.

Finally, the seventh standard emphasized the importance of modeling, support, and leadership from the adults involved in the educational process. This might be parents (Penuel et al., 2002), counselors (Gysbers & Henderson, 2002), principals (Honey, Culp, and Carrigg, 1999; Mann et al., 1998), or other school personnel.

Benefits of Technology Integration

NCLB's technology literacy and integration requirements were ultimately intended to have a positive effect on the legislation's primary goal--to increase student achievement. There is evidence to indicate that technology can indeed facilitate such an increase. Schacter's (1999) meta-analysis of over 700 empirical research studies showed that students with access to various instructional technologies exhibited positive gains in achievement on a variety of tests. McCoog (2007) explained that technology as a tool also enables or enhances other best practices in education. Differentiation, for instance, has a strong impact on student learning, and "thoughtful and purposeful use of technology… allows other avenues to be explored and helps in the process of differentiating instruction" (p. 27). Other research (Goldman et al., 2006) also indicated that students learn best in powerful learning environments such as those provided through technological means. The Internet (e.g., streaming video), interactive software and hardware (e.g., SMART Boards), and podcasts are a few examples.

Possible Lack of Benefits of Technology Integration

There are those who believe that technology is not only not beneficial to children in a school setting, but it takes attention and resources away from what they assert really is important for children's education. Cordes and Miller (2000) pointed to what they claimed to be potential hazards if computer use in children is overemphasized. A number of these dangers were discussed, including a variety of physical, emotional and social, intellectual, and moral hazards. They observed that while new medicines are only approved by the government after pharmaceutical companies prove that they are safe and effective for treating what they purport to treat, such research into the safety of computer use in children has been sorely lacking.

Cordes and Miller also contended that there are six essentials that research shows to be important to a healthy childhood, and which are most indispensable to our at-risk children. These include caring relationships with responsible adults, outdoor encounters with nature, unstructured play time, arts (both beyond the academic classroom and as catalysts to enrich the academic subjects), hands-on and physically engaging activities, and communication with beloved adults, including books and poetry read aloud, storytelling, and conversation. They stated that each of these vital educational elements is also important because it "supports the development of the full range of a child's human gifts, not just the intellect,… is strongly supported by research and practical experience,… (and) is especially critical to the education of our most socially and economically disadvantaged children" (pp. 62-63). The authors claimed that our rushed culture helps to deprive children of these essentials, a problem that has been exacerbated by the emphasis–both societal and financial–on computers in education.

While there is evidence indicating a link between effective technology integration and increased student achievement, some educators and researchers hold to their assertion that technology has at least limited effect on how much students attain. Oppenheimer (2003) posited that the optimistic view of computer technology's potential benefit to education is just another in a string of new technologies that had been heralded as a boon to teaching and learning, such as the motion picture, radio, and television. He did not equivocate in his assertion that the promise of increased student achievement linked to the use of computer technology is yet another of these "false promises" (p. 2). The author studied a variety of schools–from rural to urban, both well-funded and under-funded–and interviewed a number of stakeholders, from students to educational technology experts. While his view of technology in education was generally negative, he did temper it somewhat by citing some successful technology programs. His point was not that all technology should be removed from classrooms, but that readers should look realistically at what technology could and could not deliver in education. He averred that computers can play a role in good education, but cannot take the place of standard methods of a quality progressive education, such as inquiry, exploration, and hands-on learning.

Cuban (2001) studied primary school, high school and college classrooms in California's Silicon Valley to gauge computer use in what he considered would be a relatively technology-rich environment. Some of what he discovered supported his suppositions, while his research also produced a number of unexpected findings. For example, it was no surprise to the researcher that more serious users benefited from computer use. They used technology to strengthen their preparation for teaching, and they became more efficient and effective at administrative tasks that strengthened learning in

their classrooms. Preparation for their lessons also improved, with more effective materials resulting from their computer use. On the other hand, he did not expect to find that so few of the teachers he studied actually "integrated computer technology into their regular curricular and instructional routines" (p. 133).

Other unexpected findings in Cuban's study, specifically related to teaching and learning in these classrooms, included that no "clear and substantial evidence" (p. 133) was found that student academic achievement was increased as a result of information technologies use. Further, classroom technology was most often used by teachers to "sustain existing patterns of teaching, rather than to innovate" (p. 134). Finally, the author found that very few high school and university teachers employed new technologies to provide more project-based and student centered learning experiences for their students. (Computer use among primary school teachers was used in this context more often not because it fostered such innovation, but because these teachers were already engaged in such practices.) Cuban asserted that computer use will not produce academic gains unless it accelerates fundamental change in classroom structure and behavior. Only when students' and teachers' roles and relationships, as well as the social organization of the classroom, undergo rudimentary shifts will the use of instructional technology result in increased student achievement.

Perhaps taking this same idea one step further, Collins and Halverson (2009) wrote that "the identification of learning with schooling is slowly unraveling" (p. 129), and that technology is at the core of this shift. They asseverated that schools lack the relevance to remain motivating to students, and are out of touch with what students and many experts believe is worth learning. Students in this information age need to "learn how to learn" (p.

136) as they prepare for a lifetime of what will likely be a succession of jobs-and perhaps even of careers-more than they need the traditional liberal arts based education that schools offer today. The authors decry what they call "the trivial implementation of new technologies as supplements to the existing system" (p. 127), and maintain that educational leaders must undergo a paradigm shift to a new vision of school in this age of technology.

Reasons for Lack of Technology Integration

Many schools have responded to NCLB technology literacy and integration requirements by connecting projector systems, interactive white boards or slates, and classroom response systems (as well as other digital equipment) to their Internet-connected classroom computers so students can learn in environments that are most conducive to deep understanding and skill acquisition. However, too many times this equipment is observed sitting in classrooms unused (Carbonara, 2006), or even taking up space in storage rooms to get it out of teachers' way. Since much research (Goldman et al., 2006; McCoog, 2007; Schacter, 1999) has shown that technology can be effective in raising student achievement, it is important to determine why teachers are not consistently utilizing this potentially powerful tool.

One reason that some teachers do not use technology in their instruction might be a lack of confidence or competence in their ability to use them properly. For beginning teachers, even their pre-service experiences that had a technology component might have leaned toward teaching basic computer skills (e.g., word processing) and not the effective integration of technology into instruction. Moursund and Bielefeldt's (1999) study found that teacher-training programs were not providing future teachers with the kinds of

experiences necessary to prepare them to use technology effectively in their classrooms. According to the United States Department of Education (1999), in the year prior to the turn of the century, only about 20% of teachers reported feeling prepared to integrate educational technology into classroom instruction. Because those reports are now a decade old, this means that most of the teachers surveyed are now likely to be in the classroom with years of teaching experience, and only the technological skills that they have gained through staff development programs offered by or through their schools.

Fortunately, much has changed in the past decade, due in part to No Child Left Behind. The National Council for Accreditation of Teacher Education (NCATE) now includes technology integration as part of its standards for schools of teacher education. This umbrella organization, which approves or denies accreditation to teacher preparation schools, now states that teacher candidates from its member institutions should be able to "select and develop instructional strategies and technologies, based on research and experience, that help all students learn" (NCATE, 2009, p. 17).

Even if teachers do discover an exciting new technology that they would like to use and that they can actually obtain for their classrooms, the issue of time to receive training in that technology, as well as someone to deliver that training, comes into play. One study cited a National Center for Education Statistics (NCES) survey in which the vast majority (82%) of teacher respondents named lack of release time (time outside of the classroom) for learning, practicing, or planning technology integration as the greatest barrier to their use of computers and the Internet in the classroom (United States Department of Education, 2000). Gorder (2009) found similar obstacles to effective technology integration in her study almost 10 years later. In Gorder's study following up

on a South Dakota professional development initiative, the researcher determined that even after teachers had been trained in technology use and integration, they were stronger as users and facilitators of technology than they were integrationists. Teachers surveyed in Gorder's study identified the two greatest barriers as time to learn and implement the technology, as well as time to develop, implement, and communicate with students. In addition to the presence of up-to-date computer equipment, the greatest aid to technology integration, as agreed upon by the respondents, was support by school administration.

Ringstaff and Kelley (2002) found that many teachers' efforts to use technology stalled due to lack of technology support (especially in the early stages of implementation) and instructional support (after they have come to understand the fundamentals and need more expert guidance with the technology that they are using). Another study gathered evidence that teachers had not received enough technology-focused professional development and that what was offered was too basic and too generic (United States Department of Education, 2000). White et al. (2002) concurred, adding that the lack of administrative support, in addition to follow-up support, can derail an otherwise promising future for technology implementation.

Administrative Leadership in Technology Integration

If teachers are going to meet the technology standards developed by ISTE and become adept at using the technology available to them, they must have assistance in gaining those skills. While ISTE recognizes the importance of technology facilitators and technology leaders, much of the onus is placed on the school administrator. ISTE has identified National Educational Technology Standards (NETS-A) and Performance Indicators for Administrators based on the following five areas vital to effective

technology integration: 1) Visionary Leadership; 2) Digital-Age Learning Culture; 3) Excellence in Professional Practice; 4) Systematic Improvement; and, 5) Digital Citizenship (ISTE, 2009). These form the core competencies necessary for leaders to bring teachers to proficiency on the NETS-T for teachers, and thereby provide the engaging environment needed for students to realize their potential in meeting the NETS-S standards for students.

Hoerr (2005) contended that school leaders need to become comfortable with technology so that they can use technology in their leadership endeavors, as well as model its use for others. Of perhaps equal importance regarding this comfort level, according to Hoerr, is the need for school leaders to know when technology is being overused or used improperly. Gerard, Bowyer, and Linn (2007) echoed that active involvement by school leaders (in this case, principals) benefited not only the technology implementation itself and, therefore, the learning that was enhanced because of it, but it also strengthened the leadership ability of the individuals studied. According to these researchers, principals recognized that their knowledge of educational technology was critical to their ability to provide more effective leadership. The initiative shown by the leaders to provide direction in this important area enriched the students, the teachers, and the leaders, resulting in a classic "win-win" situation—a "habit of highly effective people" unearthed by Covey (1989).

When educational leaders are the primary change agents in such venues as technology integration, they are perhaps better equipped than anyone to keep it in perspective (Creighton, 2003). A very real danger when considering any new education tool is that it might take the focus away from the school's "hedgehog concept," which

Collins (2001) described as a single, unifying and guiding principle or concept, as opposed to diffused and scattered ends that take focus away from what needs to remain the locus of an organization. Creighton (2003) pointed out that throughout all the phases of instructional technology implementation, the leader must keep "teaching and student learning as the guide and driving force behind it all" (p. 3). White et al. (2002) warned that computer-based technology should be recognized as simply a means, not an end unto itself, just like more basic classroom tools such as pencil and paper. Its power, according to the authors, lies not in the implement itself, but in how it is used. If educators remain focused too much on the technology itself, cautioned Rosenberg (2000), and not enough on how effectively it is used, those who attempt technology integration will continue to fall short. He added that "without the strategic thread that holds it all together, based on 'why do it,' not just 'how to do it,' most programs have been minimally impactful and/or short-lived at best" (p. xvi).

School leaders are also more apt to act as big picture visionaries who can most effectively engage in long-term planning for technology integration instead of planning based on what they see at the latest leadership meeting or read about in the latest edition of their professional journal. Honey et al. (2005) recommended that education technology planners not look first to the technologies themselves, but first "identify specific curricula, practices, skills, attitudes, and policies that can be enhanced through the use of technology to foster significant improvement in the character and quality of student learning" (Action Options section, bullet 6). Furthermore, they stated that when instructional technology planners develop a vision of how technology can improve teaching and learning, "essential to this vision is an emphasis on meaningful, engaged learning with technology,

in which students are actively involved in the learning process" (Implications section, para. 4).

Technology by itself is not adequate to create or sustain school improvement. It should, asserted White et al. (2002), be seen as but one piece of the puzzle, accompanied by other classroom, school, and district level reforms. This observation corroborated the research findings of Collins (2001), who found that "When used right, technology becomes an *accelerator* of momentum, not a creator of it. …you cannot make good use of technology until you know which technologies are relevant" (pp. 152-153). Similarly, Creighton (2003) made the following observation about effective technology leadership:

> The principal as technology leader blends the goals of technology implementation into the total mix of instructional leadership. This will maximize the benefits of technology and guard against separating the use of technology in our schools from a focus on the overall improvement of teaching and learning. (p. 88)

Not only does technology sometimes fail to accelerate the momentum of an organization, but sometimes it just does not live up to its promise (or hype). Matzen and Edmunds (2007) found that technology did not transform some teachers from their more traditional approach to more constructivist methods as had been hoped and expected. These teachers just adapted the technology for use in their extant teaching styles, while others did adopt more constructivist approaches in their technology use. The researchers theorized that the difference might be explained by the diverse methods of professional learning that were used.

According to Gorder (2009), technology integration still needs to continue as a focus of professional development in the classroom, even for teachers who have been

trained in the process. She pointed out that new technology tools are being created, and technology continues to change and evolve, so it is imperative that teachers stay up-to-date. Gorder asserted that, especially since teachers trained in technology use, facilitation, and integration still identify themselves more as technology users or facilitators than true technology integrationists, they must continue learning and finding strategies for technology integration in the classroom.

Since delivery methods could have such a strong impact on the efficacy of professional learning, it is important to determine who makes decisions regarding which personnel receive professional learning in the use of instructional technology, when they get it, and how it is delivered to them. A report by Hezel Associates (2007) showed that school principals were primarily responsible for what professional learning was secured, and, therefore, principals had a great deal of control over these areas.

Research Regarding Administrative Leadership of Technology

Studies (Goldman et al., 2006; ISTE, 2008b; McCoog, 2007; Schacter, 1999) are available regarding the benefits of technology in the classroom. Researchers and practitioners recognize and write about the importance of leadership from school administrators in ensuring that technology is being used appropriately and effectively (Creighton, 2003; Hoerr, 2005). However, very little actual research could be found regarding the various facets of educational leader's roles with regard to effective classroom technology integration. While now dated, Anderson (2000) discussed what roles leadership played in technology integration, and determined that technology leadership had a significant and positive correlation with each of its measured outcomes. Gerard et al.'s (2007) research, while being insightful, is really more specific to

technology-enhanced science instruction. More general research into building leaders' involvement in technology integration would benefit the educational leadership community.

Chapter Summary

Today's students have grown up using technology to the extent that they are very comfortable with it, and studies have demonstrated that thoughtful integration of technology in the classroom can have positive effects on student achievement. This technology use can also assist students in their quest to meet the technology standards set forth by the International Society for Technology in Education (ISTE). ISTE has also created technology standards for teachers, but many educators have met with a number of obstacles to the use of technology (e.g., time constraints, lack of training). Administrators have ISTE standards of their own, and meeting these standards will not only strengthen the leaders' position, it will also help to bring teachers to proficiency in their technological endeavors, and will ultimately benefit students. Research that illuminates various facets of principals' roles as effective building-level technology leaders will help to inform educational practice, as a body of best practices will be created that can enable other leaders to themselves become effective technology leaders.

CHAPTER 3

METHODS

While a preponderance of the research into educational technology shows that use of technology enhances education (Goldman et al., 2006; McCoog, 2007; Schacter, 1999), other studies (Cuban, 2001) indicate that such integration happens inconsistently. Additionally, more research (Gorder, 2009) is being done emphasizing the need for technology integration to be done completely and appropriately in order for it to create significant gains in student achievement. Teachers have so many professional development needs that it is difficult for many of them to gain the knowledge and skills they need to use technology effectively in their classrooms. Therefore, school principals need to be effective technology leaders who provide an environment wherein teachers can become proficient technology integrators for their students.

In the current study, the researcher attempted to determine what practices were used by effective technology leaders to foster an environment where technology integration is implemented effectively. This chapter will present the structure and organization of the research that was undertaken to identify these practices. The methods and procedures by which the information was obtained, analyzed, and reported will also be presented.

Research Questions

In the current study, the researcher sought to identify behaviors that building administrators used to provide effective technology leadership to teachers in their schools. The following overarching question was addressed: What leadership behaviors are exhibited by Georgia public elementary school principals that enable technology

integration in the classroom? The research was guided further by the following sub-questions:

1. How do principals in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
2. How do teachers in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

Research Design

A qualitative, case study research design was employed by the researcher in the current study. Principals and teachers took part in standard, open-ended format interviews (Gall et al., 2007) that sought to determine what techniques and strategies leaders used to foster an environment of effective technology integration in their classrooms. Demographic data were also obtained through this interview process, and the researcher asked for supporting data through additional materials (e.g., professional learning handouts and/or notes).

Qualitative design was deemed most appropriate to gather the information sought by the researcher, as a clear understanding of the strategies and techniques used by effective technology leaders can be best described through the interview process (Glesne, 2006). A standard open-ended interview format was employed to help ensure that unbiased data were obtained with consistency across all interviewees. The researcher asked the same questions of all interviewees in each group (e.g., principals, teachers), but allowed for flexibility to the extent that clarity could be obtained through gentle probing and requests for clarification when needed (Glesne, 2006). Because a variety of data collection procedures can bring more rich data than interview only (Creswell, 2008), the

researcher sought to obtain other data through other sources of evidence. The principals and teachers were asked to bring any documents that they could find to spotlight the leadership techniques in technology integration provided by the principals. Data obtained through these means were compared and contrasted with the information gained through the interviews (Gall et al., 2007).

Methods

Sample and Sampling Techniques

The population for this study was elementary school principals and teachers from a RESA in the Southeast Georgia region. The RESA was comprised of school systems that were generally demographically representative of the rest of the state. There were about two dozen elementary schools in this RESA area (not counting the elementary schools in the researcher's home school district). Therefore, the top principals identified as technology leaders were chosen from a pool of 24 elementary school principals, and the teachers were selected from approximately 900 teachers in this RESA's elementary schools.

The portion of the population that participated in this research were elementary school principals who were identified as having exhibited high levels of effective leadership in technology integration, and three teachers who worked in those principals' schools. The principals were identified by professional educators from outside agencies (the local Regional Educational Service Agency, or RESA, and the local Educational Technology Center, or ETC) who had an outsider's perspective and, therefore, could gauge a school's effective use of technology in comparison with other schools of similar size and demographics. Personnel from these agencies were asked to assess the schools

based on their observations of classrooms, teachers, and leader interactions in informal settings as well as in more formal milieus such as "Georgia Assessment of Performance on School Standards" (GAPSS) Analyses. In addition, these personnel (from RESA and ETC) were provided with the seven conditions that the International Society for Technology in Education (ISTE) has found are important to ensure high quality technology implementation (ISTE, 2008b), to use as a basis for identifying these leaders. The researcher discussed with these principals his willingness to share the results of the study with them, predicting that principals who have already emphasized technology integration would likely be interested in obtaining results highlighting not only the effective practices that had made them effective technology leaders, but also techniques and strategies that others had found to foster an environment of quality technology use as well.

The researcher sought the participation of public elementary school principals and teachers in the area served by a particular RESA in southeast Georgia. Since the geographic location of this sample made it convenient for the researcher to access the participants, this study utilized the technique of convenience sampling (Gall et al., 2007). The primary sampling technique employed in this study was purposeful intensity sampling (Gall et al., 2007), as the principals were selected based on the fact that they manifested high levels of quality technology leadership.

In order to find school leaders who met this criterion, RESA and ETC personnel were asked to supply the researcher with a list of principals who had done an exceptional job at enabling the integration of technology in their schools. From among those principals named, the researcher interviewed the first three who agreed to participate, as

well as three of each of those principals' teachers. The teachers were chosen from those who were at the schools during the summer. In addition, evidence from other sources such as professional learning documents were requested from each principal and school in order to support the interviews and help to establish triangulation of the data (Glesne, 2006). These rich data from such diverse sources helped to build a coherent justification for the themes that emerged in the data analysis process (Creswell, 2008).

Instrumentation

The interview questions were derived from the research questions, and were based on the literature that was reviewed for this study. Specifically, a definitive work by an organization that is reputed to be an authority in the field of educational technology is "Technology and Student Achievement: The Indelible Link" by the International Society for Technology in Education (ISTE, 2008b). This document highlighted seven factors that research has shown to be important for successful technology implementation. Using the overarching research question as a foundation, the researcher created the interview questions based on these seven conditions (see Appendix A).

Pilot Study

A pilot study was conducted in order to determine face validity, as well as appropriateness and effectiveness, of the instruments (Glesne, 2006). The researcher asked his principal colleagues in his home system, various members of his doctoral cohort, and other educators with strong technology backgrounds, to provide feedback regarding the interview questions and the procedures planned for the study. This information was used to modify and improve the instrument and procedures used in the actual research.

Data Collection

The invitations to participate, including the nature and purpose of the study and the statement of IRB approval, were e-mailed to the principals. Follow-up e-mails were occasionally necessary when principals did not respond appropriately or in a timely manner. When participants had been determined, interview dates and times were scheduled at times mutually convenient to the interviewer and interviewees. Participants were also requested to sign an informed consent document prior to the interviews (see Appendix B). The school principals, in addition to agreeing to participate themselves, also gave approval for their teachers to participate. Research was conducted through interviews that the researcher audio-recorded for later transcription and analysis. These interviews were recorded on two separate devices to ensure that at least one good recording of the proceedings was made. The interviews were then transcribed into printed form to facilitate ease and accuracy of analysis. After the transcriptions were completed, the researcher e-mailed each participant with a request to check the transcripts for accuracy of content, as well as to provide documents to support information obtained in the interviews. Member checking (Gall et al., 2007) is a means used to ensure that the participants' perspectives reported are correct and complete.

Data Analysis

The researcher conducted an interpretational analysis of the data (Gall et al., 2007) as he collected the data. Rudimentary coding schemes and a preliminary coding list were developed, based on the literature reviewed in Chapter II, before the interviews began. These coding schemes and the coding list were refined as patterns were identified (Glesne, 2006) and themes were developed (Creswell, 2008) resulting from analysis of further data

as they were obtained. Patterns and themes were identified and developed as the researcher noted certain terms and phrases—as well as ideas—repeated by numerous respondents, and as the various responses were compared and contrasted. Data from the various sources were triangulated to determine how congruent or inconsistent they were in relation to each other (Creswell, 2008; Gall et al., 2007). Presentation of findings were made of analysis from all three levels: data from all principals; data from all teachers; and, data from each set of principal and teachers.

Reporting the Data

Sample sections in the form of direct quotes that most clearly represented the final coding list and schemes are included in Chapter IV, intertwined with the researcher's interpretations (Creswell, 2008). Other text information is displayed as matrices and in other tabular designs, and patterns that emerged are displayed in more visually representative forms such as bar or line graphs (Glesne, 2006).

Chapter Summary

The purpose of this qualitative study was to identify actions and practices that effective technology leaders at the building level used to facilitate technology integration in elementary school classrooms. The technique of purposeful intensity sampling was employed to select three elementary principals from a specific region of Georgia who had been recognized by personnel from that RESA and ETC as effective technology implementation leaders. The researcher then chose three teachers from each of those principals' schools. These principals and teachers were interviewed utilizing the standard open-ended format, using a set of questions created by the researcher based on a review of the literature and addressing the research questions. Principals and teachers were also

encouraged to bring other evidence—in the form of documents and other information—to reinforce interview data on practices performed by the principals. The results obtained were triangulated to compare and contrast data from each set of principal and teachers, all principals, all teachers, and all principals and teachers.

CHAPTER 4

REPORT OF DATA AND DATA ANALYSIS

There is a sizeable body of extant research (Goldman et al., 2006; ISTE, 2008b; McCoog, 2007; Schacter, 1999) that has linked effective use of educational technology in the classroom to increased student achievement. Some research (Creighton, 2003; Gerard et al., 2007; Hoerr, 2005; Honey et al., 2005; ISTE, 2008b; ISTE, 2009; Rosenburg, 2000; White et al., 2002) has also pointed to effective leadership by school-level administrators as an important factor in successful technology integration. Since there is a relative dearth of studies regarding principals' roles—specifically elementary principals' roles—in leading technology integration, the researcher sought to unearth the actions and practices exhibited by elementary principals who had been identified as top technology leaders.

Research Questions

In order to discover the practices exhibited by the principals who participated in the study, the following overarching question provided the focus of this study: What leadership behaviors are exhibited by Georgia public elementary school principals that enable technology integration in the classroom? To provide guidance in the research, the following sub-questions were used:

1. How do principals in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
2. How do teachers in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

Research Design

The research incorporated multiple-case study design using purposeful, intensity sampling (Gall et al., 2007). Personnel from the local Regional Educational Service Center (RESA) and Educational Technology Center (ETC) supplied the researcher with names of Georgia elementary school principals in that region who they perceived exhibited skill in leading technology integration in their schools. The three principals and three each of their teachers were interviewed using a researcher-developed questionnaire, and data were analyzed to identify patterns and develop themes. Analysis was performed on all data from principal interviews, all data from teacher interviews, and then a separate analysis was performed on the data from the principal and all teachers of each school in order to confirm findings. Finally, an analysis was performed across all participants.

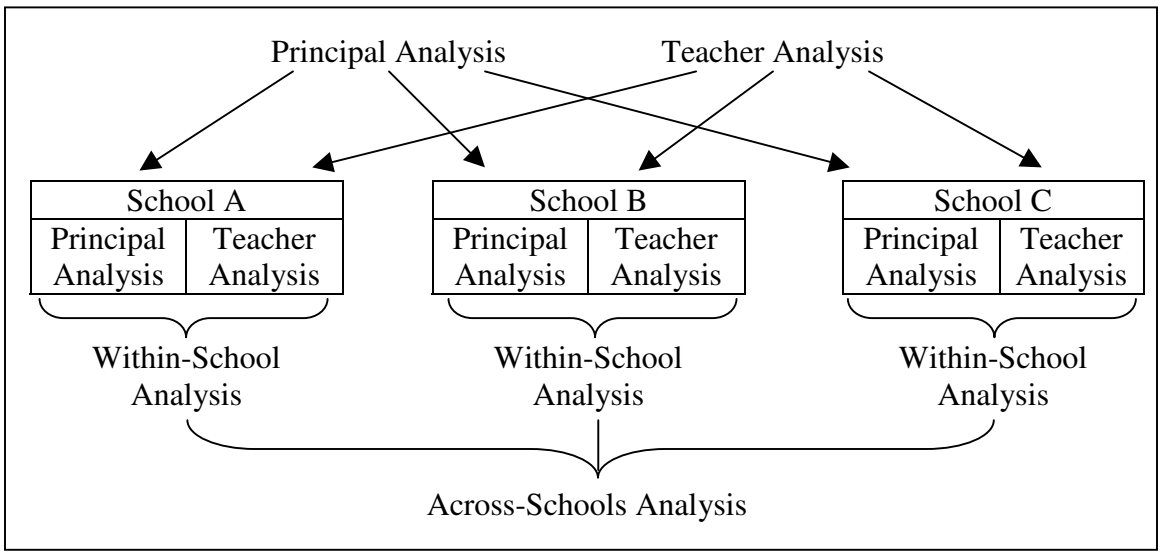

Figure 1. Interrelation of analyses across the four groups: principals, teachers, sets of principal and teachers from each school (within-school analysis), and all participants (across-school analysis).

Respondents

In order to protect the anonymity of the participants, pseudonyms were assigned, and these pseudonyms were designed to link the participants by school. The first principal interviewed was named Dr. Armstrong, and his teachers Aimee, Ann, and Ava. The second group of teachers were named Beth, Bill, and Bobbie, and their leader was named Ms. Brubeck. Mr. Carter led the third school, and his teachers Carla, Celeste, and Christy were interviewed for this study. Genders and titles (e.g., Dr., Mr., Ms.) of some of the participants were changed as well. Finally, the schools themselves were given different names using the same lettering convention—Adams Elementary, Buchanan Elementary, and Cleveland Elementary.

Adams Elementary included a principal—Dr. Armstrong—who had been in that position at Adams Elementary for three years. The teachers interviewed had all spent their entire teaching careers at Adams, having served students there for 17, four, and two years. The principal at Buchanan Elementary, Ms. Brubeck, had spent her whole time as a principal in her current school, having been at Buchanan in that capacity for eight years. None of Buchanan's teachers had spent their entire careers there. Beth had been teaching for 22 years, nine of them at Buchanan. Bill was a 36-year veteran, with 32 of those years at Buchanan. Additionally, the last 15 years of Bobbie's 28-year career had been spent at Buchanan Elementary. At Cleveland Elementary, the principal (Mr. Carter) had been there for all three years that he had served in that role. The first two teachers interviewed, Carla and Celeste, had spent the totality of their careers in this school, having taught for ten and 15 years. Christy had been at Cleveland Elementary for the last five years of her seven-year professional life.

The average number of years that the principals had served as principals, then, was four and two-thirds years, and all of them had been at their respective schools for all of the time they had been principals. Teachers had been in their roles for an average of 15 and two-thirds years, and had been teaching at their current schools for an average of just over 12 years. All participants in this study were Caucasian. Two male principals and one female principal participated in the research, while only one of the nine teachers was male.

Findings

Principals' Perceptions of their Roles

The first research sub-question that guided this study addressed principals' perceptions of their roles in effectively implementing classroom technology integration in their schools. An analysis of data resulted in the emergence of three main themes: obtaining hardware, software, and training; communicating expectations for technology use; and, defining what was considered effective use of technology.

One thread that the principals had in common was an emphasis on provision of equipment and training. Dr. Armstrong pointed out that not too many years ago, many of his students had to be taught the fundamentals of computers, while now almost of them have a great deal of experience with computers before they ever come to school. He knew that his students would succeed in using the technology because of their backgrounds, and was confident in his teachers' abilities to adapt to its use as well, because, as he asserted, "what I've found is that when you give teachers the tools, the technology they need, they take off." These leaders had taken funds obtained through federal grants, Title I funds, or their district's Special Purpose Local Option Sales Tax (SPLOST) and funneled them toward technology. Mr. Carter supplied the researcher with the budget for his "math

grant" that he obtained through Title II-D funds, which supported the idea—obtained in the interviews—that principals had sought funding opportunities through various means. Obtaining the hardware and software was important, but all principals also pointed out that training was provided as well. The companies that supplied the equipment provided some of this instruction, and Dr. Armstrong brought in personnel from the local Regional Educational Service Agency (RESA) and Educational Technology Center (ETC). In Ms. Brubeck's school they were fortunate enough to be able to engage the services of a system Instructional Technology Specialist (ITS). This principal exhibited some degree of frustration that the ITS had recently been "pulled" more to serve in other places, thereby substantially decreasing the amount of technology training provided. She pointed out that this ITS provided more than knowledge of the mechanics of the equipment (how to use it)—he also provided continuing training to teachers "on the use of the SMART Boards, programs, and how to integrate the technology into the classrooms." Dr. Armstrong stated that a trainer brought in for that faculty "did a good job of saying 'Let me see what your curriculum is and let me show you… all the different stuff you can do with this.'" Mr. Carter emphasized a couple of times that their training emphasized backward design—beginning with the end in mind.

Another idea that all of the principals accentuated was that of setting leadership expectations. While Ms. Brubeck said, "give them a little bit of training and they'll go with it," and Dr. Armstrong stated, "the main thing is, you introduce it to them, get out of the way and watch them go with it," none of the principals just relied on their teachers to do it on their own. They all indicated that they checked on teachers' use of technology in a number of ways, including lesson and unit plans, information from website usage and

data reports, focus walks (a.k.a., "walkthrough"), and informal and formal teacher observations. There were reports of having to encourage and reinforce this use more with certain groups of teachers (e.g., older teachers), and suggestions that there tended to be more reticence related to certain equipment (e.g., student response systems) than with other technology (e.g., interactive white boards). As Mr. Carter summarized, "the bottom line… is making sure the teachers know their expectations." With regard to those expectations, Ms. Brubeck simply proclaimed of teachers and instructional technology, "I just expect them to integrate it into their lessons."

There was a great deal of discussion regarding technology integration (TI), and much of it illuminated the principals' perspectives regarding what effective use of TI really means. Dr. Armstrong indicated that he had concerns, soon after having an interactive white board installed, that a teacher might use it as a "glorified TV" (only using it to show movies). Even though some of the descriptions of technology use included tasks that could be described as using projection systems as "glorified overhead projectors," these leaders frequently referred to their promotion of technology utilization at a higher level. One of the consistent and pervasive emphases was students actively doing things—for example, physically interacting with the technology. For instance, whereas worksheets formerly were used to practice skills, Dr. Armstrong lauded interactive white boards as tools that provided objects students "can actually feel and touch and move and manipulate."

The capability of various technologies to serve as assessments was heralded by the principals. For instance, one web-based program was used as an example of an effective diagnostic piece, while classroom response systems were touted as excellent means of

formatively assessing students' knowledge. These, along with other programs and web sites, were also hailed as exemplars of technology-enabled individualization. This individualization is especially useful, pointed out Dr. Armstrong, when teachers are providing support for students with disabilities or other struggling students who are placed into the Response to Intervention (RTI) process. Whereas traditional methods of formative assessment often bring attention to those students who do poorly, technology can allow them to try their best with only the teacher knowing who is responsible for inadequate responses. Lowering the "pressure" for those students empowers them to step out and try, instead of learning to play the game of trying to hide their ignorance in the classroom. With the teacher receiving almost immediate data, that also means that these students can receive attention before bad information (knowledge) or bad habits (skills) can take root.

Some of the interview questions did not seem to be as easy to answer, nor did examples seem as readily available. With regard to problem-solving skills, for instance, Ms. Brubeck seemed to struggle to identify technology that addressed that concept. Dr. Armstrong discussed it, but spoke very generically about it (citing the use of interactive white boards). Mr. Carter indicated that the school had access to a program that was specifically designed to address problem-solving skills in math, and was able to discuss the issue more thoroughly. Students in that school had employed this program, for example, to plot a garden (calculating area and perimeter) and plan a party (design and purchase decorations and the menu). A third grade math problem solving unit supplied by Mr. Carter supported this effective use of technology. Finally, Ms. Brubeck gave an example of simulation by highlighting that school system's capability, through some new

technology they had obtained, to offer their students the capability of linking with an aquarium and interacting with a SCUBA diver in a fish tank. The other interviewees seemed unable to provide examples of simulations in their schools.

Teachers' Perceptions of their Principals' Roles

With the second research sub-question that guided this study, the researcher sought to glean teachers' perceptions of their principals' roles in bringing about effective classroom technology integration in their schools. Analysis of teacher interviews brought out three main themes: encouragement, enthusiasm, and support from the principals for technology use in the classroom; the principals' willingness and ability to provide needed educational technology hardware, software, and training; and, how these leaders sought to ensure the desired amount and type of technology integration in their teachers' classrooms.

While some questions lent themselves to teachers praising their principals for their enthusiasm and excitement for technology, as well as their encouragement and support, participating teachers often continued the adulation throughout the interviews. Aimee stated that Dr. Armstrong's leadership in this realm was "almost like a mother nurturing her child." Ann observed that "his enthusiasm kind of translates over to the kids," adding that when he comes into a classroom he gets so excited that the students do too. This principal was described by Ava as a "technology guru," and added that he has created a school culture where technology use is expected and encouraged. While "enthusiastic" and "excited" were not words used to describe Ms. Brubeck's attitude toward technology, "supportive" and "encouraging" certainly were. She was described by Bobbie as a "great leader" who encouraged her teachers to be "technology savvy." Likewise, Mr. Carter's

teachers pointed out that he does a lot of modeling of technology use, and Celeste called him "a jam-up leader" who is very supportive in this area.

Teachers, along with their principals, understood that students came to school with a great deal of experience with technology. Amy expressed that with all of the "videos, games, and all that they play at home, they've got to have something to interact with… at school." While obtaining technology and training was a recurring theme, teachers' responses seemed to reflect that each principal had a different role in that provision. Ms. Brubeck was the school leader who was fortunate enough to have a system-level technology specialist scheduled to provide biweekly training in both hardware and software usage and integration into the curriculum. Her system had also equipped all classrooms with 21st Century Classroom equipment (interactive white board, student response systems, wireless slates, document cameras, audio systems, and projectors), yet she was still considered—to a degree—the technology leader in the school, and the person responsible for supplying needed hardware, software, and training. According to Beth, "[Ms. Brubeck] provides someone to come in and train us" in appropriate use of technology. Mr. Carter's teachers did not receive as much from the system level, so they had to rely on him to provide technology using state and federal funds over which he had some degree of control. Carla asserted that he "stays on top of the latest technology" and, according to Christy, he is "very willing to subscribe to whatever, if he knows that it's going to benefit the teachers and the students." A similar sentiment was heralded by Aimee when she emphasized that Dr. Armstrong is "going to do whatever it takes to make sure that we have the latest technology that we can afford… that would be beneficial to

the teachers." Ava believed that he had already "given us all of the technology that we could possibly ask for at this point, really and truly."

Throughout the interviews, teachers expounded on the methods these leaders used to ensure that the available instructional technology was being used enough, and was bringing about desired results through appropriate use. One thing that came across frequently was the expectation that technology was going to be used in the classrooms in these schools. Speaking of the need to use technology in their classrooms, Ava said that Dr. Armstrong was "telling us that continuously… through faculty meetings, e-mails." Beyond the setting of this new norm, all of the principals also checked lesson plans and/or unit plans for inclusion of technology components into daily instruction. In addition, they utilized checklists or other evaluation instruments as they performed teacher observations and "walkthroughs." These observations were done formatively, even including other personnel (e.g., a leadership team) in walkthroughs, as well as through summative observations used for teachers' evaluations. Between the encouragement, the provision of hardware, software, and training, and efforts of principals to ensure adequate technology use, the teachers seemed relatively confident that technology was being used often and effectively throughout the school. Bill asserted that in Ms. Brubeck's school it was "used in every classroom every day," and that equipment like the interactive white board "is to be integrated into every [Georgia Performance Standard] that we have." Again, Ava described this as the new culture of her school, and Ann added that Dr. Armstrong was excellent at "building that community" of colleagues who helped one another become proficient in using instructional technology.

While teachers' enthusiasm for the technology that they were provided sometimes translated into spirited appreciation for their principals, it did not always bring about an understanding of the principals' role in facilitating technology integration. At times, teachers expressed their thoughts about how they and their colleagues implemented various technologies, but did not respond to the main point of the questions—what their principals did to bring about this implementation. Even after redirection and clarification by the researcher, teachers sometimes could not provide insights into their principals' roles in this process. For example, when asked about how her principal ensured alignment of technology to curriculum standards, Carla finally stated, "I'm not sure. If I can think on it a minute I can come back to it," but she never did. Celeste responded to a question regarding in what ways her principal encouraged collaborative settings in technology use, "I don't recall, as far as that being something that he's implied that we need to do." She also interrupted her own answer (to another question) at one point by saying "because I'm positive it's covered, but I'm positive I'm not giving you the correct answer."

With respect to scheduling technology use, Beth spoke at length about how she used it in the classroom every day, but even after some clarification, she made no mention of Ms. Brubeck's role. Aimee's "mother nurturing her child" statement was in the midst of a long description of Dr. Armstrong's provision of technology, and his encouragement and enthusiasm toward it, but the question asked—regarding technology providing simulations, multimedia, and lessons based on problem-solving skills—remained essentially unanswered by her. Spawned by this same question, and similarly unrelated to the topic, was Ava's assertion that Dr. Armstrong had provided for the teachers "all of the technology that we could possibly ask for…."

Within-School Analysis

Adams Elementary School.

Dr. Armstrong, principal of Adams Elementary School, led the charge toward technology integration because of personal conviction and interest in it. "My job is to make the technology available. I think personally, because I like technology, I think it's my job to be invested in it," was his explanation of his leadership in this realm. His teachers seemed to understand his investment, and his enthusiasm was communicated as desire to help children through integrating these technologies. Aimee stated during her interview that "he's purchased all of the technology for us" and "he's going to do whatever it takes to make sure that we have the latest technology that we can afford… that would be beneficial to the teachers." She also understood the source of his enthusiasm and support when she stated that "he loves technology; that's his thing. He loves technology, he loves children, and he wants the best for them." Ann said of new technology that Dr. Armstrong provided that "he's so excited about it… he wants to come into your room and show you, and show everybody what we've got and what it can do, and the way… that we can use it best." Ava proclaimed that Adams Elementary incorporated technology more than a lot of schools "because of our principal, because he incorporates it and he thinks it's so powerful to our students."

The principal indicated that he had to work harder with some of "the older teachers" due to their hesitance in tackling the new technologies. He even admitted that he had to "put a little pressure on them" recently. Aimee also alluded to this when she spoke of teachers who were "kind of from the old school" and did not want to adopt technology in their classrooms. While she said that Dr. Armstrong "kind of pushes the

older, the old school teachers into the new age of teaching," she added that "it's not a pushy style… he's not one of these that's really hard, 'yeah, you're gonna do this or else.'" In fact, Ava actually averred that Adams Elementary teachers were "very lucky to have a principal that does push that toward our classrooms." Ann emphasized that he conducted observations to make sure teachers were doing it (integration) the best way it could be done, and when he found exemplary teachers, he was "really great about… bragging on them and having other teachers come in and watch them… He's really great about that, sharing and… building that community."

Dr. Armstrong was wary of inappropriate and ineffective use of this technology, as characterized by his concern that the interactive white board would be used as a "glorified TV." He pointed to proactive training that was supplied to the teachers as the main way this was avoided. The training was in three parts, with pre-training, then more training once the equipment was in place, "and then after a month and a half we actually brought the trainer back in and they were making practical application." However, Ann seemed to remember that Dr. Armstrong and his assistant principal had to provide more intervention to ensure appropriate usage. She stated that, in addition to some teachers not employing the technology at all, some teachers were initially using the interactive white boards as "glorified overhead projector things" and that others "would just stand at the front and no longer do the walking and the circulation" needed to engage and monitor all learners. She concluded that "it took a lot of [administrators] coming in to make [teachers] use [the interactive white boards]."

Many of the questions in the interviews had to do with how the principals ensured various types of technology usage (e.g., curriculum alignment, collaborative settings).

Each of the teachers at Adams Elementary responded to many of these questions by noting how Dr. Armstrong used walkthroughs or teacher observations. Aimee also pointed out that he checks lesson plans for technology components, and that teachers are required to turn in reports of technology usage, as well as data from benchmarks and other instruments. The principal himself made little mention of these, only discussing walkthroughs in the last few sentences of the interview. He did mention lesson plans a little more often, however, and added that he was aware of technology usage through their unit plans as well.

Buchanan Elementary School.

Ms. Brubeck did not have to obtain hardware for the teachers of Buchanan Elementary, as it was provided for teachers in all of the district schools as a system initiative. In addition, much of the training was supplied for them as well, through their system Instructional Technology Specialist (ITS). However, Ms. Brubeck was still considered to be the one who provided the training that her ITS delivered, as both she and Beth pointed out. Bill also mentioned that Ms. Brubeck was the one who obtained the software they use, such as the example he used that provided individualized feedback.

The Buchanan Elementary principal said that she set or communicated expectations through the professional learning that she provides, as well as honest assessments on technology elements using the teacher evaluation instrument. She also added simply, "I encourage teachers." Ms. Buchanan's teachers did not cite the words "excitement" or "enthusiasm" when describing her interaction on the technology front, but did use various forms of the word "encourage." They also confirmed that she used observations (according to Beth, "a lot of observations") to help ensure the quality and

amount of integration. The principal herself made no mention of lesson plans, nor did Bobbie or Bill. Beth did not explicitly state that lesson plans were checked by the principal to ensure technology integration, but she did state that technology was "an element within our lesson plans, too. We put down what [technology] we are using." Ms. Buchanan did allude to a weekly usage report that she receives from a software provider that she forwards to teachers, and said that she then discusses with the grade levels regarding their students' usage. The teachers did not reference any such report or subsequent discussion.

With regard to effective integration (appropriate use) of technology, Ms. Buchanan emphasized that she expected "the students to be able to touch the [interactive white] board and interact with the board and do that." Bill confirmed that she expected to see effective usage, such as students working collaboratively with the technology, as part of her observations. Bobbie added that the principal's "expectation is it's not just for the teacher to stand up there and use it, she better see the children up there using the [interactive white] board even at [my grade] level. I mean they need to be up there manipulating the [interactive white] board themselves. They need to be manipulating and touching, working it." Bobbie also asserted that Ms. Brubeck would expect to see software lessons individualized to different students' needs at the small group level.

Cleveland Elementary School.

Cleveland Elementary School's principal, Mr. Carter, put a great deal of emphasis on the hardware, software, and training that he had procured through various funding sources. He listed interactive white boards, projection systems, computers, laptops, peripherals (e.g., printers, scanners, digital cameras), software (both locally stored and

web-based), and "a lot of professional training on implementing technology integration into the classroom." Celeste echoed that sentiment, emphasizing that Mr. Carter "makes sure we have those funds."

Mr. Carter appeared quite conscientious about ensuring that technology was used in the classrooms, and used effectively. He admitted that he went into various software programs "to look at teacher reports to see how many students have been assigned to this science domain, how many in the math, and I print out those reports." He does not just spy on his teachers, though, but uses the information he gathers to encourage and gently prod his teachers to use the programs more, and more effectively. When he forwards reports to teachers, he will often add positive comments to further motivate them. Celeste and Carla both spoke of supplying Mr. Carter with reports, or having reports forwarded to them by him, complete with comments of encouragement and motivation.

According to this technology leader, his teachers know that he will expect to see a technology component during an observation. "It's all set for them at the beginning of the year. I mean they know what to expect." He also makes use of walkthroughs, enlisting his other administrators, leadership team, and all teachers in a peer evaluation setting in these observations as well. This is not just used for the physical observation, but also includes a lesson plan checklist that is comprised of many facets of good educational practice, including technology integration, so all teachers can see good technology integration in place, and in action. Mr. Carter provided for this study a copy of the "checklist" he used for these walkthroughs, and the researcher can confirm the presence of five different facets of technology integration on that observation instrument: direct

instruction, indirect instruction, Internet, computer software, and interactive whiteboard tools.

Carla cited the peer observation as part of the professional learning provided for the teachers at Cleveland Elementary, and discussed that when her principal does his observations, he is looking for specific effective practices, such as flexible grouping and meeting individual students' needs. She further elaborated about Dr. Carter's checklist, and the various components of it, such as whole group vs. small group vs. pairs vs. individual work, and how that correlates to the technology component on the checklist. Finally, while neither Mr. Carter nor Carla said anything about lesson plans (except for the lesson plan checklist), both Christy and Celeste (more the former than the latter) did include these as ways that their principal kept up with "documentation that technology's being incorporated."

Comparison and Contrast of Principals' and Teachers' Perceptions

The main themes that were gleaned from the principals' interviews were: P1: the role of the principal in obtaining technology hardware, software, and training; P2: setting and communicating expectations for technology use in the classroom; and P3: determining and communicating what would be considered effective use of technology. Data from teacher interviews brought about three themes as well: T1: enthusiasm, encouragement, and support from their principals regarding technology integration; T2: provision from the principal of needed technology hardware, software, and training; and T3: the manner in which principals supervised the amount and quality of technology integration in their schools. The first principal theme equates directly with the second teacher theme, and the second and third principal themes correlate generally with the third teacher theme. The

first teacher theme also relates somewhat to the second and third principal themes, insofar as the principals provide encouragement and support while they are communicating expectations for acceptable amounts and types of technology use. The principals' provision of instructional technology and training was seen as an outgrowth of their enthusiasm for it, and principals' encouragement for its use seemed to co-mingle with their supervision of teachers' implementation of it. The overlap of these themes demonstrated that teachers' perceptions helped to confirm the principals' perceptions.

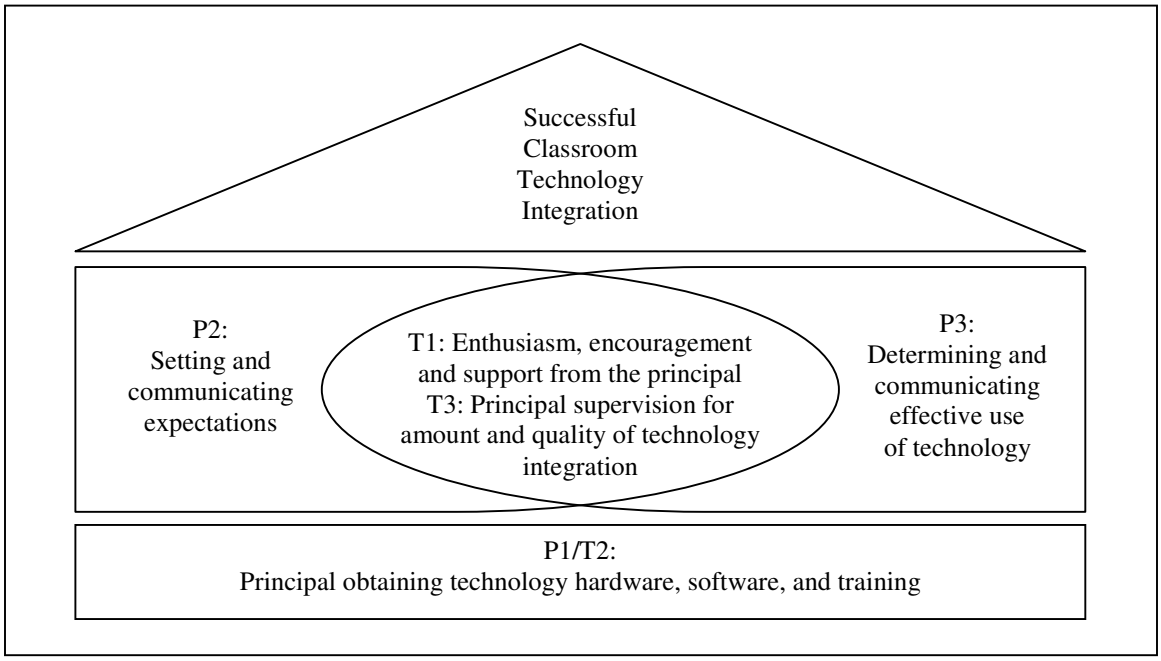

Figure 2. Interrelationship of themes gleaned from principal and teacher interviews. P1/T2 (on the bottom) was recognized by both groups, and was the foundation that made everything else possible. P2 and P3 were the essential behaviors performed by principals, but were perceived by teachers through T1 and T3. All of this led to successful technology integration.

Response to Research Questions

The first sub-question in this study was: How do principals in Georgia public elementary schools describe their role in effectively implementing classroom technology

integration in their schools? Based on analysis of the interviews with principals who had been identified as effective leaders for technology integration, three main themes emerged. First, these principals indicated that a major responsibility of their position, and a vital first step toward technology integration, was to obtain and maintain up-to-date instructional technology hardware, software, and professional learning. Obviously, technology integration cannot take place where there is no technology to integrate, or where teachers have not been properly trained. Next, they emphasized the need to set and communicate expectations for technology use in their classrooms. Those expectations had to include not only amount of use, but proper and effective use. Finally, these leaders believed that it was their responsibility to determine and communicate just what effective technology integration was. If the technology was used inappropriately or ineffectively, it would not translate into academic gains for the students; according to these principals, that would be unacceptable.

The second sub-question in this study was: How do teachers in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools? The first theme that was gleaned from analysis of the teachers' interview responses was that enthusiasm, encouragement, and support from the principal was important in ensuring that technology would be implemented in the classrooms. If that first theme resounded in the school, it was more likely that the second theme would also take place—the principal would provide the technology hardware, software, and professional learning that the teachers needed in order to implement use of instructional technology. In two of the schools, teachers believed that the principals' enthusiasm for technology gave impetus to obtaining the equipment and training.

Principal supervision for the amount and quality of technology integration was the third theme to come from the teacher interviews. These teachers, according to all of the principals, wanted to please and desired to implement the technology effectively, but needed guidance and accountability in order to live up to the expectations communicated by the principal.

The following overarching question provided the focus of this study: What leadership behaviors are exhibited by Georgia public elementary school principals that enable technology integration in the classroom? The behaviors identified by this study began with enthusiasm, encouragement, and support for instructional technology itself. When this translated into provision of hardware, software, and professional development needed to implement technology in the classroom, it laid the foundation for technology integration. Seemingly just as important, however, was the follow-up behavior after the technology was in place and the teachers had been trained in how to use it. Successful technology leaders set and communicated high expectations for both the amount and the type of technology integration that must take place in their teachers' classrooms. It was not enough that the hardware and software be used regularly, but it was perhaps more important that it be used effectively. This was yet another behavior of successful leaders—determining and communicating just what was acceptable and effective use of this equipment. Then, once those expectations and definitions of effective integration were in place, a network of accountability measures was put into place. Lesson plans were checked, administrative walkthroughs were implemented, documentation in the form of usage reports or student achievement data were obtained, and teacher observations were performed, all for the purpose of ensuring that the final result of the technology integration

was more effective teaching and increased learning. These were the behaviors exhibited by the Georgia elementary school principals studied for this research.

Chapter Summary

The participants in this study included three principals and nine teachers—one principal and three teachers each—from elementary schools in Southeast Georgia. Analysis was performed on data from all of the principals' interviews and all of the teachers' interviews, as well as the teams of principal and teachers from each school. The following three themes were gleaned from the principal interview analysis: obtaining hardware, software, and training; communicating expectations for technology use; and defining what was considered effective use of technology. Analysis of teachers interviews also resulted in three themes: the principals' encouragement, enthusiasm, and support for technology use; willingness and ability of the principal to provide needed educational technology hardware, software, and training; and how the principals sought to ensure the desired amount and type of technology integration in their teachers' classrooms. A comparison of these results highlighted one identical theme (principals' provision of technology equipment and professional development), and all of the other themes which seemed to support each other and point to similar ideas, but from different perspectives (e.g., communicating expectations, providing encouragement, enthusiasm and support for technology use). Further evidence of corroboration was provided by documentation collected from study participants.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary

In this "Age of Technology" (McCain & Jukes, 2000), children are surrounded by technology, and many educational experts (Prensky, 2001a; Tapscott, 2009) have stated that schools must adapt these same technologies to engage students in learning and make their educational experiences more interesting and relevant to their personal life experiences. Many studies have indicated that use of these technologies increase student achievement (Goldman et al., 2006; McCoog, 2007; Schacter, 1999). Unfortunately, teachers are not integrating technology consistently and pervasively into their everyday teaching (Carbonara, 2006; Gorder, 2009), often because they are not implementing it fully or properly (ISTE, 2008b). School principals can be primary agents in enabling and empowering teachers to integrate technology effectively (Creighton, 2003; Hezel Associates, 2007). However, while some research into general technology leadership practices exists (Gerard et al., 2007; Hoerr, 2005; Honey et al., 2005), little research exists that provides insight into specific behaviors of effective leaders in this realm.

The purpose of this study was to determine what actions effective technology leaders engage in to provide leadership in a way that supports and sustains technology integration among their faculties. Specifically, elementary school principals in Southeast Georgia who had been identified as positive leaders for technology implementation were studied to gather information regarding what leadership practices they used to bring about such effective technology use by their teachers. In this qualitative study, multiple-case study design and purposeful intensity sampling were incorporated using a standard, open-

ended interview format (Gall et al., 2007) to gather data from participants. Three principals and three teachers from each of these principals' schools were interviewed using questions authored by the researcher, and based primarily on research from the International Society for Technology in Education (2008b). Providing focus for the study was the following overarching question: What leadership behaviors are exhibited by Georgia public elementary school principals that enable technology integration in the classroom? Helping to add specificity to that guidance were the following sub-questions that guided the research:

1. How do principals in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
2. How do teachers in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

Analysis of Research Findings

Analysis of principal interviews showed that these school leaders focused primarily on three things: the significance of their role in obtaining hardware, software, and training for their teachers; the need for them to communicate expectations for technology use; and, the importance of defining and communicating to their teachers what was considered effective use of technology. The facets of the principals' role that the teachers considered important were gleaned from analysis of teachers' interviews. This analysis also resulted in three themes: the impact of principals' encouragement, enthusiasm, and support for technology use; the leaders' willingness and ability to provide needed educational technology hardware, software, and training; and, how the principals

sought to ensure the desired amount and type of technology integration in their teachers' classrooms.

The first principal theme (P1) and the second teacher theme (T2) were essentially a direct match, indicating that both the principals and the teachers found this to be one aspect of the principals' role on which they agreed completely. There were also correlations between the other four themes. The enthusiasm and encouraging nature of the principals (T1) seemed to have an effect on how teachers perceived the principals' role in communicating expectations for technology use (P2), and in defining what was appropriate and effective technology integration (P3). Similarly, how the principals went about ensuring the quantity and quality of technology integration in their schools (T3) was the follow up for P2 and P3. In essence, T1 and T3 were the teachers' perception of how the principals were performing their P2 and P3 roles. The fact that these themes were so intertwined verified that the perceptions of the teachers helped to confirm the perceptions of the principals.

Discussion of Research Findings

Hitlin and Rainie (2005) showed that a large majority of students were technology users at the time of their study. McHale (2005) and Prensky (2001a) asserted that since many of these students have never known a time that digital technology was not part of their personal experiences, their minds and learning processes have fundamentally changed in comparison with previous generations. Principals and teachers pointed out how experienced their students were with technology, and that they believed incorporating technology into their classrooms would engage students and improve learning.

The seminal piece of research used in this study came from a leading authority on technology integration, the International Society for Technology in Education (ISTE), which, through extensive research, identified seven factors that are key to implementing classroom technology successfully (ISTE, 2008b). The following will examine the findings of the study vis-à-vis the ISTE framework.

The first of these factors was effective professional development. Professional development in technology integration means more than just knowing how the equipment, software, etc. works, but has more to do with applying the appropriate technologies in the right contexts to enhance the teaching and learning process (Carbonara, 2006; Honey et al., 2005; Moursund & Bielefeldt, 1999). In the three schools studied, a great deal of the training provided to teachers dealt with how to use the equipment, such as interactive white boards, student response systems, and various software programs. There was "pre-training" that took place before the equipment arrived, and professional learning that trained teachers in how to use the equipment. However, in all of the schools, there also seemed to be a strong component in the professional learning that looked specifically at how the technology could fit in with the bigger picture of the instruction that was happening in the classroom.

For instance, the curriculum should be the primary consideration regarding integration of technology, according to the second of the factors. The technology itself must not be the focus, but should instead be a means of assisting student mastery of the curriculum (Honey et al., 2005; Rosenberg, 2000; White et al., 2002). An example of this appropriate focus included Ms. Brubeck's utilization of the system Instructional Technology Specialist (ITS), who came in to provide regular training for teachers, using

the actual curriculum they were teaching. In addition, Dr. Armstrong's trainers went beyond the "how-to" level and asked the teachers what lessons they needed to teach, and then fit the right technology tool to enhance the instruction. Mr. Carter's focus on curriculum was exemplified in the term he used during his interview, when he pointed out that the teachers started with the standards and would "begin with the end in mind" as they chose the best technology to employ in their instruction and assessment.

The more frequently technology is used, and the more completely it is incorporated into the daily regimen of classroom instruction, the more effective it is, according to Kulik (2003) and Middleton and Murray (1999). Principals focused on this third facet of effective technology leadership as they set expectations for the teachers' use of technology. They communicated to teachers that technology should be employed regularly, and that they should be able to see evidence of this use in teachers' lesson plans and through their observations of classroom instruction. The teachers confirmed this expectation, as well as the follow up that principals executed through those lesson plan checks and observations. The frequency of technology use was not the only expectation communicated to the teachers, though, as principals also emphasized employing equipment such as an interactive white board as more than "glorified TV." Quality use of technology, according to statements made by these technology leaders and their teachers, was every bit as important as the quantity of its use.

Quality of technology use has a great deal to do with how well teachers plan for its use in a variety of ways, in order to meet the needs of diverse learners. McCoog (2007) averred that technology can be a potent ally to differentiation of instruction and assessment, in this very important fourth condition of effective technology use. The more

teachers move away from one-size-fits-all technology to employing technologies that provide more individualized feedback and learning experiences, the more technology can live up to its potential and benefit all students, especially low performing students (Kulik, 2003; White & Frederiksen, 1998). Dr. Armstrong specifically touted classroom response systems as effective formative assessment instruments for struggling students, as they could give their best answer with anonymity, while the teacher could still have a clear picture of which students needed extra scaffolding and support. Teachers, then, receive immediate feedback and can correct misconceptions right away, and can re-form their flexible groups without delay, making intervention a great deal more effective. While the immediate feedback portion of this factor was addressed by participants, responses to technology's ability to tailor lessons to specific students were not as plentiful. A number of respondents discussed how the teachers took the individualized feedback and used it to tailor lessons on the computer, but few could identify software programs that themselves performed the customization.

Technology benefits are realized to the greatest degree when students are actively engaged and interacting with the technology (Honey et al., 2005) and when they collaborate with each other using that technology (Kulik, 2003). The active engagement encouraged in this fifth standard was a fairly consistent thread throughout the interviews. Principals spoke of its importance, and teachers indicated that principals expected to see this happening, as opposed to using the technology (in the case of an interactive white board) as a "glorified TV" or a "glorified overhead projector thing." The collaboration part of this standard produced less response, and one teacher admitted to not being able to recall any direction from her principal in this regard. Still, teachers at Adams Elementary

indicated that Dr. Armstrong did expect to see collaborative settings in his walkthroughs and teacher observations, and Mr. Carter used collaborative settings in his description of project-based learning, such as the groups of students planning the party, or planting the garden.

While many people think of drill-and-practice type programs when they hear of classroom technology implementation, research shows that these programs are not as effective in engaging students as content such as simulations, project-based learning, and real-world simulations—the sixth effective technology integration condition. Student motivation is heightened most through technology when students are engaged in a project-based approach such as creating multimedia projects based on themes (Adams & Hamm, 2008; Cradler & Cradler, 1999). There was very little feedback from principals or teachers with respect to project-based learning, and almost none regarding simulations. The only discussion that could be interpreted as having to do with simulations was when Ms. Brubeck told of the technology that enabled her students to see a SCUBA diver in an aquarium. Mr. Carter did provide some project-based learning examples, including students planting a garden, and planning a party, all as part of math units. Principals and teachers cited these and other problem-solving exercises, including a few software programs designed for this express purpose.

Leadership from the principal in modeling technology use and supporting technology initiatives is the seventh key to quality technology integration (Creighton, 2003; Hoerr, 2005; Honey et al., 2005; Ringstaff & Kelley, 2002; White et al., 2002). Principals' personal use of technology in this study seemed to include mainly presentations in faculty and staff meetings, and not applications that included some of the

more effective practices, such as interaction, collaboration, or individualization. However, there were examples of more in-depth knowledge of technology integration, such as when Dr. Armstrong was able to help teachers with their implementation, and when Ms. Brubeck brought in her IST to assist teachers with curriculum-supportive technology use. Furthermore, the support that all of these leaders provided for their teachers was key to the success that these schools, teachers, and principals have enjoyed in the realm of technology integration.

Conclusions

Effective leaders for technology integration in this study focused their efforts on three main things: obtaining technology hardware, software, and training for their teachers; setting and communicating to their teachers expectations for technology use; and, defining and communicating to their teachers what is considered effective use of technology. Teachers perceived principals' foci from a slightly different point of view. Analysis of data from teachers' interviews resulted in these three themes: how the principals' enthusiasm, encouragement, and support for technology integration affected classroom implementation; principals' provision of instructional technology (hardware, software, and training) for the classrooms; and how principals went about ensuring that teachers implemented the appropriate amount and type of instructional technology.

The point at which these two perspectives converge shows a fundamentally vital portion of technology integration–the provision of the hardware and software needed to implement it at all, and the training needed to do it effectively. The first part of this theme was not a part of the conclusions from the ISTE (2008b) study, implying that obtaining the needed hardware and software is understood as a necessary first step that must be taken to

implement instructional technology. The second part of the shared theme, however, is not as obvious, as evidenced by the fact that the very first of the seven essential factors for effective technology integration addressed professional development. Without this vital component, equipment might sit unused in classrooms, or be used quite ineffectively, giving educators a false sense of the impact technology can truly have on learning.

The quality of this professional development is every bit as important as whether it is provided at all. Training must go beyond the "how to" of working the equipment, and delve into how to choose which technologies to use in order to maximize their effectiveness. Just as certain instructional techniques seem to maximize teachers' efforts to instruct their pupils in particular knowledge and/or skills, some technologies just "fit" better than others as tools to bring about deeper understanding in students of various parts of the curriculum. Similarly, just as delving further into some instructional techniques allows teachers to learn how to use them more effectively and in a greater variety of circumstances, professional learning into technology integration can provide educators with knowledge of how to use these same technologies more effectively to individualize for students, encourage student collaboration, use in context of project-based learning, or other of the essential factors included in the ISTE (2008b) study.

Analysis of the principals' interviews showed that communication was a central concern. Principals felt the need to determine and communicate to teachers what was a reasonable (minimum) amount of technology implementation in the classroom. Further, they could not stop there, but had to provide specific guidance regarding how technology should be used. It was not good enough for these leaders to see technology used

ineffectively (e.g., as "glorified overhead projector things"), but they felt compelled to bring their faculties beyond technology use—to true technology integration.

An important finding from the teachers' point of view was the effect of the principals' enthusiasm, encouragement, and support for technology integration. While this is supported by the seventh factor of the ISTE research, there appears to be more to this finding than what was stated in that study's conclusion. "Leadership, support, and modeling" were the key words in the seventh factor, but two words that were gleaned from this current study were "enthusiasm" and "encouragement." The principals communicated their expectations to the teachers and defined for them what was considered appropriate technology use, but seemed to do it in a way that engaged teachers to want to step up and produce quality integration. The methods used by these building leaders did not seem heavy-handed, but were positive, uplifting, and enthusiastic, providing a climate that encouraged and supported technology implementation. It did not seem that these principals just stood along the sidelines as cheerleaders for technology. Instead, they infused excitement and an attitude that fostered belief that implementing classroom technology was a realistic goal, and worthy of the teachers' efforts because it would help them reap the reward of greater student achievement.

Teachers also emphasized that principals enacted a framework of supervision to ensure compliance with technology usage expectations, as well as appropriate technology use. Again, this supervision seemed to be viewed by the teachers not as "top-down," heavy-handed mandates requiring overburdening documentation, or subjecting teachers to invasive observations, but as guidelines (albeit required at times) developed to ensure successful technology integration. The principals were not afraid to "inspect what they

expect," but performed this function in a way that did not dilute the enthusiasm they had displayed, nor the encouragement or support they had provided.

Furnishing the technology hardware and software is fundamental to technology implementation, and principals who would become technology leaders must find the means to take this first step. However, the next step is just as vital, as teachers must be provided with the knowledge and skills to use the technology, as well as to effectively integrate it into the curriculum and maximize its use in the most appropriate instructional context. While it is essential that principals provide concrete guidance to teachers regarding the amount and quality of technology implementation expected in their classrooms, just as important is the climate created and maintained by these leaders throughout the process. They need to create a framework of supervision so the expectations that they have communicated are not deemed as mere suggestions. Nonetheless, successful technology leaders must supervise in such a way that makes teachers not feel that someone is constantly looking over their shoulders, but instead that someone is giving them the knowledge, skills, and deeper understanding of technology integration that they need to successfully implement instructional technology in their classrooms, thereby positively effecting student achievement.

Implications

The effective leadership behaviors uncovered in this study can serve the education profession in general, and school leaders in particular, in a profound way. Teachers are often too busy keeping up with their curriculum, classroom management, faculty and staff meetings, parent meetings, etc. to have time to devote to learning how to effectively implement instructional technology in their classrooms. Many of them will not seek

higher degrees or independent professional learning, and those degrees and staff development opportunities that are sought will likely not have rigorous technology integration components in them. Therefore, school leaders are in an ideal position to provide much-needed in-service professional development to teachers in their schools.

Simply becoming informed about the strong positive correlation between effective classroom technology integration and higher levels of student engagement and achievement ought to give impetus to a stronger desire on the part of school leaders to become effective leaders in this realm. Knowledge of the effective practices of technology integration should give these leaders an understanding of what to encourage and look for in the classrooms of their schools. But awareness of the specific leadership behaviors uncovered in this research has the potential to make these leaders truly effective in bringing about quality technology integration.

Self-motivated elementary school principals specifically, but all administrators in general, could take the insights uncovered in this research and glean from them a clearer direction for their personal growth goals. Educational leadership pre-service and in-service providers can provide for prospective and practicing administrators knowledge of specific behaviors (e.g., provision of training, including clear guidance regarding the quality of implementation, and a framework of supervision, such as observations, lesson plan checks, or walkthroughs) that have been recognized as effective in leading technology integration. RESA and ETC consultants, system technology directors and professional learning coordinators, state Department of Education staff development personnel, and the like will be able to train local school leaders in these effective practices of technology leadership. Teachers will not only be able to obtain the training necessary

to work the equipment that is obtained for them, but they will be able to continue to stay up-to-date, and exhibit a deeper understanding of effective technology integration, because their leaders will have received the knowledge and understanding they need (through the findings and conclusions drawn from this study) to provide quality professional learning for them.

Recommendations

As use of instructional technology becomes more widespread, the need for school leaders to be adept at leadership for technology integration will likely increase in importance. Therefore, research into effective leadership practices needs to continue so that teachers and students can reap the benefits of more effective technology integration. Recommendations for further research into this field include the following:

1. Analysis and further development of the survey questions might be in order. The eyes and minds of experienced researchers might find ways to tweak the questions to provide more clarity and garner more insightful and/or relevant responses.
2. Replicate this study with more people in the demographic that includes rural South Georgia Elementary School Principals and their teachers. This research is a good start, but is certainly too small for the results to be considered conclusive.
3. Expand this study to include related demographics, such as elementary school principals and teachers beyond rural South Georgia, and middle and high school principals and their teachers from throughout Georgia. There are a number of elements of technology integration that would likely be very similar in those other settings, and replication of this study into those other milieus might provide

interesting insights that could add to the body of knowledge regarding behaviors of effective technology leaders.

Dissemination

The findings from this study were disseminated in a number of ways. This dissertation has been published into a hardbound book, and a copy of it has been placed at the Zach S. Henderson library on the campus of Georgia Southern University, as well as in the Department of Leadership, Technology, and Human Development on that same campus. An electronic version has also been made available on the Internet. The researcher has made an electronic summary of the findings in this study available to the participants—principals, teachers, and personnel from the researcher's RESA and ETC—in the study. He has also discussed with personnel from these training agencies (RESA and ETC) his availability to assist in providing clarification and further insights from the study. Finally, the researcher has made plans to publish the results of this research in appropriate scholarly journals.

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APPENDIX A

INTERVIEW QUESTION MATRIX

Interview question	Key issue	Authors/researchers from the literature	Research question to be addressed through this interview question
P1: How long have you been a principal, and how long have you been the principal at this school?	Years of experience. Length of time leading this school. (Also, icebreaker.)	N/A	Demographic information, ***principals***.
T1: How long have you been a teacher, and how long have you been a teacher at this school?	Years of experience. Length of time working with this leader. (Also, icebreaker.)	N/A	Demographic information, ***teachers***.
P2: Describe the professional development for teachers at this school in the integration of (digital) technology into instruction.	Condition 1: Professional Development	ISTE 2000, ISTE 2008b	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T2: Describe the professional development for teachers at this school in the integration of (digital) technology into instruction.	Condition 1: Professional Development	ISTE 2000, ISTE 2008b	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P3: Describe how you communicate to the teachers here that their direct application of technology should be aligned to local and/or state curriculum standards.	Condition 2: Technology aligned to standards	ISTE 2008b	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?

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Interview question	Key issue	Authors/researchers from the literature	Research question to be addressed through this interview question
T3: Describe how your principal communicates to the teachers here that your direct application of technology should be aligned to local and/or state curriculum standards.	Condition 2: Technology aligned to standards	ISTE 2008b	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P4: How do you provide leadership in scheduling technology use – specifically, to see if technology is incorporated into the daily learning schedule, or if it is used to supplement instruction? Give examples.	Condition 3: Scheduling of technology use.	ISTE 2008b, Kulik 2003, Middleton & Murray 1999	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T4: How does your principal provide leadership in scheduling technology use – specifically, to see if technology is incorporated into the daily learning schedule, or if it is used to supplement instruction? Give examples.	Condition 3: Scheduling of technology use.	ISTE 2008b, Kulik 2003, Middleton & Murray 1999	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P5: How do you keep your teachers thoughtful of the need for classroom technology programs and applications to provide individualized feedback to students and teachers.	Condition 4: Individualization provided by technology	ISTE 2008b, Kulik 2003, White & Frederiksen 1998	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T5: How does your principal keep you thoughtful of the need for classroom technology programs and applications to provide individualized feedback to students and teachers.	Condition 4: Individualization provided by technology	ISTE 2008b, Kulik 2003, White & Frederiksen 1998	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

APPENDIX A

INTERVIEW QUESTION MATRIX

Interview question	Key issue	Authors/researchers from the literature	Research question to be addressed through this interview question
P6: Describe how you stress the ability of classroom technology programs and applications to tailor lessons to individual student needs.	Condition 4: Individualization provided by technology	ISTE 2008b, Kulik 2003, White & Frederiksen 1998	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T6: Describe how your principal stresses the ability of classroom technology programs and applications to tailor lessons to individual student needs.	Condition 4: Individualization provided by technology	ISTE 2008b, Kulik 2003, White & Frederiksen 1998	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P7: Explain how you encourage use of technology in collaborative settings, as opposed to individual settings.	Condition 5: Technology incorporated into a collaborative environment	ISTE 2008b, Kulik 2003	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T7: Explain how your principal encourages use of technology in collaborative settings, as opposed to individual settings.	Condition 5: Technology incorporated into a collaborative environment	ISTE 2008b, Kulik 2003	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P8: Describe how you lead to bring about technology use in your school that provides simulations, multimedia, and lessons based on problem-solving skills, as well as for drill-and-practice.	Condition 6: Main focus – project-based learning and real-world simulations	Adams & Hamm 2008, Cradler & Cradler 1999, ISTE 2008b	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?

APPENDIX A

INTERVIEW QUESTION MATRIX

Interview question	Key issue	Authors/researchers from the literature	Research question to be addressed through this interview question
T8: Describe how your principal leads to bring about technology use in your classroom that provides simulations, multimedia, and lessons based on problem-solving skills, as well as for drill-and-practice.	Condition 6: Main focus – project-based learning and real-world simulations	Adams & Hamm 2008, Cradler & Cradler 1999, ISTE 2008b	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P9: Explain how you demonstrate the effective use of technology for learning, communication, and project management.	Condition 7: Technology leadership, support, and modeling	Gysbers & Henderson 2002, Honey 1999, ISTE 2008b, Mann et al. 1999, Penuel et al. 2002	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?
T9: Explain how your principal demonstrates the effective use of technology for learning, communication, and project management.	Condition 7: Technology leadership, support, and modeling	Gysbers & Henderson 2002, Honey 1999, ISTE 2008b, Mann et al. 1999, Penuel et al. 2002	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?
P10: Is there anything about your role in classroom technology integration at your school that I have not asked that you would like to add?	All-encompassing question	N/A	RQ#1: How do ***principals*** in Georgia public elementary schools describe their role in effectively implementing classroom technology integration in their schools?

APPENDIX A

INTERVIEW QUESTION MATRIX

Interview question	Key issue	Authors/researchers from the literature	Research question to be addressed through this interview question
T10: Is there anything about your principal's role in classroom technology integration at your school that I have not asked that you would like to add?	All-encompassing question	N/A	RQ#2: How do ***teachers*** in Georgia public elementary schools describe the role of the principal in leading classroom technology integration in their schools?

APPENDIX B

INFORMED CONSENT (principal)

COLLEGE OF EDUCATION

DEPARTMENT OF LEADERSHIP, TECHNOLOGY, AND HUMAN DEVELOPMENT

INFORMED CONSENT

Hello. My name is Tim Sawyer, and I am a doctoral student in the Educational Administration Program at Georgia Southern University. I am conducting research for my doctoral dissertation, and I am requesting your participation in the study.

The purpose of this study is to explore the leadership behaviors exhibited by Georgia public elementary school principals that enable technology integration in the classroom.

Participation in this research will include an interview, which should last less than an hour and will be tape recorded. In addition, you may share any supporting documentation you feel comfortable sharing (e.g., files, meeting agendas, meeting minutes, presentation notes) that exemplifies or showcases your technology leadership.

There should be no greater discomforts or risks than would be present under normal circumstances in the performance of your jobs, duties, and responsibilities as educators.

While there are no direct benefits to you as a participant, a result of this study could include a clearer understanding of what constitutes effective leadership for technology integration. In addition, the benefits to society (or the school or school system) could include a greater understanding of what constitutes effective leadership for technology integration. More personnel with this understanding could increase the likelihood that quality technology integration will occur in the school.

The amount of time required from the participant should not exceed the duration of the interview, which is estimated to be anywhere from 30 to 60 minutes. A small amount of additional time might be needed if the participant chooses to comply with the researcher's request to provide him with any documents that exhibit evidence of the leader's effective technology leadership. (E.g., it might require additional time for the participant to find such documents, and perhaps a bit more time in the interview to explain their relevance to the study.)

Only the researcher and the person who will help him transcribe the interviews will have access to the information obtained in this study. The information will be maintained on a hard disk drive in the researcher's home, and on a flash drive used by the researcher for all dissertation information. (These two separate locations will be used for back-up security – e.g., in case of hard drive failure on the computer.) Information on the media used to obtain data in the interview (i.e., audio tapes and a digital audio recorder) will be erased as soon as they have been archived on the researcher's home computer and the flash drive. Data will be maintained for the required minimum of three years following completion of the study (summer of 2013), after which data on all media will be destroyed.

APPENDIX B

INFORMED CONSENT (principal)

You have the right to ask questions and have those questions answered. If you have questions about this study, please contact me or my faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, you may contact Georgia Southern University Office of Research Services and Sponsored Programs at IRB@georgiashouthern.edu or 912-478-0843.

No compensation will be provided for participation in this study. Snacks and drinks will be provided to help ensure your comfort during the interviews.

Participation in this study is purely voluntary. You are not required to participate in this research, and may end your participation at any time by telling me during the interview. In addition, you may decline to answer specific question(s), if you choose to do so. There is no penalty for deciding not to participate in the study; you may decide at any time that you don't want to participate further and may withdraw without penalty or retribution.

You must be 18 years of age or older to consent to participate in this research study. If you consent to participate in this research study and to the terms above, please sign your name and indicate the date below.

You will be given a copy of this consent form to keep for your records.

Title of Project: Principal Leadership for Technology Integration in Georgia Public Elementary Schools

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_____ _____
Participant Signature Date

I, the undersigned, verify that the above informed consent procedure has been followed.

_____ _____
Investigator Signature Date

APPENDIX B

INFORMED CONSENT (teacher)

COLLEGE OF EDUCATION

DEPARTMENT OF LEADERSHIP, TECHNOLOGY, AND HUMAN DEVELOPMENT

INFORMED CONSENT

Hello. My name is Tim Sawyer, and I am a doctoral student in the Educational Administration Program at Georgia Southern University. I am conducting research for my doctoral dissertation, and I am requesting your participation in the study.

The purpose of this study is to explore the leadership behaviors exhibited by Georgia public elementary school principals that enable technology integration in the classroom.

Participation in this research will include an interview, which should last less than an hour and will be tape recorded. In addition, you may share any supporting documentation you feel comfortable sharing (e.g., files, meeting agendas, meeting minutes, presentation notes) that exemplifies or showcases technology leadership by your school's principal.

There should be no greater discomforts or risks than would be present under normal circumstances in the performance of your jobs, duties, and responsibilities as educators.

While there are no direct benefits to you as a participant, a result of this study could include a clearer understanding of what constitutes effective leadership for technology integration. In addition, the benefits to society (or the school or school system) could include a greater understanding of what constitutes effective leadership for technology integration. More personnel with this understanding could increase the likelihood that quality technology integration will occur in the school.

The amount of time required from the participant should not exceed the duration of the interview, which is estimated to be anywhere from 30 to 60 minutes. A small amount of additional time might be needed if the participant chooses to comply with the researcher's request to provide him with any documents that exhibit evidence of the leader's effective technology leadership. (E.g., it might require additional time for the participant to find such documents, and perhaps a bit more time in the interview to explain their relevance to the study.)

Only the researcher and the person who will help him transcribe the interviews will have access to the information obtained in this study. The information will be maintained on a hard disk drive in the researcher's home, and on a flash drive used by the researcher for all dissertation information. (These two separate locations will be used for back-up security – e.g., in case of hard drive failure on the computer.) Information on the media used to obtain data in the interview (i.e., audio tapes and a digital audio recorder) will be erased as soon as they have been archived on the researcher's home computer and the flash drive. Data will be maintained for the required minimum of three years following completion of the study (summer of 2013), after which data on all media will be destroyed.

APPENDIX B

INFORMED CONSENT (teacher)

You have the right to ask questions and have those questions answered. If you have questions about this study, please contact me or my faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, you may contact Georgia Southern University Office of Research Services and Sponsored Programs at IRB@georgiashouthern.edu or 912-478-0843.

No compensation will be provided for participation in this study. Snacks and drinks will be provided to help ensure your comfort during the interviews.

Participation in this study is purely voluntary. You are not required to participate in this research, and may end your participation at any time by telling me during the interview. In addition, you may decline to answer specific question(s), if you choose to do so. There is no penalty for deciding not to participate in the study; you may decide at any time that you don't want to participate further and may withdraw without penalty or retribution.

You must be 18 years of age or older to consent to participate in this research study. If you consent to participate in this research study and to the terms above, please sign your name and indicate the date below.

You will be given a copy of this consent form to keep for your records.

Title of Project: Principal Leadership for Technology Integration in Georgia Public Elementary Schools

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_____ _____
Participant Signature Date

I, the undersigned, verify that the above informed consent procedure has been followed.

_____ _____
Investigator Signature Date