

AN ANALYSIS OF PRINCIPALS' PERCEPTIONS OF TECHNOLOGY'S
INFLUENCE IN TODAY'S SCHOOLS

A Doctoral Thesis Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education
in Professional Leadership

by

Robert L. Bell

May, 2011

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ABSTRACT

In this era of accountability created by federally mandated initiatives, school leaders are still searching for ways to improve schools. Principals must learn to manage schools efficiently while moving classrooms out of the industrial age school model and into a 21st century, technology rich learning environment that enhances student achievement. The purpose of this study was to understand the importance of technology in today's schools and its impact on principals, counselors, teachers, and students.

The study used archival data from a larger survey and focused on understanding principal perceptions of how technology influences their daily roles as school leaders. The 310 principals originally interviewed were from the larger Gulf Coast metropolitan area and were actively serving as the principal of a school at the time they were surveyed. A combination of traditional survey and cognitive interviewing techniques were used to address the questions related to principals' perceptions regarding the influence of technology on their campuses. Principals were asked to describe the extent technology had made a difference at their school; how it had influenced teachers, counselors, and students; as well as how it had influenced their role as a principal?

Four major themes emerged and were identified and given an operational definition of Positive Influence, Moderate Influence, No Influence, and Negative Influence to describe the impact technology had on the different principal's campuses.

The results of the analysis indicated that 62.3% of the principals self-reported that technology had made a positive impact on their roles as principals; in their schools; as well as making a positive impact on teachers, counselors, and students. Of the 35.7% of principals who believed technology had been a negative impact on their campuses, over half of them reported that technology had a negative influence on their role as a principal. If technology is to play a role in developing a project-based, real-world, problem-solving curriculum that equates to student engagement and student achievement in the classroom; these findings indicate that the principal's perception of technology's influence plays a key role in that integration occurring at the campus level.

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Chapter 1: Introduction

Since the release of *A Nation At Risk: The Imperative for Educational Reform* in 1983, Americans have been clamoring for improved public schools in the United States. That report from American President Ronald Reagan's National Commission on Excellence in Education cited various surveys that American students were performing poorly when compared to other industrialized nations' students. It led to the sense that American schools were failing to educate our students and prompted a wave of local, state, and federal reforms (Bozeman & Spuck, 1991; Bracey, 2008). Much of that blame was placed directly on school administrators and teachers. Over twenty-five years later, school districts are still struggling with those reforms and how best to prepare our students to be competitive in the current global economy. There have been abundant reports citing declining national test scores, discipline problems, substance abuse, and increasing drop-out rates in our public schools (Bozeman & Spuck, 1991). In addition, today's principals are dealing with a myriad of issues that include increasing class sizes, fiscal responsibility, standardized testing, and unfunded mandates (St. Jean, 2008), not to mention the increased polarization of education and the increasingly polar views that exist within—and across—constituent groups.

With the implementation of the federal 2001 No Child Left Behind Act (NCLB), local communities have lost control of their schools and are now accountable to the state and federal governments for student achievement (Hursh, 2005). This law has changed the way schools educate children by holding individual campuses accountable for the achievement of all students by raising standards and implementing standardized tests. If

campuses fail to make adequate yearly progress (AYP) toward those goals set out in NCLB, they can incur penalties, or even be closed (Hursh, 2005).

Principals in the 21st century school context are under pressure and searching for ways to enhance student achievement and monitor student progress. One possible tool might be the effective use of technology for enhancing instruction, communication, and for managing databases of performance data that can inform practice. Hines, Edmonson, and Moore (2008) state that in today's school environment, principals have access to large amounts of data which they must manage accordingly in order to be successful. Learning to utilize this technology in an advantageous way could revolutionize a principal's ability to manage student records and information processing (Witten & Richardson, 1991). For example, student data can be stored and sorted in an Excel spreadsheet for teachers and administrators to see student strengths and weaknesses (Haughey, 2006). This is incredibly advantageous for student achievement because students' academic weaknesses can be identified from collated information, and a remediation plan can be put into place quickly.

Statement of the Problem

In this era of accountability created by federally mandated initiatives, school leaders are still searching for ways to improve schools. Principals must learn to manage schools efficiently while moving classrooms out of the industrial age school model and into a 21st century, technology rich learning environment (Lehmann, 2009; Soule, 2008). The school principal is tasked with creating an environment in which all students are engaged and successful in their learning. Garland (2009) reports that one way to

transform learning while bringing schools into the 21st century is through the use of technology. This could include all types of databases and spreadsheets used administratively to track student progression on state-mandated objectives and student attendance; electronic communications; or even new technologies used inside the classroom to help engage student learners in their curriculums.

Within the last decade, the world has witnessed a multitude of technological advances intended to make peoples' lives easier and better. High-speed Internet, Wikipedia, Google, iPod and iPad, USB Flash Drive, BluRay DVD player, High-definition television, and the smart phone are a few examples of this technology and some of the most popular of the advances that have revolutionized the way we live our daily lives. But what impact has this had on the educational setting? Are these technological advances finding their way into the classroom? And if so, are they creating a positive impact on student learning?

There has been a plethora of educational leaders purporting the value of technology in education for many years (Bennett & Gelerter, 2001; Dawson & Rakes, 2003; Trotter, 1997); but it has yet to make the impact needed to substantially raise student achievement. Afshari, Bakar, Luan, Samah, and Fooi (2008) report that school administrators must incorporate technology into their daily routines and model its usefulness. When looking for innovative ways to engage students in the 21st century, Childress (2004) noted that educational leaders should consider the philosophical contributions to education of John Dewey. Dewey supported bringing real world problems into the classrooms so that a student's learning was more personalized. He

advocated for more kinesthetic type activities that give students a chance to show what they have learned. Technology may provide this opportunity.

Unfortunately, almost 70 years after Dewey (1938) published his work, *Experience in Education*, many teachers are still struggling with how they can incorporate technology and hands-on activities more frequently in their classrooms. All too often, teachers employ the technique of sage-on-the-stage and deliver instruction through lectures from the front of the classroom while handing out countless drill and practice worksheets. They are failing to capitalize on Dewey's suggestions by incorporating teenagers' fascinations with technology and bringing that enthusiasm into their classrooms. According to Eastmond, Bentley, and Johari (2005), Dewey would say that "education becomes relevant, when it connects with the experience of life" (p.107). Therefore, in order for our students to really learn the curriculum, teachers would need to find a way to help students experience those curricula in a personal way.

For example, instead of requiring students to memorize facts and figures from the questions we pose, couldn't we use their curiosity and technology to our advantage by encouraging them to perform Internet searches to acquire new information and ideas? Dewey envisioned a classroom in which students would assume more ownership of their learning and share power with the teacher. It would be a classroom in which students are involved in their education and bring outside experiences into the classroom. Dewey would say that, "Education is not just the preparation for life but, rather, education is life" (Thomas, 2005, p.440).

Technology can be an active tool in bringing Dewey's educational visions to fruition in today's classrooms. For example, a phenomenological study is as an example of a classroom that Dewey would support as the optimal learning environment for students. In a qualitative study Kim, Grabowski, and Song (2003) investigated the perception of science teachers who used a Web-enhanced problem-based learning (PBL) model. Their research purpose was "to determine if pedagogical beliefs and teaching approaches are linked to teachers comfort with using web-enhanced PBL" (2003, p.3). Another goal of the study was to determine if teachers' experience in web-enhanced PBL led them to change their instructional strategies in the classroom.

The data reported by Kim et al. showed that teachers were able to incorporate the newly-learned strategies with ones they already possessed in order to successfully implement web-enhanced PBL (2003). Kim et al. concluded with the findings that implementing a new program in the teachers' classroom provided them with the opportunity to reflect on their practices while embracing new, innovative strategies that motivate and enhance student learning.

In review, a classroom in which a teacher has approximately 25 - 35 students is expected to deliver the state-approved curriculum while keeping students engaged in that day's lesson. Recalling Dewey's philosophy of education, a teacher should incorporate a student's life experiences into her lessons while engaging them with a project-based, real-world, problem-solving curriculum using technology. What influences does the school's principal have on this process? While evidence of this relationship has been established through previously mentioned studies, no such relationship has been investigated within

the schools in a large, metropolitan area. Currently, not enough is known about the impact of principals' perceptions of technology's influence in the gulf coast area schools and students.

Need for the Study

Can technology play a role in developing a project-based, real-world, problem-solving curriculum? Does technology equate to student engagement and student achievement in the classroom? It did in the classroom reported earlier when the teachers used the Kids as Airborne Mission Scientists (KaAMS) web-enhanced PBL program. However, the principal is the key component when introducing technology into the curriculum (Dawson & Rakes, 2003).

Significance of the Study

The goal of this study is to understand the importance of technology in 21st century schools and the impact it has had on principals, counselors, teachers, and students. This study will focus on understanding the principals' perceptions of technology and how it has influenced their daily roles as school leaders. The results of this study will expand the knowledge base regarding the value and use of technology in education as perceived by school principals. The data gathered is extremely timely in light of the accountability of school principals and making sure all students are successful in their mastery of the state's curriculum. Technology can play an integral part of that objective.

For this study, 310 principals from a large, Gulf Coast metropolitan area were interviewed. A combination of traditional survey and cognitive interviewing techniques were used to address the questions related to principals' perceptions regarding the influence of technology on their campuses. Background information of the principals and demographic information about their respective schools were obtained in a standard survey format. This information allows for the examination of likenesses and differences across schools based on grade level, demographics, and location. This format allows the examinee to provide more fully developed responses. Principals' perspectives can be shaped by the reality of their own school environment. In addition, principals' perceptions are also influenced by their own belief systems and experience. For this reason, the research will also consider the responses by gender and experience level of the examinee. In addition to the demographic information collected, the exploratory nature of the use of technology section lent itself to open-ended questions. The open-ended response format allowed for elaboration by the respondent in answering the question. Since the principal's leadership influence can set the tone for campuses' technology integration into the curriculum, it was critical to obtain the perceptions of the instructional leader regarding its use.

Research Questions

With the goal of more fully understanding the role the principal plays in effective campus technology integration, this study will focus on the eight questions listed below:

1. How has technology influenced the role of a principal?

2. What is the principal's perception of the extent technology has made a difference in the school?
3. What is the principal's perception of how technology has influenced teachers, counselors, and students?
4. Do principals with varying number of years of experience as a principal differ with regard to their self-reported perceptions of technology's influence?
5. Will the principals' perceptions of technology vary dependent on the gender of the principals?
6. Do principals from schools with different Texas Education Agency accountability ratings differ with regard to their self-reported perceptions of technology's influence?
7. Do principals from school districts from various geographical settings (i.e., rural, urban, etc.) differ with regard to their self-reported perceptions of technology's influence?
8. Do principals from schools representing various grade levels (i.e., elementary, middle, etc.) differ with regard to their self-reported perception of technology's influence?

Chapter 2: Review of the Literature

The goal of this study is to understand the importance of technology in 21st century schools and the impact it has had on principals, counselors, teachers, and students. This study will focus on understanding the principals' perceptions toward technology and how it has influenced their daily roles as school leaders. The review of literature that follows is divided into the following sections: how technology can impact classroom instruction; incorporating emerging web technologies into courses; how leadership affects technology; how technology has impacted the principal's role; how electronic communication has affected the role of the principal; how the principal's technology training influences technology integration on campuses; and finally, the principal's role in technology integration.

In the 1990's, two major movements occurred in public education that began to shift policy involving how we educate students: "intense criticism of schools and the proliferation of computer technology" (Brockmeier, Sermon, & Hope, 2005, p.45). Many public school officials decided that technology was the way to help raise student scores and become more competitive on the global stage. For that reason, technology will be the focus of this study. If American students were to regain their competitive edge internationally, could technology play an important role in that transformation? A major advantage American students have on their international counterparts is facilities and resources. The student-to-computer ratio in the United States has steadily decreased over the past 20 years. It has decreased from 13.7 students per computer in 1992 to six computers per student in 1998 (Brockmeier, Sermon, & Hope, 2005).

As this era of accountability applies pressure on schools to raise student performance on standardized tests, school leaders are still searching for ways to facilitate improvement. The school principal is tasked with creating an environment where all students are engaged and successful in their learning. Garland (2009) states that one way to transform learning while bringing schools into this era of accountability is through the use of technology.

Most of today's youth live in a world surrounded by technology and have more of a grasp of living in the 21st century than most of the teachers do. Students are busy using various technologies in their homes "to communicate (instant messaging), sharing (blogs), buying and selling (eBay), exchanging (peer-to-peer technology), creating (Flash), meeting (3D worlds), collecting (downloads), coordinating (wikis), evaluating (reputation systems), searching (Google), analyzing (SETI), reporting (camera phones), programming (modding), socializing (chat rooms), and even learning (Web surfing)" (Prensky, 2005, p. 10). Schools must give students a chance to bring that technology into their curricula. Students get excited when technology is used in the classroom, and their excitement results in a greater comprehension of the curriculum (Boon, Fore III, and Spencer, 2007). Technology provides students with the opportunity to become more involved with their learning, allowing them to interact with the content (Nelson, Christopher, and Mims, 2009).

The Principal's Role in Technology Integration

Can technology play a role in developing a project-based, real-world, problem-solving curriculum for students in public schools? If so, the principal is the key

component when introducing technology into the curriculum (Dawson & Rakes, 2003). In order for this infusion of technology to occur, Byrom & Bingham say that the principal should provide that technology leadership on his campus and demonstrate its usefulness by using technology in his daily practice (2001). If a principal exhibits enthusiasm for technology uses on the campus, then teachers are more likely to follow their lead (Hope, 1997; Tooms, Acomb, & McGlothlin, 2004).

In 2005, Brockmeier, Sermon, and Hope released the results of their study in which they investigated the role the principal plays in technology integration. They hoped to determine the principals' current level of computer expertise and if the principals were prepared to lead their campuses in the integration of computer technology into the teaching and learning process. In addition, they sought to determine if the principals were prepared to use computer technology to accomplish administrative and managerial tasks.

Brockmeier et al. mailed 501 questionnaires to elementary, middle level, and high school principals selected from the Florida Education Directory. After two mailings, 268 principals returned the surveys and were used in the study. Of the principals, 58.05% were male and 41.95% were female. The majority (73.96%) of the respondents were Caucasian, with 19.62% being African-American, and 6.42% being Hispanic. The majority of respondents (39%) had 4-10 years of experience. The largest response to the survey came from elementary principals (60.30%), and over 46% of the respondents worked in suburban schools. Most (over 73%) labeled themselves as novice or intermediate in computer technology expertise.

The Computer Technology Survey (CTS) was the instrument used to obtain the information from the principals in this study. The researchers were investigating the level of expertise of the principals in assisting teachers with technology integration on their campuses as well as determining how much the principals used computer technology for managerial and administrative functions. The CST was a questionnaire that asked 40 questions, and responses were recorded using a five-point Likert scale.

While the majority of principals (66%) responded in the survey that they agree or strongly agree that they spend a great deal of their time assisting teachers with technology integration into their classes, only 55% reported that they agree or strongly agree to providing teachers with opportunities during the school day to evaluate software effectiveness. 76% of the principals participating in the survey reported that they agree or strongly agree that one of their important instructional tasks is facilitating curriculum integration of computer technology. Yet almost one out of five principals reported that they were either undecided, disagree, or strongly disagree that they should provide time during the work day for teachers to become familiar with the capabilities of technology devices.

More than 80% of the principals reported that they could benefit from more professional development in assessing computer technology's influence on student achievement: using computer technology to collect and analyze data; integrating computer technology into the curriculum; using computer technology to facilitate change; and using computer technology in their work as principal. However, just fewer than 69% of the respondents reported a need for professional development in understanding ethical

issues related to computer technology, in understanding legal issues related to software licensing, and in learning how to protect students from inappropriate materials on the Internet.

Brockmeier et al. concluded from their research that while many principals reported understanding the benefits of integrating technology into the curriculum, a substantial majority cited the need for more professional development to aid that process. Of the CST respondents, only 59% believed that they were the technology leaders in their respective schools based on their level of technology expertise. Despite those results, almost 50% of the principals were unwilling to give teachers the decision making power regarding technology. The authors also found that while a majority of the principals were comfortable using technology to communicate electronically, many cited a need for professional development regarding the use of technology for research, developing budgets, creating databases, and preparing presentations.

How Leadership Affects Technology

In 2008, Afshari, Bakar, Luan, Samah, and Fooi published their study involving 30 Iranian secondary school principals from the 19th educational area in Tehran that investigated the principals perceived level of computer use, computer competence, and leadership style (transformational and transactional). The group wanted to determine how leadership affects the use of technology in schools. For the study, 30 Iranian principals volunteered to complete the three-part survey tool which incorporated two Likert scale sections and one Multifactor Leadership Questionnaire.

The demographics of the group showed that 53% was female and 47% were males. The majority (43%) of the group's age fell within the 42-47 range, while 30% was between the ages of 48-53; 16% was 41 or younger, and 11% was 60 or older. When analyzing the groups' years of experience, Afshari et al. determined that 40% had less than 19 years of experience; 40% was between 20 and 25 years; and 20% had 26 or more years of experience. Of the group, 60% worked in private schools while the remaining 40% worked in public schools.

When analyzing the first section of the survey dealing with the principals' use of the computer, Afshari et al. measured four areas using a five-point Likert scale: Internet use, hardware and software use, instructional use, and administrative use. 20% of the principals reported that they use their computers to access the Internet daily, while 43% used it 2 or 3 times a week. A little more than 16% of the respondents reported using the Internet a few times a month. The majority of the principals, who accessed the Internet daily, did so in order to receive and send electronic communication. In the category of instructional use, 40% reported using their computer two or three times a week for recording discipline referrals, monitoring student achievement, grades, creating master schedules, and developing or writing curriculum. The category of computer use (administrative use) showed that principals spent less time using their computers for this domain than the other three. About 50% reported that they never used the computer for emerging professional development opportunities like collaborative work groups and online study groups.

The second section of the survey used a four-point Likert scale to give the participating principals an opportunity to rate themselves on eight domains of their perceived competency using technology. The domains measured included basic computer operation skills; set up, maintenance, and troubleshooting of equipment; word processing; spreadsheets; database; networking; telecommunication; and media communication. A majority of the principals self-reported that they had the most competence in basic computer operation skills and word processing while 40% of the principals reported that they had little competence in spreadsheets and databases.

The final area measured by the survey used a five-point Likert scale to determine the leadership style of the participating principals. The authors believe that transformational leaders were more likely to motivate their staffs and successfully implement technology in their schools in order to raise student achievement. A Multifactor Leadership Questionnaire was used to find out if the principals believed they were transformational or transactional leaders. The principals answered 12 questions to measure their transactional leadership rating and 20 questions to measure their transformational leadership rating. Overall, more than 73% of the respondents reported using the transformational leadership style fairly often or frequently if not always. Over 60% of the principals reported using a transactional approach to leadership sometimes.

In conclusion, Afshari et al. found that the principals participating in this study reported using computers two or three times a week for a range of instructional and administrative tasks. They continued by saying that in order for the principals' staff to

embrace the role technology can play in enhancing student achievement, the principals themselves must first model those uses to ensure effective implementation.

Technology's Impact on Principals

In 2006, Margaret Haughey published her qualitative research in which she studied two urban school districts in western Canada by interviewing principals about their computing practices as related to their work. She interviewed 19 principals from elementary and junior high schools that had combined enrollments of approximately 800,000 students. Senior district administrators identified the principals for the study, and principals who used technology frequently in their roles were chosen along with principals who rarely used technology. Haughey recorded, transcribed, and reviewed the interviews by first using content analysis for initial delineation of categories and then using line-by-line analysis.

Haughey's research provided her with the opportunity to answer questions involving the use of technology by school leaders. She sought to determine how the computer had influenced and shaped the principal's daily work as well as how it has assisted in distributed leadership. Finally, she wanted to determine if knowledge management is becoming ubiquitous, how is it influencing administrators' work?

Today, the role of a principal is generally accepted to be one that requires many different hats. One in which the administrator deals with a myriad of problems and issues and is involved in communicating with a very diverse group of people. In the study, principals reported that technology had enhanced their schools' communication efforts through phone calls, emails, web sites, and newsletters. Principals said more

information was being delivered to parents and in response to that; more parents were taking the initiative to contact the campus.

Principals also reported the convenience of having a Student Information System which allowed them to speak with parents about academic concerns they had of their students. A big advantage of such a system is the principal's ability to answer parental concerns more quickly, instead of putting callers on hold while they track down the information. However, principals also reported that they feared becoming too impersonal and spending too much time behind their computer instead of being in classrooms around the campus.

When considering distributed leadership, Haughey found that many principals in the study used email technology to build consensus among their staffs at a much quicker pace. They reported that they were able to email questions to staff and get their input much faster than by calling each one individually. Principals reported that they could email teachers questions about students and generate solutions in a more timely fashion. The email was a much better solution than using the phone and interrupting classes. In addition, principals reported that they were able to access more of their peers outside of their campus to gain insight into current issues and problems. The computer had helped campus personnel collaborate more effectively and efficiently.

Technology has also played an important role in changing professionalism within the school's structure. As principals are expected to increase standardized tests scores for their campus, technology has equipped them with yet another resource to disseminate data. Teachers are now given their students' test results and can quickly ascertain each

student's strengths and weaknesses from an Excel spreadsheet. In turn, they are able to chart the course for the upcoming year and where they should spend the majority of their instructional time. Technology had equipped principals with information in a more efficient manner, and less time was spent with the busywork of calculating and recording data with ledgers and calculators.

Finally, Haughey described how principals in the study reported the advantages offered by technology with respect to knowledge management. Software programs helped them with everything from budgeting to student discipline. Users were able to compare and contrast different year's data and plan accordingly. Principals spoke about how they had programs to analyze staffing components, parents who came for parent/teacher interviews, as well as being networked with everyone in the entire district.

Haughey concluded that the networked computer has proven beneficial in helping schools cope with the greater demands being placed upon them by today's society. Technology has helped principals create new ways of learning in their schools as well as bringing teachers into leadership roles through distributed leadership. Haughey concludes by saying that technology has the ability to be a transformative force in our schools at a time when additional burdens and higher expectations are on every principal's desk.

The Influence of Principals' Technology Training

In 2003, Dawson and Rakes published a study where they examined the influence of principals' technology training on the integration of technology into classrooms. The pair surveyed K-12 public and private school principals from the United States by placing

the survey's URL on listservs for the National Association of Secondary School Principals, the National Association of Elementary School Principals, and state departments of education. In addition, a portion of the survey participants were chosen from the Web66 International School Registry. The survey was a combination of demographic questions and the School Technology and Readiness (STaR) Assessment instrument. The composite score from this questionnaire was used to measure five components of the schools' integration of technology: connectivity, hardware, context, professional development, and integration and use. 398 principals (56.4% elementary, 19.4% junior high/middle, and 24.1% high school) participated in the study.

From the respondents' surveys, Dawson and Rakes looked to answer several questions involving data obtained from the School Technology and Readiness Assessment (STaR) instrument. The pair studied the type, time, and levels of technology training the principals received to determine if there was an effect on technology integration on their campuses. In addition, they sought to determine if the principals' demographic differences and the school's demographic differences contributed to the different levels of technology integration at the various schools.

Dawson and Rakes categorized the technology training the principals received in the twelve months prior to their study into four groups; Type I - basic technology tools and applications; Type II - basic technology tools and applications with Internet fundamentals; Type III – integrating technology into the curriculum; and Type IV – training customized to the needs of the principal. From the study, they determined that 68% of the principals reported receiving Type III and IV technology training.

Unfortunately, that left almost a third of the principals surveyed not receiving the training they would need to ensure technology was being integrated into the curricula on their campuses. The study also showed that the principals' ages were more of a factor for technology integration than was their years of administrative experience or sex. Principals who were between the ages of 41 to 55 were found to influence technology integration much more on their campuses than other age groups.

Additionally, Dawson and Rakes found that the demographic variables such as school level and school size did not influence the integration of technology on campuses. However, a significant influence was found on campuses on which the principals had received technology training in the previous 12 months. Furthermore, the number of training hours the principals received also influenced how much technology integration occurred on their campuses. Significantly less integration transpired on campuses where the principals received less than 13 hours of training as compared to 13 to 25 hours.

Finally, the study also demonstrated that the type of technology training a principal receives produces a significant statistical influence of technology integration into the curricula. There were four types of technology training categorized by Dawson and Rakes: basic technology tools and applications, basic technology tools and applications with Internet fundamentals, integrating technology into the curriculum, and training customized to the needs of the principal. In schools in which their principals had participated in the last two categories of technology training, technology integration into the curriculum was significantly greater. Interestingly enough, the authors were surprised to find that there wasn't a significant difference in technology integration between

principals who had received the two higher forms of technology training. Dawson and Rakes reported that they believed they would find more technology integration on those campuses in which a principal had received training that was customized to his needs than on campuses where a principal had received training to integrate technology into the campus' curriculum. The concluding evidence from this study demonstrates that technology is more likely to be integrated into the school's curriculum when a principal's technology training is sustained and encompasses the needs of the principal.

The Impact of Electronic Communication on School Leaders

In 2008, Hines, Edmonson, and Moore published the results of their qualitative study in which they looked at the impact of electronic communication on the role of the school principal as well as any unanticipated consequences that resulted from the use of electronic communications. For this phenomenological study, 10 principals in Texas were selected and interviewed at their job sites. The demographic data of the principals included: ages ranging from 40 to 59 years, experience levels ranging from 2 to 20 years, district sizes ranged from 7,000 to 50,000 students, and grades ranging from PK through 12. One-hour interviews were conducted with each principal and then transcribed verbatim. Afterwards, the scripts were read and analyzed for major constructs and common themes.

When studying the data, Hines et al. found two main categories: principal role themes and computer-mediated communication themes. The first category (principal role themes) was based on work actually performed by the principals, while the second category (computer-mediated communication themes) involved the principal's electronic

communication. Interestingly enough, each theme brought with it a set of positive and negative attributes.

When reviewing the first category of themes, Hines et al. found six common themes reported by all of the principals relating to their roles and work as principals: volume of information, time at the computer, time at work, accessibility, training for aspiring principals, and training for staff. Simply stated, principals today are inundated with electronic communication from all sources. In the past, secretaries sorted through a principal's mail and prioritized in order of importance. Today, electronic communication travels directly to the principal, relevant or not. This has caused an increase in the amount of time needed at the computer. Many principals in the study reported the need to schedule time at their computers in order to correspond with all of the emails they are sent; often times that includes longer days or taking work home. The final two themes in this category included training for aspiring principals and campus personnel on appropriate procedures for email correspondence.

When processing the second category of themes, Hines et al. found six common themes reported by all of the principals relating to the unanticipated consequences of electronic communication: staff interaction, style and syntax, immediate and impulsive properties, the absence of social presence, rate of speed of communication, and complications related to open records, legal issues, and student privacy. Several principals spoke about how staff communication had improved and that teachers were now able to expand their network of peers because of electronic communication. Many of the principals referred to the style and syntax of electronic communication has

produced. One principal compared it to a cross between a formal memo and an informal telephone call. Another common theme found in the interviews was that the rate of speed of the communication can sometimes lead to immediate and impulsive communication. One principal reported that this has led to stress and anxiety because parents and staff expect immediate responses to their communication efforts.

Each of the principals in the study admitted in their interviews that they now communicate differently as a result of electronic communication. They are processing more information and communicating with staff, students, and parents more than ever before. Often, the community's need for an instantaneous response is causing stress and anxiety in principals if they are not able to manage it accordingly. In conclusion, Hines et al. recommended that principals should train their staff about the benefits and complications associated with electronic communication. They also recommended that principals should set schedules that include time to work at the computer handling correspondence. And finally, principal preparation programs should help aspiring principals develop time management strategies that specifically deal with the demands of tomorrow's electronic communication needs.

Incorporating Emerging Web Technologies into the Classroom

In North Carolina, schools are using cell phones to address low math and science scores by sending math problems to students via their mobile devices (Ramaswami, 2008). If students do not submit the correct answers, there are remediation activities that help them reach the learning target. Carnevale (2007) reports that students can use their cell phone computer programs like flash cards that quiz them on a variety of subjects. He

also says that telephones could be used for providing images with audio commentary covering a variety of topics. Obringer and Coffey (2007) state that cell phones with cameras can be used to record field trips and student events. Young (2008) asserts that a university professor uses his iPhone to post Twitter messages after every class. The professor says that it is a great way to get quick feedback about how the day's lesson went. Galuszka (2005) maintains that teachers can use cell phones to broadcast lectures and course-related music anywhere, allowing students to access the information at any time. In addition, various software developers have introduced SAT study aids that allow users to access flashcards, drills, and practice tests (Lum, 2005).

In an action research qualitative study, Saeed, Yang, and Sinnappan (2009) investigated student learning styles and technology preferences in order to determine the most appropriate way to incorporate emerging web technologies into college courses. In their report, the authors hypothesized that student learning styles and technology preferences have a great effect on their academic performances. In order to determine this, Saeed et al. used the action research method by collecting data through student surveys to determine their preferred learning style and web technology preferences; incorporated those findings into a web programming course; then analyzed the students' academic performance in that course. The authors' goals were to provide a guideline for educators when using web technologies in their courses.

The various web technologies studied by the authors included blogs, wikis, instant messaging (IM), social bookmarking, podcasting, and vodcasting. Blogs are considered to be any website that includes regular commentary entries, description of events, and can

include graphics and video. Wikis are defined as a collection of web pages by various authors linked to each other. Instant messaging (IM) would be real-time conversations via the Internet between two or more individuals. Social bookmarking is used collaboratively to store and organize Internet bookmarks. Finally, Saeed et al. described podcast and vodcast as a method of distributing audio and video files collaboratively on the Internet (2009). All of these emerging web technologies were believed to “potentially create engaging learning environments” (Saeed et al., 2009, p. 99).

The second part of this study looked to link different learning styles to the instructional strategies in order to increase student achievement. A cognitive learning theory approach was used to highlight the individual differences in learning. The authors used the Fedler learning model and incorporated the Fedler and Soloman questionnaire that measures four learning style dimensions: active-reflective, sensing-intuitive, visual-verbal, and sequential-global. Saeed et al. used an action research method to carry out the study and identified four phases: to collect students’ learning styles and technology preferences for emerging web technologies; to experiment a combination of emerging web technologies based on students’ learning styles and technology preferences; to analyze the impact of above experiments on students’ academic performances; and to identify key achievements and shortcomings of the study and redefine their research objectives (2009). Saeed et al. defined learning styles as a “signed indicator that shows how students perceive, interact, and respond to learning environments” (2009, p. 99).

The participants were 204 students working toward completion of their Bachelors or Masters of IT degrees during 2007 in a web programming course. The learning style

data was collected through an online survey using Fedler-Soloman's learning style inventory. The technologies preference data was collected via a questionnaire designed by the authors. It used a 5-point Likert scale that asked participants to rate their technology preferences against various academic activities. 119 participants responded to the learning styles survey, while 105 students responded to the technology preferences survey.

Saeed et al. decided to incorporate a course blog, course bookmarks page, and lecture podcast/vodcast recordings of lectures in their study (2009). The goal of the course blog was to get quick feedback and to enhance student collaboration. The course bookmarks page was intended to build online resources for class members with easy access. Students could access podcasts and vodcasts of lectures in three ways: live streaming, manual download, and automatic subscription.

At the end of the semester, the authors analyzed all of the students' assessments to determine if age and/or gender had any bearing on the students' academic success. Through the use of a Chi square analysis, no relationship was found between gender and student success. The authors did not find any significant correlation between the four learning styles and high achievers or low achievers.

Based on the data provided through the two surveys, the authors determined that podcast, vodcast, email, and blog worked best for sequential, visual, sensing, and intuitive learners. While the authors found that the verbal learning style was the most frequent single learning style that emerged from their study, the dual learning style emerged as the dominant style. The results also led the authors to report that students

preferred to use both synchronous and asynchronous communication tools. In addition, they found that students are ready to experience new technologies and are willing to use multiple methods of communication.

Saeed et al. also found a correlation between sensing learners preferring email more than intuitive learners who preferred communicating through IM, blog, or wikis (2009). Intuitive learners were defined as those students who preferred new methods of communicating. The connection between visual learners and vodcasting was not surprising. Sequential learners were more successful with the podcast lectures because they were able to review the material at their own pace.

In conclusion, the study revealed that today's learners are able to accommodate their learning styles with the various emerging technologies available to them. The results also suggested that today's students are flexible enough to use multiple technology tools instead of just one. The authors' hypothesis was supported by the data from their research. They found that student learning styles and technology preferences have a great effect on their academic performance.

Technologies Influence on Teachers' Instruction

In 2003, Kim, Grabowski, and Song published the results of their qualitative study in which they investigated the perception of science teachers who used a web-enhanced problem-based learning (PBL) model "to determine if pedagogical beliefs and teaching approaches are linked to teachers' comfort with using web-enhanced PBL" (2003, p.3). Another goal of the study was to determine if teachers' experiences in web-enhanced PBL led them to change their instructional strategies in the classroom. The

authors used a phenomenology research methodology which attempted to “describe and interpret the perspectives, beliefs, and practice of teachers using web-enhanced PBL” (2003, p.3).

The teachers included in the study were selected from a pool of teachers in a Northwestern Pennsylvania school district. The teachers used the Kids as Airborne Mission Scientists (KaAMS) web-enhanced PBL program. The program was developed to get students interested in science as they participated as NASA scientists who explore environmental issues. The PBL learning process for the students included problem scenario, search information, collect/analyze data, and propose solutions. Kim et al. collected data through classroom observations and in-depth interviews (2003). The five participating teachers were interviewed twice at the end of the semester. The first interview was a series of scripted questions, while the second interview allowed the teachers to elaborate more on their responses from the first interview.

The researchers used the phenomenological research approach and looked for teachers’ perceptions of the web-enhanced PBL. The data obtained from the classroom observations and interviews were then examined in search of common themes. Afterward, the authors developed individual structural descriptions by using information gathered during the interview process.

The results from the classroom observations proved to be interesting and familiar. In the beginning, the teachers were slow to adopt the new practices they had learned to execute the web-enhanced PBL. The simple reason for that was the teachers were unfamiliar with the new strategies needed to create a successful classroom environment

for the project to succeed. However, all teachers adapted quickly and began implementing the new strategies with success.

The results from the in-depth interviews yielded interesting responses from the teachers' perspectives. The teachers' pedagogical beliefs closely coincided with those of the web-enhanced PBL methods. The teachers reported that the program allowed them to teach as they wanted to, using methods that promoted authentic problem solving, collaborative learning, in conjunction with promoting student thinking. While most of the teachers were comfortable in their new roles of facilitating the learning, some expressed concern over the amount of preparation time required for lessons and activities. One respondent reported that she was not comfortable in the role of facilitator/coach.

During their interviews, the teachers spoke about what role the Internet played in the study. Most teachers believed that the use of the Internet in this program motivated the students to get their work done. The teachers felt the students were more actively engaged in their learning, specifically in the problem solving process. The other side of that coin was the teachers' lack of confidence in their own abilities to use the Internet and its resources for instruction. Finally, the teachers were in agreement that the amount of communication used by all students increased in order to work collaboratively toward the completion of the learning targets within their groups.

The data reported by Kim et al. showed that teachers were able to incorporate the newly-learned strategies with ones they already possessed in order to successfully implement web-enhanced PBL (2003). However, the results of this study implied that the teachers' success in integrating the new strategies depended on how well they related

their previous instructional strategies with the newly acquired ones. In the end, Kim et al. concluded with the findings that implementing a new program in the teachers' classroom provided them with the opportunity to reflect on their practices while embracing new, innovative strategies that motivate and enhance student learning.

As noted previously, technology has the ability to engage students in a 21st century curriculum; unfortunately, if principals do not value its usefulness and model it in their daily practices, the likelihood of classroom integration drops. The youth of America are incorporating technology into their daily lives at an astounding rate. If we are not able to tap into that tool as educators, we are not preparing students as best we can. The review of literature demonstrated that more research is needed on this topic. This study, by focusing on the principal's perceptions toward technology, will provide valuable data to determine how close we are to fulfilling technology's promise.

Chapter 3: Methods

The purpose of this study is to understand the importance of technology in 21st century schools and the impact it has had on principals, counselors, teachers, and students. It will focus on understanding the principals' perceptions of technology and how it has influenced their daily roles as school leaders. This chapter describes the methods used to investigate these questions, and is organized into the following sections: Research Design, Participants, Instrumentation, Procedures, and Limitations.

Research Design

This study is an exploratory inquiry using a subset of the archived data from a much larger, multi-phase study of principals in the Gulf Coast Region of Southeast Texas. It is part of phase one of the study, and focuses exclusively on the section of the survey dealing with principals' perceptions of how technology has influenced the roles of principals, counselors, teachers, and students. The original survey project used a cross-sectional, cognitive interview design, and targeted subjects who were currently serving as principals in Texas K-12 public schools. As a course requirement, graduate students in a master's degree program administered the survey questionnaire to principals in an interview setting over an 18-month period. The resulting data from the principal survey project was then compiled and archived in a database for use in future research projects on specific aspects of school leadership.

While phase one of the project used predominately quantitative survey research methods, the technology section of the survey consisted entirely of open-ended questions

that lend themselves to the type of interpretive analysis associated with qualitative research. In addition, responses will be analyzed for significant relationships with selected principal and campus demographics. As a result, a qualitative research approach will be employed in the analysis phase of this study.

Participants

The participants in this study were 310 current campus principals. No other school or district personnel were involved in this survey project. Although 8 charter and 20 private school principals were included in this survey, it primarily represents the perceptions of public school principals. With regard to demographics, respondents included 178 female and 122 male principals with 10 not reporting, and an ethnic breakdown of 66% Anglo, 22% African-American, and 12% Hispanic. This breakdown, represented in Table 3.1 and 3.2, is based on the research participants' self-reported data.

Table 3.1

Frequency and Percentage of Participants' Gender

Gender	f	%
Not Reported	10	3.2%
Female	178	57.4%
Male	122	39.4%
Total	310	100.0%

Table 3.2

Frequency and Percentage of Participants' Ethnicity

Ethnicity	<i>f</i>	%
Not Reported	3	1.0%
Asian/Pacific	2	0.7%
African-American	64	20.6%
Hispanic	35	11.3%
Anglo	206	66.4%
Total	310	100.0%

All public schools in the state of Texas are given a state accountability rating (Exemplary, Recognized, Acceptable, and Low-performing) based on student achievement, attendance, and dropout rates. Principals were asked to self-report their accountability rating in the principal survey. Responding principals represented schools in each of the following categories as illustrated in Figure 3.3: 9.4% Exemplary, 30.7% Recognized, 46.1% Acceptable, and 1.9% Low Performing. 11.9% of the respondents did not include their campus' state accountability rating in their survey. This could be due to the fact that they are private, charter, or new schools that are not currently subject to the state's accountability rating.

Table 3.3

Frequency and Percentage of Participants' Campus TEA Rating

Ethnicity	f	%
Not Reported	37	11.9%
Exemplary	29	9.4%
Recognized	95	30.7%
Acceptable	143	46.1%
Low Performing	6	1.9%
Total	310	100.0%

With regard to grade levels served, principals identified themselves as leading schools that were classified as elementary, middle, and high schools. The 310 responses included principals from 150 elementary schools (K-5), 64 middle schools (6-8), 66 high schools (9-12), and 17 mixed-grade schools. The remaining 13 schools' grade levels were not reported.

Participants also represented three geographic settings: rural, suburban, and urban. Almost half 48.0% (149) of the principals surveyed were currently administrators at a suburban school. Urban principals accounted for 43.9% (136) of the respondents, and 6.8% (21) classified their schools being located in a rural setting. Four principals (1.3%) did not report the geographical settings of their campuses. Student enrollment among the 310 schools varied greatly depending on the geographic location, grade levels served, and purpose of the school. The largest enrollment was at a suburban high school with 5,000 students while the smallest was 48 students at a rural campus serving troubled youth in a mixed-grade level setting.

Instrumentation

The principal survey questionnaire was developed by university professors at a major doctoral granting institution in a large, urban area in the south-central area of the United States for use in graduate-level courses in educational leadership. The overall survey instrument included 115 items, 22 of which dealt with principals' backgrounds and school demographics. 62 were Likert-scaled items, and 31 were open-ended questions requiring in-depth, descriptive answers. The survey was organized into 14 sections, designated as Sections A through N, with each section specifically focused on a particular aspect of school leadership. This study focuses on the open-ended responses to Section M of the survey concerning principals' perceptions of technology's influence on their campuses. By using an open-ended question, the respondents were able to express their views in as much detail as they wanted, without being restricted to a predetermined range of answers.

The three research questions contained in this section of the study were:

1. To what extent has technology made a difference at your school?
2. How has it influenced teachers, counselors, and students?
3. How has it influenced your role as a principal?

Procedures

The designers of the survey had several factors to consider when deciding how to administer the survey. Beyond reporting demographics, the questions on the survey were complex and designed to elicit reflective responses. Due to the length and complexity of the survey questions, sending out the survey by mail or electronically was considered

impractical. It was unrealistic to expect busy principals to take time from their schedules to complete the survey in its entirety. In addition, the designers were concerned with respondent fatigue when completing such a long survey. Under these conditions, the designers chose to use a cognitive interview protocol guided by an interviewer. It was believed this protocol would allow the principals to give quality answers throughout the survey due to the fact they were interacting with another person.

The cognitive interview protocol was implemented in this study by having students in the university's Master's degree program in Educational Leadership administer the survey. A benefit of using the cognitive interview protocol is that the resulting data contains the type of insights normally found in qualitative studies and interviews while maintaining the quantitative characteristics of traditional surveys (Willis, 2005). While utilizing this type of interview protocol was time consuming, it allowed the interviewers to make sure the principals understood each question's intent and answered appropriately. Class time was dedicated to familiarizing the students with the survey instrument and the overall goals of the study. They were also trained in both traditional survey and cognitive interview techniques prior to their fieldwork in interviewing subjects. A portion of each student's grade in the course was based on his/her satisfactorily completing the required number of surveys, thereby helping insure the dedication of the individuals charged with administering the survey. The student interviewers were permitted to choose which principals they would interview, presumably administrators in the same district in which they worked. The survey designers hoped this connection would help insure the principals' commitment by appealing to their roles in mentoring and developing future principals. The data collected

from these interviews was then maintained by the university as an archival source for analyses in researching various questions regarding public school leadership from a principal's perspective, such as this study.

The survey was administered over a period of 18 months, with different groups of graduate students administering the survey each semester during that time period. As a result of the convenience sample selection technique used, there were numerous occasions where the same principal participated in the survey more than once. This occurrence can be attributed to both the lack of restrictions on the student to choose which principals they wanted to interview, as well as the working relationship nature of the principals' participation in the study. A total of 178 duplicate survey responses were deleted from the dataset used in this paper, resulting in the final sample set of 310 principals. An unintended advantage of these duplicated interviews provided the researchers with the opportunity to establish the test-retest validity of the principals' responses over multiple survey administrations. The large number of interviewers used in administering this survey established instrument reliability in accurately recording the views of the respondents independent of who administered the survey since no incidents were found in which a principal's opinion changed in a meaningful way from one interview to another. In all cases in which a principal was interviewed more than once, only the first response was included in the final dataset. All ensuing responses were examined for internal consistency but omitted from the final dataset.

The open-ended nature of the survey questions was intended to give principals the most freedom and flexibility in their responses. As a result, one of the first steps in

working with the data is to identify, categorize, and code the themes that emerge from the three open-ended questions. This will allow the responses to be classified according to their commonalities, thereby leading to useful insights about these principals' collective views about technology's influence. Once the main themes are identified, these themes will be given an operational definition, and each response will be assigned to one of these categorical definitions. Where responses included aspects of multiple categories, the main aspect from the response will be used for coding purposes. Subsequently, each response will be coded to only one category. The predominant themes for each of the questions will be identified and discussed in the next chapter.

Limitations

There are four limitations to this study. During the data collection process for this study, graduate students were allowed to choose any four principals to interview for this study resulting in a convenience sample. If a principal chose not to participate, the graduate student simply found a replacement principal who volunteered. Because of this, there is no way to guarantee that principals as a population were represented in the sample. Also, the number of principals who chose not to participate was not reported.

Second, while the survey was administered to principals exclusively, they were asked to give their perceptions about technology's influence on teachers, counselors, and students. While the principals are certainly knowledgeable in the area, it would have been beneficial to survey teachers, counselors, and students to obtain first-hand data about technology's influence. If the same survey questions were posed to teachers, counselors, and students, different answers and perspectives might have been obtained.

Third, because this study relies on archived data, it is impossible to verify the integrity of the data set or assess whether or not errors were made in the coding, organization, or retrieval of the data set. This is a limitation of all archived, secondary data sets. Finally, since the interviewers did not record their sessions, it is possible that some of the data collected could have been transcribed incorrectly or imbued with the transcriber's sense making as opposed to the respondent's original meaning. There is no way to check the validity of the responses turned in by the graduate students for the survey because of this lack of record.

Chapter 4: Results

For this study, 310 principals from a large Gulf Coast metropolitan area were interviewed. A combination of traditional survey and cognitive interviewing techniques was used to address the questions related to principals' perceptions regarding the influence of technology on their campuses. Background information of the principals and demographic information about their respective schools were obtained in a standard survey format.

The survey interview collected both individual and demographic data on the principals themselves, as well as campus demographic data where the principals worked. Individual demographic data selected for use in this study included:

- Years of experience as a campus principal; and
- Gender.

Campus demographic data used in this study included:

- State accountability rating (i.e., exemplary, recognized, acceptable, and low performing);
- Community type (i.e., rural, urban, suburban); and
- Grade levels served by the campus.

A description of each variable including the frequency and percentage is presented in Tables Table 4.1 – Table 4.5. The sample included 310 principals from Texas. Results were analyzed using descriptive statistics to show the demographic data and background characteristics of the principals in this study. This background data will

be analyzed when considering each of the three open-ended questions asked in the principal survey.

1. How has technology influenced the role of a principal?
2. What is the principal's perception of the extent technology has made a difference in the school?
3. What is the principal's perception of how technology has influenced teachers, counselors, and students?

Participants' Years of Experience as a Principal. Participants were asked to self-report their years of experience as a campus principal. However, the survey questionnaire did not provide for categorical ranges for responses to this question. Therefore, ranges were devised and the principals' responses were assigned. The data in Table 4.1 provides a summary of these ranges. The majority of the participants had 5 years or less experience as a principal ($N = 156$, 50.3%).

Table 4.1

Frequency and Percentage of Participants' Years of Experience as a Principal

Years of Experience	<i>f</i>	% of Total
Not Reported	6	1.9%
1-5	156	50.3%
6-10	73	23.6%
11-15	44	14.2%
16-20	20	6.5%
21+	11	3.5%
Total	310	100%

Participants' Gender. As illustrated in Table 4.2, more principals participating in this study were women ($N = 178$, 57.4%) than men ($N = 122$, 39.4%), with 3.2% not reporting their gender.

Table 4.2

Frequency and Percentage of Participants' Gender

Gender	f	%
Not Reported	10	3.2%
Female	178	57.4%
Male	122	39.4%
Total	310	100.0%

Participants' Campus TEA Accountability Ratings. All public schools in the state of Texas are given a state accountability rating (exemplary, recognized, acceptable, and low performing) based on student achievement, attendance, and dropout rates. Principals were asked to self-report their accountability rating in the principal survey. As shown in Table 4.3, principals' reporting of their schools' ratings indicated the majority were from schools who received the TEA accountability rating of acceptable ($N = 143$, 46.1%) and recognized ($N = 95$, 30.7%). Texas accountability ratings were not reported for 37 of the schools included in the survey results.

Table 4.3

Frequency and Percentage of Participants' Campus TEA Accountability Ratings

Accountability Rating	<i>f</i>	% of Total
Not Reported	37	11.9%
Exemplary	29	9.4%
Recognized	95	30.7%
Acceptable	143	46.1%
Low Performing	6	1.9%
Total	310	100%

Participants' Districts' Geographical Setting. As part of the survey interview, principals were asked to report their schools' classification as "Urban," "Suburban," or "Rural" based on what the questionnaire termed "Location." Demonstrated in Table 4.4, principals in the sample were predominately from suburban ($N = 145$, 46.8%) and urban districts ($N = 136$, 43.8%). Principals from rural districts ($N = 25$, 8.1%) made up a smaller percentage of the total number of respondents ($N = 310$, 100%).

Table 4.4

Frequency and Percentage of Participants' Districts' Geographical Setting

Geographical Setting	<i>f</i>	% of Total
Not Reported	4	1.3%
Rural	25	8.1%
Urban	136	43.8%
Suburban	145	46.8%
Total	310	100%

Participants' Campus Grade Levels. The study included principals working in a wide variety of school settings. For the purposes of this study, high schools are defined as those serving grades 9-12; middle schools are defined to include schools serving any mix of grades 6-8; elementary schools are defined as those serving pre-kindergarten through grade 5. The mixed grade level schools are those that clearly serve students from two or more of the categories given. Table 4.5 demonstrates that principals represented elementary schools ($N = 150$, 48.4%), middle schools ($N = 64$, 20.7%), high schools ($N = 66$, 21.3%), and mixed grade schools ($N = 17$, 5.5%).

Table 4.5

Frequency and Percentage of Participants' Campus Grade Levels

Grade Levels	<i>f</i>	% of Total
Not Reported	13	4.1%
Elementary School	150	48.4%
Middle School	64	20.7%
High School	66	21.3%
Mixed Grades	17	5.5%
Total	310	100%

In addition to the demographic information collected, the exploratory nature of the use of technology section lent itself to open-ended questions. The open-ended response format allowed for elaboration by the respondent in answering the question. Since the principal's leadership influence can set the tone for campus's technology integration into the curriculum, it was critical to obtain the perceptions of the instructional leader regarding its use.

Research Question One: *How has technology influenced the role of a principal?*

The first research question regarding technology asked the principals about their perception of how technology had influenced their roles as principals. The coding produced four response categories within which the principals' responses fell:

- Positive Influence;
- Moderate Influence;
- No Influence; or
- Negative Influence.

Positive Influence refers to any answer that included superlatives to describe the effect technology had on their role as a principal. For example, these types of answers used adjectives such as “quicker,” “easier,” “crucial,” and “great.” *Moderate Influence* refers to answers that discussed various ways technology had impacted their roles, but did not elaborate as to whether the impact was beneficial. *No Influence* refers to responses in which participants indicated that technology had not influenced their roles. *Negative Influence* refers to any answer that reflects a way in which technology had made their roles as principals more difficult. Since the participants were allowed to express their answers freely, not every principal responded to the question of how his/her role as principal had been influenced by technology.

Table 4.6

Frequency and Percentage of Participants Mentioning Technology's Influence with Principals

Responses	<i>f</i>	% of Total
Principal Comments	68	21.9%
Total	310	100%

Table 4.7

Frequency and Percentage of Participants Mentioning Technology's Influence with Principals

Responses	<i>f</i>	% of Total
Positive Influence	34	50.0%
Moderate Influence	14	20.6%
No Influence	1	1.5%
Negative Influence	19	27.9%
Total	68	100%

As shown in Table 4.7, 50% of the principals responding to this question in the survey agreed that technology had made a beneficial impact in their roles as principals. Some example statements of this belief from the principals' open-ended responses to this question are:

- "It has made my job much easier."
- "Administratively, it has made a huge difference from ease of communication, to reviewing new teacher candidates, to receiving educational updates."

- “Technology has made communication easier and faster. This allows me to communicate better with teachers and parents.”
- “As a principal, I love the part that technology plays in my role, so it is easy for me to advocate technology in record keeping, lesson planning, and instruction.”
- “It has allowed us to communicate with our parents more effectively. Teachers are able to use different teaching methods to reach all students. It has allowed me to effectively communicate with teacher and parents as well as work efficiently on fiscal matters and presentations.”
- “As a principal, it allows me to operate more efficiently.”

The second most prevalent belief that principals reported was that technology had moderately influenced their roles as principals. Over 20% of the respondents discussed how they had made decisions for the campus based on the technology needs of their building. Some example statements of this belief from principals’ open-ended responses are:

- “As a principal, I will ensure that my teachers continue to incorporate technology into their classrooms, as well as offering a technology class to our junior high students.”
- “As a principal, you must get your staff to teach the TEKS.”
- “Technology as a management tool has influenced all tasks over the last several years.”
- “I have to prepare or include technology in my staff professional development.”

- “Principals are being Intel trained and are expected to use Palm Pilots and technology daily.”
- “As a principal, I recognize the need for technology.”
- “Principals must use it.”

Table 4.8

Frequency and Percentage of Participants’ Responses by Gender (Technology’s Positive Influence or Moderate Influence on their Role as a Principal)

Gender	<i>f</i>	% of Total
Female	32	66.7%
Male	16	33.3%
Total	48	100%

Table 4.9

Frequency and Percentage of Participants’ Responses by Schools’ TEA Rating (Technology’s Positive Influence or Moderate Influence on their Role as a Principal)

Accountability Rating	<i>f</i>	% of Total
Not Reported	7	14.6%
Exemplary	4	8.3%
Recognized	14	29.1%
Acceptable	23	48.0%
Low Performing	0	0.0%
Total	48	100%

Table 4.10

Frequency and Percentage of Participants' Responses by Schools' District (Technology's Positive Influence or Moderate Influence on their Role as a Principal)

Geographical Setting	<i>f</i>	% of Total
Not Reported	1	2.0%
Rural	1	2.0%
Urban	23	48.0%
Suburban	23	48.0%
Total	48	100%

Table 4.11

Frequency and Percentage of Participants' Responses by Schools' Grade Levels (Technology's Positive Influence or Moderate Influence on their Role as a Principal)

Grade Levels	<i>f</i>	% of Total
Not Reported	3	6.2%
Elementary School	25	52.1%
Middle School	13	27.1%
High School	6	12.5%
Mixed Grades	1	2.1%
Total	48	100%

While only one principal reported that technology had not influenced his role as a principal, 27.9% of the participants responded by voicing their concerns that technology had negatively impacted their current positions. Some example statements of this opinion from principals' open-ended responses to this question are:

- “Makes my life harder with e-mail. I think computers are very expensive pencils and pens, and they haven't impacted us the way they were intended to. They are an expensive word processor for kids; but even though internet is out there, kids are still plagiarizing.
- “None. I don't care about technology.”
- “It has reduced the amount of time we are given to complete reports, etc. In this age of e-mail, everyone wants an immediate answer. I also believe that the influence of visual stimulation has changed the way children process information and it is difficult for a school setting to address their needs.”
- “It has very little influence on me and the staff.”
- “It's my lowest priority.”
- “It makes things harder for administrators. We can't just walk into the classroom and pick up the lesson plans off a teacher's desk.”
- “For me, it's eaten up a lot of my time.”
- “Due to the large number of emails and the ease of accessibility the principal must now find time to read 50+ emails per day and many may not be necessary.”

Table 4.12

*Frequency and Percentage of Participants' Responses by Years of Experience
(Technology's No Influence or Negative Influence on their Role as a Principal)*

Years of Experience	<i>f</i>	% of Total
1-5	12	60.0%
6-10	6	30.0%
11-15	1	5.0%
16-20	0	0.0%
21+	1	5.0%
Total	20	100%

Table 4.13

Frequency and Percentage of Participants' Responses by Gender (Technology's No Influence or Negative Influence on their Role as a Principal)

Gender	<i>f</i>	% of Total
Female	10	50.0%
Male	10	50.0%
Total	20	100%

Table 4.14

*Frequency and Percentage of Participants' Responses by Schools' TEA Rating
(Technology's No Influence or Negative Influence on their Role as a Principal)*

Accountability Rating	<i>f</i>	% of Total
Not Reported	1	5.0%
Exemplary	2	10.0%
Recognized	7	35.0%
Acceptable	10	50.0%
Low Performing	0	0.0%
Total	20	100%

Table 4.15

*Frequency and Percentage of Participants' Responses by Schools' District (Technology's
No Influence or Negative Influence on their Role as a Principal)*

Geographical Setting	<i>f</i>	% of Total
Rural	2	10.0%
Urban	10	50.0%
Suburban	8	40.0%
Total	20	100%

Table 4.16

*Frequency and Percentage of Participants' Responses by Schools' Grade Levels
(Technology's No Influence or Negative Influence on their Role as a Principal)*

Grade Levels	<i>f</i>	% of Total
Not Reported	1	5.0%
Elementary School	9	45.0%
Middle School	4	20.0%
High School	5	25.0%
Mixed Grades	1	5.0%
Total	20	100%

Research Question Two: *What is the principal's perception of the extent technology has made a difference in the school?*

The second research question regarding technology asked the principals about their perceptions of how technology had made a difference in their schools. The same four coding response categories were used again:

- Positive Influence;
- Moderate Influence;
- No Influence; or
- Negative Influence.

This question received the most comments from the survey participants of the three delivered in the questionnaire. 265 of the 310 principals mentioned some way that technology had made an impact on their campuses.

Table 4.17

Frequency and Percentage of Participants Mentioning Technology's Influence with their Schools

Responses	<i>f</i>	% of Total
Principal Comments	265	85.5%
Total	310	100%

Table 4.18

Frequency and Percentage of Participants Mentioning Technology's Influence with their Schools

Responses	<i>f</i>	% of Total
Positive Influence	200	75.5%
Moderate Influence	43	16.2%
No Influence	15	5.7%
Negative Influence	7	2.6%
Total	265	100%

As demonstrated in Table 4.18, over 75% of the responding participants to this question agreed that technology had made a positive difference in their schools. Since the participants were allowed to express their answers freely, not every principal responded to this question specifically. Responding comments that fell into this category included superlatives to describe the effect technology had on their campus. For example, these types of answers used comments such as “improved instruction,” “influences data-driven decisions,” and “improve student performance.” Some example statements of this belief from the principals’ open-ended responses to this question are:

- “Technology has made a difference in our school because it serves as a needed resource for both our teachers and students. With the use of technology we have been able to meet the needs of our low performing students with giving computer based assessments.”
- “My school is extremely technically advanced. It has made information more accessible for teachers as well as students. It has also given us the ability to deliver instruction in a fresh way that is up to date and interesting to our students.”
- “Technology is an important feature of our educational philosophy. We use it very effectively through school-wide software and online education sites.”
- “This year we added a new computer lab and next year computers for every classroom, with training for the teachers.”
- “It has made a great difference. It has influenced how we teach, interact and keep documentation.”
- “It's been a tool to develop critical thinking. We have technology TEKS that we teach and I support the teaching. We have incorporated library station rotations which use a lot of technology as well.”
- “Technology in rural schools brings the world to the children. Virtual field trips give kids the opportunity to see things they would have never seen before.”
- “Technology has provided a quick and easy way to inform staff about events and other *business* items so that staff development truly focuses on improving instruction.”
- “It has provided data that is easily available for individual teachers or students.”

- “Technology has helped improve student performance and boost the self esteem of students who have not otherwise responded to traditional learning tools, and are now adapting successfully to the regular learning environment.”
- “Technology as a management tool has influenced all tasks over the last several years. We maintain web sites to increase communication & can send out mass emails to our community. We get data back from assessments in any format needed to help us compare student groups and track student progress.”

The second most prevalent belief that principals reported during the second question on the survey was that technology had *Moderately Influenced* their schools. *Moderate Influence* refers to answers that discussed various ways technology had impacted their buildings, but did not elaborate as to whether the impact was favorable. Just over 16% of the respondents discussed how they had made decisions for the campus based on the technology needs of their building. Some example statements of this belief from principals’ open-ended responses are:

- “Technology plays a part in our school. Each teacher is required to put into their lesson plans where the student is required to use the computer.”
- “It's just another resource or tool to help us teach our kids.”
- “We live in a technology world; therefore we must step up to the plate.”
- “Technology has somewhat influenced the school.”
- “Technology is only a tool and not an entity unto itself. In other words, we use technology as another means in which to meet the needs of the students.”
- “Technology is used by everyone on campus.”

- “There is no replacement for effective teaching, but we utilize technology as a resource.”
- “It has made management easy, but instructional quality is hard to measure.”
- “Technology must be encouraged and training must be provided.”

Table 4.19

*Frequency and Percentage of Participants’ Responses by Years of Experience
(Technology’s Moderate Influence or Positive Influence on their Schools)*

Years of Experience	<i>f</i>	% of Total
Not Reported	6	2.5%
1-5	118	48.4%
6-10	56	22.9%
11-15	36	14.7%
16-20	19	7.8%
21+	9	3.7%
Total	244	100%

Table 4.20

*Frequency and Percentage of Participants’ Responses by Gender (Technology’s
Moderate Influence or Positive Influence on their Schools)*

Gender	<i>f</i>	% of Total
Not Reported	10	4.1%
Female	101	41.3%
Male	133	54.6%
Total	244	100%

Table 4.21

*Frequency and Percentage Of Participants' Responses by Schools' TEA Rating
(Technology's Moderate Influence or Positive Influence on their Schools)*

Accountability Rating	<i>f</i>	% of Total
Not Reported	31	12.7%
Exemplary	26	10.7%
Recognized	71	29.1%
Acceptable	112	45.9%
Low Performing	4	1.6%
Total	244	100%

Table 4.22

*Frequency and Percentage of Participants' Responses by Schools' District (Technology's
Moderate Influence or Positive Influence on their Schools)*

Geographical Setting	<i>f</i>	% of Total
Not Reported	3	1.2%
Rural	14	5.8%
Urban	103	42.2%
Suburban	124	50.8%
Total	244	100%

Table 4.23

*Frequency and Percentage of Participants' Responses by Schools' Grade Levels
(Technology's Moderate Influence or Positive Influence on their Schools)*

Grade Levels	<i>f</i>	% of Total
Not Reported	7	2.9%
Elementary School	118	48.4%
Middle School	51	20.9%
High School	53	21.7%
Mixed Grades	15	6.1%
Total	244	100%

As shown in Table 4.18, , less than 10% of the respondents who commented on this question answered that technology had *No Influence* or a *Negative Influence* on their schools. There were 15 comments that were categorized into the *No Influence* grouping. Some example statements of this view from principals' open-ended responses to this question are:

- “Not much.”
- “Not this year because we are in a transition year with moving into our new building next August.”
- “None.”
- “Hasn't.”
- “In the classroom, not much difference.”
- “It doesn't make as much an impact as we think.”
- “It has not made a big impact as of yet.”

As demonstrated in Table 4.18, 2.6% of the respondents' comments were categorized under the *Negative Influence* theme. Some example statements of this view from principals' open-ended responses to this question are:

- “At times it can be a headache.”
- “The district talks about it, but does not support it consistently with all campuses.
My teachers do not have printers. I have a computer lab, but it has not been set up yet. There is a real disconnect and difference when you consider all schools.
Demographics play a considerate role.”
- “Our school is not properly equipped.”
- “E-mail can be destructive because of the immediacy.”
- “It has made little difference as our school is running about 14 different operating systems, including both Mac and Windows. It is frustrating.”

Table 4.24

*Frequency and Percentage of Participants' Responses by Years of Experience
(Technology's No Influence or Negative Influence on their Schools)*

Years of Experience	<i>f</i>	% of Total
1-5	16	76.2%
6-10	3	14.2%
11-15	1	4.8%
16-20	0	0.0%
21+	1	4.8%
Total	21	100%

Table 4.25

Frequency and Percentage of Participants' Responses by Gender (Technology's No Influence or Negative Influence on their Schools)

Gender	<i>f</i>	% of Total
Female	6	28.6%
Male	15	71.4%
Total	21	100%

Table 4.26

Frequency and Percentage of Participants' Responses by Schools' TEA Rating (Technology's No Influence or Negative Influence on their Schools)

Accountability Rating	<i>f</i>	% of Total
Exemplary	0	0.0%
Recognized	9	42.8%
Acceptable	11	52.4%
Low Performing	1	4.8%
Total	21	100%

Table 4.27

Frequency and Percentage of Participants' Responses by Schools' District (Technology's No Influence or Negative Influence on their Schools)

Geographical Setting	<i>f</i>	% of Total
Rural	4	19.0%
Urban	14	66.7%
Suburban	3	14.3%
Total	21	100%

Table 4.28

*Frequency and Percentage of Participants' Responses by Schools' Grade Levels
(Technology's No Influence or Negative Influence on their Schools)*

Grade Levels	<i>f</i>	% of Total
Not Reported	1	4.8%
Elementary School	7	33.3%
Middle School	7	33.3%
High School	6	28.6%
Total	21	100%

Research Question Three: *What is the principal's perception of how technology has influenced teachers, counselors, and students?*

The third research question regarding technology asked the principals about their perception on how technology has influenced teachers, counselors, and students. Because of the different roles each play in the school setting; they were examined separately. The same four coding response categories were used again:

- Positive Influence;
- Moderate Influence;
- No Influence; or
- Negative Influence.

The teacher part of the question received 82 (26.5%) comments from the survey participants on the questionnaire.

Table 4.29

Frequency and Percentage of Participants Mentioning Technology's Influence with Teachers

Responses	<i>f</i>	% of Total
Principal Comments	82	26.5%
Total	310	100%

Table 4.30

Frequency and Percentage of Participants Mentioning Technology's Influence with Teachers

Responses	<i>f</i>	% of Total
Positive Influence	32	39.0%
Moderate Influence	38	46.3%
No Influence	4	4.9%
Negative Influence	8	9.8%
Total	82	100%

As shown in Table 4.30, 39% of the survey participants commented during their interviews how technology had a *Positive Influence* on teacher roles at their campuses. Responding comments that fell into this category included superlatives to describe the effect technology had influenced teachers. For example, these types of answers used comments such as “improved teaching,” “creative lessons,” and “great resource.” Some example statements of this belief from the principals’ open-ended responses to this question are:

- “I am now seeing technology incorporated into the instructional program in many classrooms. Teachers are able to gather and use student data to learn more about the needs of their students.”
- “For the teachers, it’s saving time.”
- “Some of the teachers’ tasks have been made easier: like lesson planning and averaging grades. The access to other teachers is nice to build collaboration and have access to other great minds with email capability.”
- “Tremendous difference! Yes. Lessons design and delivery.”
- “Improves instruction and skill level of teachers.”
- “The gradebook program has made teacher's jobs easier.”
- “Teachers can e-mail parents to communicate in a more improved way.”
- “Teachers are able to use different teaching methods to reach all students.”
- “It has influenced the creativity and amount of things that teachers are able to complete.”

Almost half of the principals reported during this question on the survey that technology had *Moderately Influenced* their teachers. *Moderate Influence* refers to answers that discussed various ways technology had impacted teacher roles, but did not elaborate as to whether the impact was favorable. Some example statements of this belief from principals’ open-ended responses are:

- “The Internet opens many options for educators.”
- “Teachers: sharing and preparing instructional materials.”
- “It is a given that teachers will use more technology than last year and so on.”

- “Our teachers have to use the technology to keep up with their daily duties as a classroom teacher.”
- “Many teachers use PowerPoint presentations and other technology in class.”
- “Teachers can use technology with lesson plans, virtual streaming of videos.”
- “Teachers use it to plan.”
- “From an instructional standpoint, it is changing so quickly there is a real need to keep teachers abreast of how to use the ever-changing technology to inform instructional decisions.”
- “Teachers use technology now more.”

Table 4.31

*Frequency and Percentage of Participants' Responses by Years of Experience
(Technology's Moderate Influence or Positive Influence on their Teachers)*

Years of Experience	<i>f</i>	% of Total
Not Reported	1	1.4%
1-5	36	51.4%
6-10	17	24.3%
11-15	4	5.7%
16-20	9	12.9%
21+	3	4.3%
Total	70	100%

Table 4.32

Frequency and Percentage of Participants' Responses by Gender (Technology's Moderate Influence or Positive Influence on their Teachers)

Gender	<i>f</i>	% of Total
Not Reported	1	1.4%
Female	39	55.7%
Male	30	42.9%
Total	70	100%

Table 4.33

Frequency and Percentage of Participants' Responses by Schools' TEA Rating (Technology's Moderate Influence or Positive Influence on their Teachers)

<i>Frequency and Percentage of Participants' Campus TEA Accountability Ratings</i>		
Accountability Rating	<i>f</i>	% of Total
Not Reported	9	12.9%
Exemplary	6	8.6%
Recognized	22	31.4%
Acceptable	32	45.7%
Low Performing	1	1.4%
Total	70	100%

Table 4.34

Frequency and Percentage of Participants' Responses by School District (Technology's Moderate Influence or Positive Influence on their Teachers)

Geographical Setting	<i>f</i>	% of Total
Not Reported	2	2.9%
Rural	0	0.0%
Urban	35	50.0%
Suburban	33	47.1%
Total	70	100.0%

Table 4.35

Frequency and Percentage of Participants' Responses by Schools' Grade Levels (Technology's Moderate Influence or Positive Influence on their Teachers)

Grade Levels	<i>f</i>	% of Total
Not Reported	3	4.3%
Elementary School	35	50.0%
Middle School	21	30.0%
High School	6	8.6%
Mixed Grades	5	7.1%
Total	70	100%

As shown in Table 4.30, less than 15% of the respondents who commented on this question during their interview answered that technology had *No Influence* or a *Negative Influence* on their teachers. There were four comments that were categorized into the *No Influence* grouping. Some example statements of this view from principals' open-ended responses to this question are:

- “Not as big of a difference in instruction.”
- “Teachers are still leaning how to integrate technology.”
- “In the classroom, not much difference.”

In this section, almost 10% of the respondents’ comments were categorized under the *Negative Influence* theme. The majority of principals’ comments in this theme dealt with reluctant teachers or teachers using computers for personal business. Some example statements of this view from principals’ open-ended responses to this question are:

- “Many teachers have been avoiding technology in the classroom and have been using *old school* methods to teach kids.”
- “I am finding that the more technology we get, the more resistant teachers become because they do not have enough training.”
- “I think the teachers are a little intimidated by the idea of an on-line curriculum and using PowerPoint in the classroom, etc. ”
- “Unfortunately in many cases, technology, i.e., email or the Internet, have been a huge distraction and taken away from learning because of teachers taking care of personal business.”
- “Teachers might be online when they should be teaching.”

Table 4.36

*Frequency and Percentage of Participants' Responses by Years of Experience
(Technology's No Influence or Negative Influence on their Teachers)*

Years of Experience	<i>f</i>	% of Total
1-5	9	75.0%
6-10	2	16.7%
11-15	1	8.3%
16-20	0	0.0%
21+	0	0.0%
Total	12	100%

Table 4.37

Frequency and Percentage of Participants' Responses by Gender (Technology's No Influence or Negative Influence on their Teachers)

Gender	<i>f</i>	% of Total
Female	6	50.0%
Male	6	50.0%
Total	12	100%

Table 4.38

*Frequency and Percentage of Participants' Responses by Schools' TEA Rating
(Technology's No Influence or Negative Influence on their Teachers)*

Accountability Rating	<i>f</i>	% of Total
Not Reported	1	8.3%
Exemplary	3	25.0%
Recognized	1	8.3%
Acceptable	7	58.4%
Low Performing	0	0.0%
Total	12	100%

Table 4.39

*Frequency and Percentage of Participants' Responses by Schools' District (Technology's
No Influence or Negative Influence on their Teachers)*

Geographical Setting	<i>f</i>	% of Total
Rural	0	0.0%
Urban	6	50.0%
Suburban	6	50.0%
Total	12	100%

Table 4.40

*Frequency and Percentage of Participants' Responses by Schools' Grade Levels
(Technology's No Influence or Negative Influence on their Teachers)*

Grade Levels	<i>f</i>	% of Total
Elementary School	5	41.7%
Middle School	6	50.0%
High School	1	8.3%
Mixed Grades	0	0.0%
Total	12	100%

This section of the third research question regarding technology asked the principals about their perception of how technology has influenced counselors in their buildings.

The same four coding response categories were used again:

- Positive Influence;
- Moderate Influence;
- No Influence; or
- Negative Influence.

This question received the fewest comments from the survey participants out of the three delivered in the questionnaire. Only seven of the 310 principals surveyed mentioned some way that technology had influenced their counselors. Of those seven responses, five principals reported that technology had *Moderately Influenced* the counselor's role; while two said it had a *Positive Influence* on their position. No principals reported that it had *No influence* or a *Negative Influence*.

Table 4.41

Frequency and Percentage of Participants Mentioning Technology's Influence with their Counselors

Responses	<i>f</i>	% of Total
Principal Responses	7	2.3%
Total	310	100%

Table 4.42

Frequency and Percentage of Participants Mentioning Technology's Influence with their Counselors

Responses	<i>f</i>	% of Total
Positive Influence	2	28.6%
Moderate Influence	5	71.4%
No Influence	0	0.0%
Negative Influence	0	0.0%
Total	7	100%

As shown in Table 4.42, of the seven comments, 28.6% of the survey participants believed that technology had a *Positive Influence* on counselors. Some example statements of this belief from the principals' open-ended responses to this question are:

- "Our counselors are able to upload student assessments a lot faster."
- "It has influenced the creativity and amount of things that counselors are able to complete."

Over 71% of the principals reported during this question on the survey that technology had *Moderately Influenced* their counselors. *Moderate Influence* refers to

answers that discussed various ways technology had impacted counselor roles, but did not elaborate as to whether the impact was favorable. Some example statements of this belief from principals' open-ended responses are:

- “Counselors: scheduling maintenance.”
- “With counselors, it has made a difference.”
- “All personnel have had extensive training and use it daily.”

Table 4.43

Frequency and Percentage of Participants' Responses by Years of Experience (Technology's Moderate Influence or Positive Influence on their Counselors)

Years of Experience	<i>f</i>	% of Total
1-5	4	57.1%
6-10	1	14.3%
11-15	1	14.3%
16-20	1	14.3%
21+	0	0.0%
Total	7	100%

Table 4.44

Frequency and Percentage of Participants' Responses by Gender (Technology's Moderate Influence or Positive Influence on their Counselors)

Gender	<i>f</i>	% of Total
Female	4	57.1%
Male	3	42.9%
Total	7	100%

Table 4.45

*Frequency and Percentage of Participants' Responses by Schools' TEA Rating
(Technology's Moderate Influence or Positive Influence on their Counselors)*

<i>Frequency and Percentage of Participants' Campus TEA Accountability Ratings</i>		
Accountability Rating	<i>f</i>	% of Total
Exemplary	0	0.0%
Recognized	2	28.6%
Acceptable	5	71.4%
Low Performing	0	0.0%
Total	7	100%

Table 4.46

*Frequency and Percentage of Participants' Responses by Schools' District (Technology's
Moderate Influence or Positive Influence on their Counselors)*

Geographical Setting	<i>f</i>	% of Total
Not Reported	1	14.3%
Rural	0	0.0%
Urban	2	28.6%
Suburban	4	57.1%
Total	7	100.0%

Table 4.47

Frequency and Percentage of Participants' Schools' Grade Levels (Technology's Moderate Influence or Positive Influence on their Counselors)

Grade Levels	<i>f</i>	% of Total
Not Reported	1	14.3%
Elementary School	1	14.3%
Middle School	3	42.857%
High School	2	28.6%
Mixed Grades	0	0.0%
Total	7	100%

As demonstrated in Table 4.42, none of the respondents who commented on this question during their interview answered that technology had *No Influence* or a *Negative Influence* on their counselors.

The final portion of the third research question dealt with the principals' perception of how technology has influenced students. The same four coding response categories were used again:

- Positive Influence;
- Moderate Influence;
- No Influence; or
- Negative Influence.

This part of the question received 69 (22.3%) comments from the survey participants on the questionnaire.

Table 4.48

Frequency and Percentage of Participants Mentioning Technology's Influence with their Students

Responses	<i>f</i>	% of Total
Principal Comments	69	22.3%
Total	310	100%

Table 4.49

Frequency and Percentage of Participants Mentioning Technology's Influence with their Students

Responses	<i>f</i>	% of Total
Positive Influence	38	55.0%
Moderate Influence	29	42.0%
No Influence	1	1.5%
Negative Influence	1	1.5%
Total	69	100%

As shown in Table 4.49, 38 of the survey participants made comments during their interviews about how technology has had a *Positive Influence* on students at their campuses. Responding comments that fell into this category included superlatives to describe the effect technology had influenced students. For example, these types of answers used comments such as “improve student learning,” “relevant to students,” “broadens opportunities,” and “expands student learning.” Some example statements of this belief from the principals’ open-ended responses to this question are:

- “I think it's getting students better prepared for the world they live in. It's opened up the world for our students, providing them with experiences they might not have had.”
- “Kids use it as a tool to enhance their content (researching for projects and using software for presentation – PowerPoint, Word, etc.).”
- “Students are able to access learning programs from home.”
- “Technology is another tool or resource to improve student learning.”
- “The internet and use of laptops in all subjects has opened up the world for kids who don't have them in their own homes.”
- “Technology can be used as a *hook* to get kids interested.”
- “Broadens the opportunity for students to expand their learning.”

As demonstrated in Table 4.49, 42% of the principals reported during this portion of the question that technology had *Moderately Influenced* their students. *Moderate Influence* refers to answers that discussed various ways technology had impacted student roles, but did not elaborate as to whether the impact was favorable. Some example statements of this belief from principals' open-ended responses are:

- “Students have access to several labs, keyboarding classes, technology application classes and computers in the library.”
- “Students are used to technology.”
- “The students of today are very comfortable with technology and multi-tasking.”
- “The use of a computer lab has allowed students to use and understand the functions of a computer.”

- “I see the kids use the Internet to find information.”
- “Students use technologies in the classroom, as an electives course, in the magnet program, etc.”
- “Students use the lab for research.”
- “It’s important to expose students to give them a tool to use.”

Table 4.50

*Frequency and Percentage of Participants’ Responses by Years of Experience
(Technology’s Moderate Influence or Positive Influence on their Students)*

Years of Experience	<i>f</i>	% of Total
1-5	37	55.2%
6-10	15	22.4%
11-15	8	11.9%
16-20	5	7.5%
21+	2	3.0%
Total	67	100%

Table 4.51

*Frequency and Percentage of Participants’ Responses by Gender (Technology’s
Moderate Influence or Positive Influence on their Students)*

Gender	<i>f</i>	% of Total
Not Reported	4	6.0%
Female	38	56.7%
Male	25	37.3%
Total	67	100%

Table 4.52

*Frequency and Percentage of Participants' Responses by Schools' TEA Rating
(Technology's Moderate Influence or Positive Influence on their Students)*

<i>Frequency and Percentage of Participants' Campus TEA Accountability Ratings</i>		
Accountability Rating	<i>f</i>	% of Total
Not Reported	10	15.0%
Exemplary	10	15.0%
Recognized	16	23.8%
Acceptable	31	46.2%
Low Performing	0	0.0%
Total	67	100%

Table 4.53

Frequency and Percentage of Participants' Responses by Schools' District (Technology's Moderate Influence or Positive Influence on their Students)

Geographical Setting	<i>f</i>	% of Total
Not Reported	1	1.5%
Rural	4	6.0%
Urban	29	43.3%
Suburban	33	49.2%
Total	67	100.0%

Table 4.54

*Frequency and Percentage of Participants' Responses by Schools' Grade Levels
(Technology's Moderate Influence or Positive Influence on their Students)*

Grade Levels	<i>f</i>	% of Total
Not Reported	2	3.0%
Elementary School	32	47.7%
Middle School	23	34.3%
High School	5	7.5%
Mixed Grades	5	7.5%
Total	67	100%

As shown in Table 4.49, only two out of the 67 comments made by the respondents who commented on this question answered that technology had *No Influence* or a *Negative Influence* on their students. Some example statements of this view from principals' open-ended responses to this question are:

- “For students, not yet.”
- “There is an increasing technology gap between economic classes.”

Table 4.55

*Frequency and Percentage of Participants' Responses by Years of Experience
(Technology's No Influence or Negative Influence on their Students)*

Years of Experience	<i>f</i>	% of Total
1-5	1	50.0%
6-10	1	50.0%
11-15	0	0.0%
16-20	0	0.0%
21+	0	0.0%
Total	2	100%

Table 4.56

Frequency and Percentage of Participants' Responses by Gender (Technology's No Influence or Negative Influence on their Students)

Gender	<i>f</i>	% of Total
Female	2	100.0%
Male	0	0.0%
Total	2	100%

Table 4.57

*Frequency and Percentage of Participants' Responses by Schools' TEA Rating
(Technology's No Influence or Negative Influence on their Students)*

Accountability Rating	<i>f</i>	% of Total
Exemplary	0	0.0%
Recognized	0	0.0%
Acceptable	2	100.0%
Low Performing	0	0.0%
Total	2	100%

Table 4.58

Frequency and Percentage of Participants' Responses by Schools' District (Technology's No Influence or Negative Influence on their Students)

Geographical Setting	<i>f</i>	% of Total
Rural	0	0.0%
Urban	2	100.0%
Suburban	0	0.0%
Total	2	100%

Table 4.59

Frequency and Percentage of Participants' Responses by Schools' Grade Levels (Technology's No Influence or Negative Influence on their Students)

Grade Levels	<i>f</i>	% of Total
Elementary School	2	100.0%
Middle School	0	0.0%
High School	0	0.0%
Mixed Grades	0	0.0%
Total	2	100%

The next chapter, Chapter Five, presents the discussion of the findings and the conclusions for this study, with implications of the study's findings and suggestions for future research.

Chapter 5: Discussion

Introduction

Principals in the 21st century school context are under pressure and searching for ways to enhance student achievement and monitor student progress. One possible tool might be the effective use of technology for enhancing instruction, communication, and for managing databases of performance data that can impact practice. When schools are successful in integrating technology, the principal is the most important factor (Byrom & Bingham, 2001). In order for this infusion of technology to occur, Byrom and Bingham declare that the principal should provide technology leadership on his/her campus and demonstrate its usefulness by using technology in his/her daily practice (2001). If a principal exhibits enthusiasm for technology uses on the campus, then teachers are more likely to follow his/her lead (see Hope, 1997; Tooms, Acomb, and McGlothlin, 2004).

Summary of the Study

The purpose of this study was to understand the importance of technology in schools and the impact it has had on principals, counselors, teachers, and students. This study focused on understanding the principal's perceptions toward technology and how it has influenced his daily roles as a school leader. Since the principal's leadership influence can set the tone for campuses technology integration into the curriculum, it was critical to obtain the perceptions of the instructional leader regarding its use. By identifying and seeking to understand the principals' perceptions of how technology has influenced schools, the goal is to realize the possibility of technology's role in enhancing student achievement.

A convenience sample selection technique was used to collect the data for this study and then archived and maintained by the university as an archival source for analyses in researching various questions regarding public school leadership from a principal's perspective, such as this study. The data was collected through a cognitive interview protocol guided by an interviewer. Students in the university's Master's degree program in Educational Leadership administered the survey. The student interviewers were permitted to choose which principals they would interview, presumably administrators in the same district in which they worked. The survey was administered over a period of 18 months, with different groups of graduate students administering the survey each semester during that time period.

Discussion of Findings

Three main research questions served as the focus of this overall study, while five research questions dealt with principal and campus demographics. Because the study used archived data from a prior survey, the first three research questions were limited to those asked in that survey. The research questions are:

1. How has technology influenced the role of a principal?
2. What is the principal's perception of the extent technology has made a difference in the school?
3. What is the principal's perception of how technology has influenced teachers, counselors, and students?
4. Do principals with varying number of years of experience as principals differ with regard to their self-reported perceptions of technology's influence?

5. Will the principals' perceptions of technology vary dependent on the gender of the principals?
6. Do principals from schools with different Texas Education Agency accountability ratings differ with regard to their self-reported perceptions of technology's influence?
7. Do principals from school districts from various geographical settings (i.e., rural, urban, etc.) differ with regard to their self-reported perceptions of technology's influence?
8. Do principals from schools representing various grade levels (i.e., elementary, middle, etc.) differ with regard to their self-reported perception of technology's influence?

Of these eight questions, the first three proved to be the most informative, while the remaining five demographic questions lacked the anticipated response patterns. Some areas lacked the number of responses to form any substantive conclusions, and others were in line with the overall demographic data in the survey. Therefore, the majority of the discussion will be focused on the first three questions with references made to the demographic questions when warranted.

Research Question One. The first research question sought to understand principals' perceptions regarding how technology had influenced their roles as principals. Each response to the question from the data was categorized as Positive Influence, Moderate Influence, No Influence, or Negative Influence. As shown in Figure 5.1, 50% of the principals reported technology had a positive influence on their roles as administrators. Of those responses, more than a third of the principals reported that

technology's positive influence was related to the benefits of electronic communications. One principal responded that, "Technology has made communication easier and faster. This allows me to communicate better with teachers and parents." This coincides with the findings of Afshari, Bakar, Luan, Samah, and Fooi in their 2008 study involving 30 secondary school principals that investigated principals' perceived level of computer use, computer competence, and leadership style (transformational and transactional). The majority of the principals who participated in that study and accessed the internet daily did so in order to receive and send electronic communication.

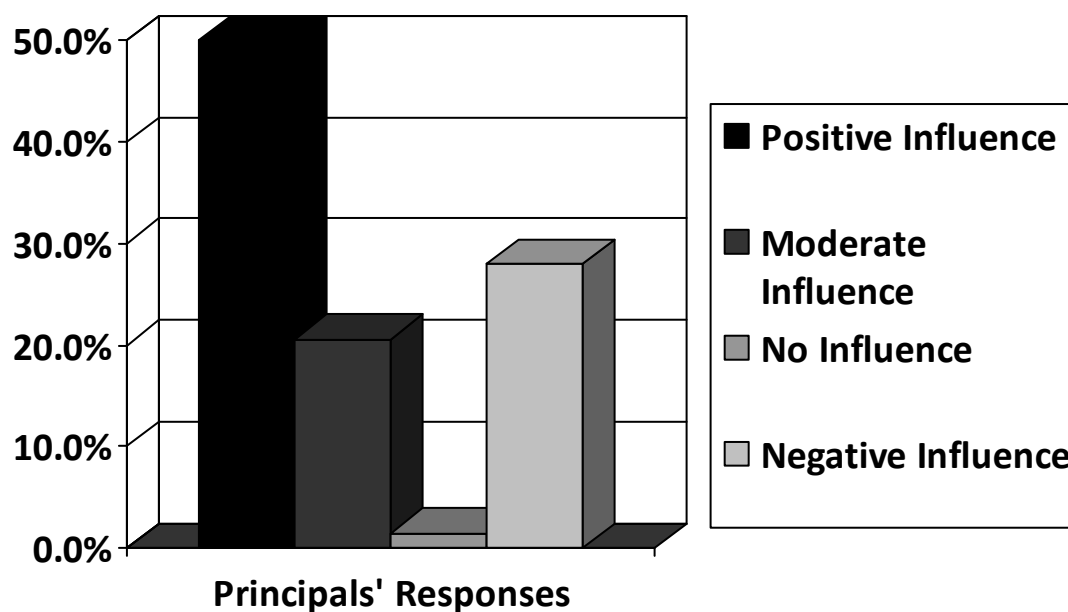


Figure 5.1

Over 23% of the principals reported that technology had made a positive influence in their abilities to view student data to make informed decisions regarding instruction. One principal noted that, "As a principal, I love the part that technology plays in my role, so it is easy for me to advocate technology in record keeping, lesson

planning, and instruction.” This is consistent with Hines, Edmonson, and Moore (2008) who stated that in today’s school environment, principals have access to large amounts of data which they must manage accordingly in order to be successful. For example, student data can be stored and sorted in an Excel spreadsheet for teachers and administrators to see student strengths and weaknesses (Haughey, 2006). This is incredibly advantageous for student achievement because students’ academic weaknesses can be identified from collated information, and a remediation plan can be put into place quickly.

Interestingly enough, of the 27.9% of respondents who were critical of technology’s influence on their roles as principals, over half of the principals reported that negative influence was due to the demands of email communication. One principal stated, “Due to the large number of emails and the ease of accessibility, the principal must now find time to read 50+ emails per day and many may not be necessary.”

Haughey also reported that technology had led principals to believe that communication was becoming too impersonal with email, and principals were spending too much time behind their computers instead of being in classrooms around the campus (2006).

Demographics. When analyzing the background data of the principals and their campuses in regard to research question one, three areas stood out: principals’ years of experience, gender, and campus grade levels. While respondents who had 10 years or less experience as principals made up almost 74% of the survey group, they accounted for more than 85% of the responses of how technology had moderate or positive influences on their roles. Likewise, this group made up 90% of the comments on how technology had no influence or a negative influence on their roles. In addition, even

though there were more females in this survey (57.4%), they were split evenly with the male principals when reporting how technology had negatively influenced their roles as principals. Whereas high school principals made up 21.3% of the respondents, this subgroup accounted for only 12.5% of the positive comments of how technology had influenced their roles as principals.

Research Question Two. The second research question sought to understand principals' perceptions regarding the extent technology had made a difference in their school. Again, each response to the question from the data was categorized as Positive Influence, Moderate Influence, No Influence, or Negative Influence. As shown in Table 4.18, over 85% of the principals surveyed commented in some way how technology had influenced their campuses; by far the most comments from the survey. From those responses, more than 75% of the principals expressed how their campuses had benefited from technology's influence, see Figure 5.2. One principal at a rural campus reported, "Technology in rural schools brings the world to the children. Virtual field trips give kids the opportunity to see things they would have never seen before." Students get excited when technology is used in the classroom, and their excitement results in a greater comprehension of the curriculum (Boon, Fore III, and Spencer, 2007).

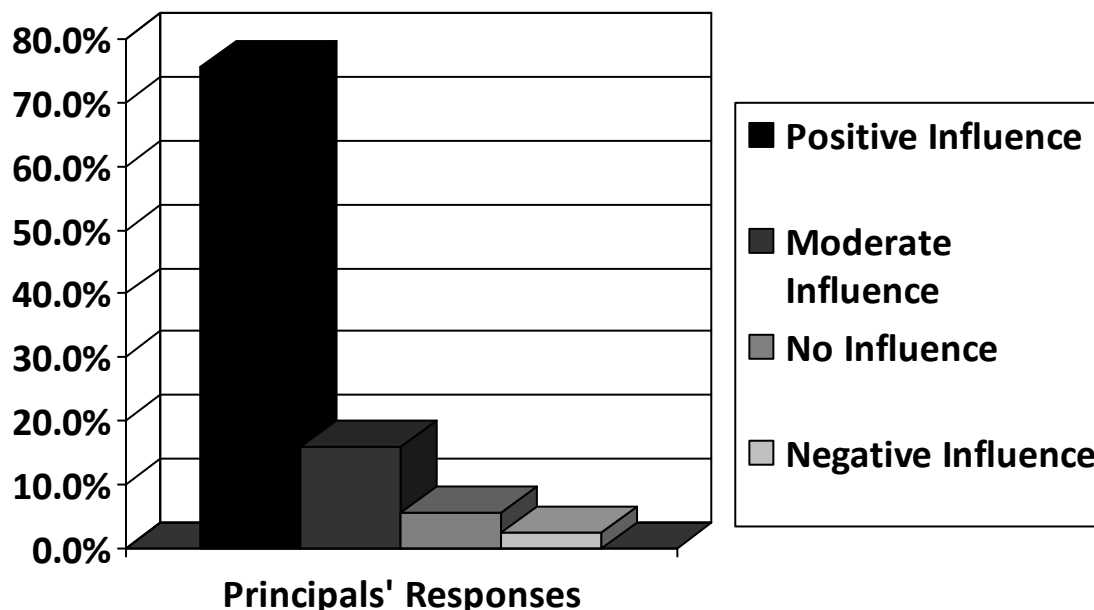


Figure 5.2

Another benefit principals had seen on their campuses concerning technology was its ability to help low-performing students achieve. One principal stated, “Technology has made a difference in our school because it serves as a needed resource for both our teachers and students. With the use of technology we have been able to meet the needs of our low performing students with giving computer based assessments.” When analyzing the data, many principals echoed those sentiments. Technology provided students with tools to be successful. As stated by one principal, “It's just another resource or tool to help us teach our kids.”

Of the 265 comments about how technology had influenced their schools, only 8.3% of the principals reported technology had no influence or a negative influence. The reason given over 50% of the time was a lack of resources. One principal reported, “We do not have access to funds for more technology nor do we qualify for grants; so the technology really has not impacted the students yet.” Another principal from an urban

elementary school stated that his school did not have the resources and believed, “There is a real disconnect and difference when you consider all schools. Demographics play a considerate role.” This digital divide between high and low resource schools has existed in American schools for many years (Valadez & Duran, 2007).

Demographics. When analyzing the background data of the principals and their campuses in regard to research question two, the majority of the comments of how technology had no influence or had negatively influenced their campuses came from principals in four demographic categories: years of experience, gender, geographical setting, and grade levels. Surprisingly, principals with five years or less experience accounted for 76.2% of these responses. Likewise, males made up 71.4% of these comments. Principals from urban schools accounted for 66.7%, while middle school principals fell into this category 33.3%.

Research Question Three. The third research question sought to understand principals’ perceptions regarding the extent technology had influenced teachers, counselors, and students. Again, each response to the question from the data was categorized as Positive Influence, Moderate Influence, No Influence, or Negative Influence. Because of the depth of this question, each group (i.e. teachers, counselors, and students) was analyzed as if they were separate research questions. The first group, teachers, received 82 comments from the principals during the survey. From those comments, 39% were categorized as positive influence while 46.3% listed comments that fell into the moderate influence theme.

When explaining how technology had been a positive influence on teachers, an urban middle school principal said, “It has enhanced instruction in the classrooms.” Many of the principals’ comments echoed this sentiment and described how lesson delivery had been improved due to the available technology on their campuses. Another principal at a suburban elementary school said that technology had made instruction “more engaging.” As reported earlier, teachers who participated in the web-enhanced problem-based learning (PBL) model study believed that the use of the Internet in that program motivated students to get their work done. Teachers felt that the students were more actively engaged in their learning (Kim, Grabowski, and Song, 2003). Another theme from this category was that teachers’ jobs had been made easier because of technology as well as opening lines of electronic communication between teachers and parents. One principal elaborated and responded with, “Some of the teachers’ tasks have been made easier like lesson planning and averaging grades. The access to other teachers is nice to build collaboration and have access to other great minds with email capability.”

The principal comments that were categorized as technology having a moderate influence on teachers accounted for 46.3% of the responses. Many of these responses discussed how teachers were using PowerPoint software in their lessons. Others discussed how teachers’ lesson plans were now online as well as gradebook software teachers used to record student grades.

Less than 15% of the principals’ comments were categorized as technology having no influence or a negative influence on teachers. Responses here generally fell into three themes: teachers using computers for personal reasons, teachers intimidated by

technology, and teachers needing staff development. One urban elementary principal stated, “I am finding that the more technology we get, the more resistant teachers become because they do not have enough training.” This is consistent with the earlier study which found that the teachers’ success in integrating new technology strategies depended on how well they related their previous instructional strategies with the newly acquired ones (Kim et al., 2003).

Demographics. When analyzing the background data of the principals and their campuses in regard to research question three (teachers), no interesting patterns emerged.

The second part of the third research question sought to understand principals’ perceptions regarding the extent technology had influenced counselors. Again, each response to the question from the data was categorized as Positive Influence, Moderate Influence, No Influence, or Negative Influence. The second group, counselors, received seven comments from the principals during the survey. All of the principal responses to this part of the question were categorized as either positive influence (28.6%) or moderate influence (71.4%). From these seven comments, only two principals mentioned specific ways technology had influenced counselors: “upload student assessments faster,” and “scheduling maintenance.” The other five comments mentioned counselors together with teachers and students. For example, a suburban high school principal reported, “With counselors and students, it has made a difference.” This urban high school principal stated, “Our school is technologically equipped with everything that students, teachers, counselors, parents, etc need to stay ahead in the modern society.” Because of the very limited responses from the principals concerning technology’s

influence with counselors, no further analysis was possible for this part of the third research question.

The third part of the third research question sought to understand principals' perceptions regarding the extent technology had influenced students. Again, each response to the question from the data was categorized as Positive Influence, Moderate Influence, No Influence, or Negative Influence. The third group, students, received 69 comments from the principals during the survey. Of those comments, all but two principals reported that technology had a moderate or positive influence on students. When analyzing this portion of the research question, 55% of the principals articulated that technology had been a positive influence for students at their campuses. Responding comments that fell into this category included superlatives to describe the effect technology had on students. Many principals reported that technology could be used as a "hook" to get students interested in the curriculum. One suburban elementary school principal reported that technology had "raised integration to a new level and brought excitement to learning that I never saw before in some children."

Another common thread through the principals' comments was how technology had broken down walls for students. One principal described virtual field trips their students had taken while another principal at a rural elementary school discussed how students "living in a rural area aren't exposed to things that other children have an opportunity to experience. Technology creates those opportunities." Other principals discussed how students are able to use technology to track hurricanes, follow possible volcano eruptions, and watch video clips to illustrate difficult learning concepts.

42% of the principals' responses fell into the moderate influence theme.

Principals' comments were placed in this category if the responses discussed various ways technology had impacted student roles, but did not elaborate as to whether the impact was favorable. For example, this urban middle school principal stated, "The students of today are very comfortable with technology and multi-tasking," while another principal commented, "With the information age that we are living in now, it is important for students to access the computers."

Because there were only two comments from the final two themes, no influence and negative influence, an analysis was not performed. The two statements are as follows:

- "For students, not yet."
- "There is an increasing technology gap between economic classes."

Demographics. When analyzing the background data of the principals and their campuses in regard to research question three (students), an interesting finding was discovered. Both principals who described technology's influence on students as negative or no influence were very similar. They were both female principals of urban elementary schools that received an Acceptable rating from TEA and had been a principal for five or six years. But again, since there were only two responses from this category, not much emphasis can be placed with this finding. One other bit of information found from this demographic analysis was that only five high school principals reported during their interview that technology had been a positive or moderate influence on their students.

Technology's Influence on the Role of the Principal

Three themes emerged from the 34 principal responses to this first research question when they reported the positive influences of technology on their roles as principals: communication/email, data analysis, and makes their job easier. There were five responses that did not fall into any of the aforementioned themes. Of the 34 responses, 32.5% of the principals' responses described how electronic communication had been a positive influence on their roles as principals. One suburban elementary principal reported, "Technology has made communication easier and faster. This allows me to communicate better with teachers and parents." This finding was consistent with the existing literature on the subject, particularly with Haughey's work (2006). Haughey found that many principals used email technology to build consensus among staff at a much quicker pace. Principals were able to email questions to staff and get their input much faster than by calling each one individually. Principals reported they could email teachers questions about students and generate solutions in a more timely fashion. In addition, email was a much better solution than using the phone and interrupting classes.

The second most frequent response to emerge from the principals' comments regarding positive influences of technology was the ability to gather data and make informed decisions. 29.5% of the principals' comments reflected this sentiment. "We can actually use the data we are given to help kids," reported a suburban middle school principal. In today's school environment, principals have access to large amounts of data which they must manage accordingly in order to be successful. Learning to utilize this technology in an advantageous way could revolutionize a principal's ability to manage

student records and information processing (Garland, 2009; Hines, Edmonson, and Moore, 2008; Witten & Richardson, 1991). This is incredibly advantageous for student achievement because their academic weaknesses can be identified from collated information, and a remediation plan can be put into place quickly.

The third most frequent response was that technology had made principals' jobs much easier. 23.5% of the principals' comments reflected this opinion. "It makes it easier to do my job and handle the massive amount of paperwork," stated one suburban high school principal. Another principal from a rural elementary school stated simply, "It has made my job much easier."

When analyzing the data from principals who reported that technology had had a negative influence on their roles as principals, more than a third of the principals cited electronic communication. While the number is less than principals who had reported this as a positive influence on their roles, it is still worth mentioning because it was the most reported reason. This finding was consistent with the existing literature on the subject, particularly the work of Hines, Edmonson, and Moore in 2008. They found that principals today are inundated with electronic communication from all sources because it travels directly to the principal, relevant or not. This has caused an increase in amount of time needed at the computer. Many principals in the study reported the need to schedule time at their computer in order to correspond with all of the emails they are sent; often times that includes longer days or taking work home.

The Principal's Perception of the Extent Technology Has Made a Difference in the School

Principals overwhelmingly reported that technology had made a positive impact at their schools. From a total of 491 comments in the entire survey, over 40% of the principals' comments in the survey fell into this category, while only seven principals reported that technology had a negative impact at their schools. Over 75% of the respondents to this question commented on various ways that technology had impacted their schools. Some of the principals' positive responses on how technology had been beneficial to their campus included:

- provided additional resources for everyone to improve practice;
- formed new classes to teach students different technology skills;
- various software programs made principals', teachers', and staffs' jobs easier;
- provided additional online curriculums for struggling students;
- improved efficiency; and
- increased capacity to communicate with parents and students;

These findings are consistent with the literature review and are just a few of the ways technology is impacting campuses today. When analyzing the seven responses of the principals who commented that technology had adversely affected their campuses, two themes were identified: lack of resources and frustration. One of the five principals had this to say: "The district talks about it, but does not support it consistently with all campuses. There is a real disconnect and difference when you consider all schools." An urban high school principal put it simply, "Our school is not properly equipped."

The Principal's Perception of How Technology Has Influenced Teachers, Counselors, and Students

Teachers. When principals reported how technology had been a positive influence on the teacher's role, one main theme emerged from the 32 principal responses: enhanced instruction. 68.7% of the responses mentioned some way that a teacher's delivery of the curriculum had improved because of technology. For example, this urban middle school principal reported, "It has definitely impacted teachers; they organize better, and have more creative lessons and projects." Another principal from a suburban school stated, "Teachers are able to use different teaching methods to reach all students." These are the kinds of benefits that technology can create in 21st century schools, as supported by the literature (Bennett & Gelerter, 2001; Dawson & Rakes, 2003; Trotter, 1997).

When principals discussed the negative influence technology has had on teachers, the majority of the comments were centered on hesitant teachers who needed staff development in order to be proficient with the technological advances. These findings are consistent with the results of Kim, Grabowski, and Song's qualitative study in which they investigated the perception of science teachers who used a web-enhanced problem-based learning (PBL) model (2003). In the beginning, teachers were slow to adopt the new practices they had learned to execute the web-enhanced PBL. Eventually, all teachers adapted and began implementing the new strategies with success. The results from that study implied that the teachers' success in integrating the new strategies

depended on how well they related their previous instructional strategies with the newly acquired ones.

Counselors. As reported previously, counselors received only seven comments from the principals during the survey. This accounts for only 1.4% of all data collected in this survey. Of the seven comments made by the principals during their interviews regarding counselors, only two principals mentioned specific ways technology had influenced counselors: “upload student assessments faster,” and “scheduling maintenance.” The other five comments mentioned counselors together with teachers and students. Because of the very limited responses from the principals concerning technology’s influence with counselors, no further analysis was possible for this part of the third research question.

Students. Again, principals overwhelmingly reported the positive influence technology had had on their students as opposed to the negative influences. 55% of the responses reported ways technology had benefited students on their campuses while only one principal reported it affecting students in a negative manner. From those responses, three main themes emerged: provides additional resources, enhances student learning, and engagement.

Some examples of the way technology has provided students with additional resources that principals reported included research opportunities, virtual field trips, presentations, and distance learning. 31.5% of the principals responded that technology on their campus had enhanced student learning while 28.9% of the principals’ responses indicated that it had enhanced student learning. One suburban high school principal

reported, “It allows for lessons to be more relevant to students and the ability to build background knowledge for students in a more efficient manner.”

These examples are consistent with the power of technology reported previously in the literature review. To begin to fully appreciate the educational opportunities provided by technology, principals must celebrate and encourage these innovative strategies to engage students. Consistent with Garland’s work, one way to transform learning while bringing schools into the 21st century is through the use of technology. This could include new technologies used inside the classroom to help engage student learners in their curriculums (2009).

Implications

Consistent with Brockmeier, Sermon, and Hope (2005), overall, principals’ perceptions of technology’s influence is a positive one. 62.4% of the principals’ comments spoke to what a positive function technology had played in their roles, the school, and for teachers, counselors, and students. The question is how do we, as principals, facilitate that process of integrating technology into more classrooms in hopes of raising student achievement? More than 80% of the principals reported that they could benefit from more professional development in assessing computer technology’s influence on student achievement (Brockmeier, et al., 2005). The authors also found that while a majority of the principals were comfortable using technology to communicate electronically, many cited a need for professional development regarding the use of technology for research, developing budgets, creating databases, and preparing presentations. Of all the responses from the current survey, no principals reported using

technology for developing budgets. An extension of this survey would be to determine the principals' current level of computer expertise and if the principals are prepared to lead their campuses in the integration of computer technology into the teaching and learning process. It would be interesting to study the urban high school principal's campus for technology integration who reported during this study that, "I don't care about technology." In all likelihood, this principal would not be a transformational leader who is more likely to motivate his staff and successfully implement technology at his school in order to raise student achievement.

The examination into principals' perceptions of technology's influence in today's schools has important educational implications for all principals and for those programs that prepare them. It is important for principal preparation programs to understand this challenge and meet the needs of principals when preparing them for a position. If a principal does not know how to use databases to sort through student information, or how to employ time management strategies in dealing with electronic communications, the preparation program has not only failed the principal, but the campus to which he/she will be assigned. As cited earlier in the literature review, the type of technology training a principal receives produces a significant statistical influence of technology integration into the curricula (Dawson and Rakes, 2003). This current study has shown that principals' perceptions of technology's influence are positive and the next thing to be determined is if that influence transferred from the principals to their campuses.

Future Research

During this study, additional areas were found in which future research could potentially add significant insight to our understanding of those aspects that contribute to technology's integration into the curriculum. The following recommendations for research in the area of technology's influence in today's schools are suggested:

1. While this survey collected responses to the question of principals' perceptions of how technology has influenced their roles, an area of interest that should be explored further is precisely how technology is influencing those roles. Some principals reported that while electronic communication had been beneficial to their roles, others reported that it was a negative influence. More detailed data from the principals is needed to make more informed decisions about future practices. Likewise, many principals reported using databases to sort student information, but to what extent is that informing practice? It would be enlightening to survey principals about what technology they use and how often.
2. In addition, many principals reported during this survey that technology enhances instruction. An area of future study would be to survey teachers to find out exactly how they are using technology in the classroom and what benefits they see arising from that use. If a teacher is simply transferring her lecture from the blackboard to a PowerPoint presentation, how has that enhanced instruction? Much more telling would be to find out how often teachers are using technology for students to perform research or enact scenarios such as the one a Northwestern Pennsylvania school district did. The teachers there used the Kids as Airborne

Mission Scientists (KaAMS) web-enhanced PBL program which was developed to get students interested in science as they participated as NASA scientists who explore environmental issues.

3. Does student achievement increase when technology is used in the classroom?

What types of technology are more successful at raising student achievement than others? One principal from a suburban high school reported in this survey that, “Computers are very expensive pencils and pens, and they haven't impacted us the way they were intended to. They are an expensive word processor for kids.” This is not the type of technology integration that is conducive to raising student achievement. Instead of asking principals what their perceptions are of how technology has influenced students; imagine the rich data that could be obtained from asking these questions to students themselves.

Conclusions

Overall, this study advances our understanding of the importance of technology in 21st century schools and the impact it has had on principals, counselors, teachers, and students. The results of this study have expanded the knowledge base regarding the value and use of technology in education as perceived by school principals. The data gathered is extremely timely in light of the accountability of school principals and making sure all students are successful in their mastery of the state's curriculum. Technology can play an integral part of ensuring student success.

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APPENDIX A

HUMAN SUBJECTS IRB APPROVAL LETTER



U N I V E R S I T Y of H O U S T O N

COMMITTEES FOR THE PROTECTION OF HUMAN SUBJECTS

November 4, 2010

Mr. Robert Bell
c/o Dr. Doris Prater
Educational Leadership & Cultural Studies

Dear Mr. Bell:

Based upon your request for exempt status, an administrative review of your research proposal entitled "Principals' Perceptions of Technology's Influence in Today's Schools" was conducted on October 11, 2010.

At that time, your request for exemption under **category 4** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review.* Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,

A handwritten signature in black ink that reads "Enrique Valdez, Jr." with a stylized flourish at the end.

Enrique Valdez, Jr.
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **September 1, 2015**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 11040-EX

APPENDIX B

THE PRINCIPAL SURVEY



University of Houston  College of Education

COLLABORATION FOR LEARNING & LEADING



Graduate Student's Name

Section A:

Demographic Information

The Principal's name

Age in Years: ☐ 30 and Under ☐ 31-37 ☐ 38-45 ☐ 46-55 ☐ 56-62 ☐ Over 63

Sex: ☐ Male ☐ Female

Years as a Principal

Years in Education

Degrees Held: ☐ Bachelors ☐ Masters ☐ Doctorate

Management Certification

Year

Institution

Ethnicity: ☐ White/Non-Hispanic ☐ Black/Non-Hispanic ☐ Hispanic ☐ Asian/Pacific Islander

☐ American Indian/Alaskan Native

☐ Non-Resident/International

Major teaching field

Extra-curricular activities directed while a teacher

The School's name

Location: ☐ Rural ☐ Suburban ☐ Urban The Grades in the school

Number of: Teachers Students

Percentage of students: White/Non-Hispanic Black/Non-Hispanic Hispanic
 Asian/Pacific Islander American Indian/Alaskan Native
 Non-Resident/International

Other certificated personnel Non-certificated personnel

TAKS Rating: ☐ Exemplary ☐ Recognized ☐ Acceptable ☐ Low performing

Percentage of students receiving free and reduced Lunch

Name of School District

Section B:

In this section we are trying to establish how principals conceptualize their notions of what makes a school a "good" school as opposed to a "fair or poor" school.

Much of the current educational leadership literature focuses on effective schools and more currently how we develop our schools as community. The new nomenclature currently used is "good school." How would you describe a good school?

For our purposes school culture is described as "What the school values." How would you describe the culture of a good school?

Section C

We are trying to understand the importance of the relationship between the principal and the teachers.

Explain how the relationship between the principal and the teacher important for the school.

Describe what you think are the most critical feature for a successful working relationship between teacher and principal.

What do you do to create good relations with your teachers?

Do you look out for the personal welfare of your teachers? If so, how do you do it?

Section D

In this section we are trying to establish the attitudes beliefs and values that principals have with regard to teacher supervision.

What is the purpose of teacher supervision?

Do our assessment practices (TTAS, PDAS) really work? Do you believe that the process achieves the intended outcome? What do you believe are the outcomes?

Do you think that the principal is the best person in the school to do supervision? For example is there any value for a principal with no education or experience supervising a French language class.

When supervising teachers do you report on what you observe or do you consider other factors when writing your reports? Explain

Section E

We are trying to establish the understandings that principals have about leadership

Describe the difference between a "linear" leader contrasted to a critical thinker and systematic problem solver?

What do you believe are the most important characteristics of a good leader?

How would you describe yourself as a leader?

To what extent do you allow teachers to take risks to make the school better?

To what extent do you believe that teachers should be involved in leadership roles in your school?

Section F

We are trying to establish the understanding and value principals attach to the role of parental involvement in their student's education.

What do you believe is an appropriate and necessary level of parental involvement in the student's education? Explain.

What do you do to encourage and support parental involvement in their student's education?

When a parent asks you to change their student's teacher how do you react?

Check one category below

<input type="checkbox"/>	I do so willingly
<input type="checkbox"/>	I do so hesitatingly
<input type="checkbox"/>	I do so begrudgingly
<input type="checkbox"/>	I try my best to discourage it
<input type="checkbox"/>	I resist their efforts to have a change

Explain your answer here:

Section G

In this section we are trying to establish the obstacles frustrations and changes principals are most concerned with

On a scale of 1 to 5 with 5 being most and 1 being least, rate the degree to which each of the following presents a feeling of frustration or being discouraged in being able to carry out your duties.

	1	2	3	4	5
Federal Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School District Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of other resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parent involvement in the school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor Preparation of Teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Teacher Commitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor instruction of teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parental involvement at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Student Motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor basic skills of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On a scale of 1 to 5 with 5 being most and 1 being least rate the degree to which each of the following presents a genuine obstacle or restriction that cause you the most concern as you try to carry out your duties as principal.

	1	2	3	4	5
Federal Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School District Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of other resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parent involvement in the school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor Preparation of Teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Teacher Commitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor instruction of teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parental involvement at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Student Motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor basic skills of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On a scale of 1 to 5 with 5 being most and 1 being least rate the following for the things that you would charge to make you more enabled in your role as principal.

	1	2	3	4	5
Federal Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School District Bureaucracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of other resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parent involvement in the school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor Preparation of Teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Teacher Commitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor instruction of teachers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of parental involvement at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of Student Motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor basic skills of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section H

On a scale of 1 to 5 with 5 being most and 1 being least indicate the extent to which each of the following represents important knowledge you should have to be a successful principal.

	1	2	3	4	5
Knowledge of people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fiscal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On a scale of 1 to 5 with 5 being most and 1 being least indicate the extent to which each of the following represents important skills you should have to be a successful principal.

	1	2	3	4	5
Interpersonal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On a scale of 1 to 5 with 5 being most and 1 being least indicate the extent to which each of the following represents important attributes you should have to be a successful principal.

	1	2	3	4	5
Positive disposition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visionary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethical Values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good Communicator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organizer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section I

We are trying to understand the importance of student behavior in the operation of the school

To what degree is student discipline an important aspect of a good school?



Explain



Do you know of teachers who rarely have student discipline problems?

Yes ☐ No ☒

If yes, what is it that those teachers do that results in good student discipline.



Describe what it is that teachers' do that have poor student discipline.



Do you see a relationship between a teachers' classroom discipline and students' academic achievement?



Do you think that schools should teach "virtues" or "character?" Why or why not?
Do you have any formal programs in your school that focus on character education?

Section J

There is probably a lot of advice you could give to someone preparing to become a school principal but if there was one single piece of advice you could give what would advise.

Section K

How has the influence of high-stakes testing influenced your role as a principal?
How is it influenced teachers, parents, and students?

Section L

To what extent is the achievement gap a problem in your school? What efforts have you made to reduce achievement differences in school?

Section M

To what extent has technology make a difference in your school? How has it influenced teachers, counselors, and students? How has it influenced your role as principal?

Section N

Can you think of an example of research-generated knowledge which you found useful in some aspect of your job as principal? If so please tell me about that knowledge.

All educators need access to new expert knowledge. What sources of information do you find most useful when looking for new professional ideas? On a scale of 1 to 10 (highest), how would you rate each of these types of information sources for the technical knowledge they provide:

- a. Professional meetings of state or national education associations

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- b. Workshops

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- c. Professional Journals concerned with education

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- d. Professional Books concerned with education

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- e. Professional Bulletins from regional or national information sources

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- f. Professional Bulletins from district or state authorities

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- g. Newsletters from professional organizations

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

- h. University or college courses that you attended for certification or a advanced degree

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

i. Internet

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

j. Other sources (please explain)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

On a scale of 1 to 10 (highest), how would you rate the quality of the educational research that you've read over the last year?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

What would it take for you to rate it a 10?