TECHNOLOGY LEADERSHIP CAPACITY: A PERCEPTUAL STUDY OF THE RELATIONSHIP BETWEEN SCHOOL ADMINISTRATORS' EXPERIENCES WITH INFORMATION TECHNOLOGY AND THEIR CAPACITY TO SUCCESSFULLY IMPLEMENT THE SCHOOL DISTRICT'S TECHNOLOGY PLAN

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Abstract

District and building level leaders are expected to be part of a team of staff members that lead their school districts in information technology usage and decisions. The leadership role of administrators is critical to the success of technology integration in schools. The purpose of this study was to explore the perspectives of principals and central level leaders with primary responsibility for information technology, to learn about their perceptions of and experiences with information technology, and to understand their perceptions of their leadership capacity to successfully implement the district technology plan. Eighteen administrators were interviewed from nine school districts located in close proximity to the Capital Region in New York State. Findings show that district and building level leaders have a moderate to high level of comfort in using information technology, and many perceive themselves to be leaders of their district or building in information technology. However, although they value professional development in the area of information technology for their staff, the majority of the administrators interviewed were mostly self-taught in information technology. Recommendations for future research include examination of the potential benefits for administrators to obtain professional development in technology through independent study. Further research is also suggested to determine the extent to which the perceptions and comfort levels of administrators in the area of information technology affect their role with the acquisition and dissemination of technology resources, as well as their role in providing professional development opportunities for teachers in their districts and buildings.

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TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

Introduction

In this era of focus on 21st Century skills in education and their connection to the use and integration of information technology in schools across the nation today, the use of technology and technology reform in education is a popular topic. There are entire journals and books dedicated to the subject. Popular educational technology journals include T.H.E Journal, Learning and Leading with Technology, and Tech and Learning. Book titles include The World is Open: How Web Technology is Revolutionizing Education by Curtis J. Bonk, and Empowering Students with Technology, by Alan C. November. Exponential changes in technology are having a great impact on our world. The New York State Technology Planning and Policy Report states that, "Building the technological capacity of the education system in the US is critical to the global leadership of the state of New York and the nation" (University of the State of NY (USNY) Technology Policy and Practices (TPPC), 2007, p. 5).

Internet access in school districts nationwide was at nearly 100% in 2003 (Parsad and Jones, 2003), allowing all children enrolled in school the ability to utilize the internet according to their school district's policy. In February of 2010, the New York State Board of Regents approved a new version of the New York State Technology Plan. This plan recognizes the benefits of technology for teaching and learning and encourages school leaders to embrace the technology standards as well as technology integration into the curriculum so that students may be successful as 21st century learners. In order to comply with the state recommendations, as well as organize and manage their own internal systems, school districts hire various personnel to set-up, run and oversee information technology and millions of dollars are spent in budgets on the acquisition and maintenance of the hardware and software. Furthermore, New York State

school districts must create a District Technology Plan in order to access federal grant funding to keep abreast of all the advances and recommendations in technology as they speed ahead.

District and building level leaders are expected to be part of the team of staff that lead the district in information technology usage and decisions. Research shows that the leadership role of these administrators is critical to the success of technology integration in schools (Anderson and Dexter, 2005; Brockmeier, Sermon and Hope, 2005; Creighton, 2003; Kozlowski, 2006; Miller, 2007). Often the district technology team may include a Director of Technology, a Chief Information Officer, and possibly other technology specialists. However, in smaller school districts, or districts facing budget cuts, central office and building level leaders may be the only administrators in the technology leadership role. In this case, superintendents and building principals may not have expertise in technology but are still in charge of making the important decisions around technology, its purchase and its implementation in the district. They would also be in the leadership role of a district technology committee that would write the district technology plan. It is critical to examine the role that administrators play in the effective usage and implementation of technology in schools in order to enhance student achievement (Kozlowski, 2006; Slowinski, 2003). This research attempts to examine a portion of this issue.

Purpose Statement:

The purpose of this phenomenological qualitative study was to explore the perspectives of two groups of school leaders, principals and central level leaders with the primary responsibility for information technology, to learn about their perceptions of and experiences with information technology, and to determine if those experiences affect their perceptions of their leadership capacity to successfully implement the district technology plan. This study sought to answer the following four research questions:

1. How do the perceptions towards technology of principals and central administrators with responsibility for technology affect the technology implementation process?
2. What is the level of agreement on the success of technology implementation in a district between the central administrators with primary responsibility for technology and building leaders?
3. What is the relationship between the administrators' levels of comfort with technology and their perception of their ability to implement change in technology?
4. What is the relationship between the experiences in technology of the administrators and their perception of their leadership capacity with regards to implementing technology?

Definition of Terms:

District Technology Plan (DTP): The strategies and guidelines a district creates that describe how information technology and telecommunications infrastructure will be used in the district to achieve educational goals and outline curriculum reform. In order to receive grant funding for technology resources, the Federal Communications Commission mandates that a district have an approved DTP to assure the monies' proper use (www.e-ratecentral.com).

Information Technology (IT): Refers to anything related to computer technology, such as networking, hardware, software or the internet (www.techterms.com).

Limitations and Delimitations:

In an effort to delimit the scope of this study, eighteen participants from nine different school districts located in the Capital District of New York state were selected. From each school district there was one central office administrator with the primary responsibility for implementing information technology in their district, and one building level administrator who

implements the district technology plan in his or her building. The superintendents recommended the building principals who participated from their districts. The school districts selected were three urban, three rural and three suburban in close proximity to the Northway corridor due to the researcher's interest in that geographic area. A larger pool of interview participants from a wider geographic range, as well as building level participants not recommended by the superintendent would benefit the research. This would provide more information to the study and perhaps a wider degree of perceptions, experiences and feelings from which the researcher could draw conclusions.

The selection of the sample may have been one limitation in this study. The building level participants and one district level participant were selected by the district superintendents. Although the researcher requested participants that would be willing, but not necessarily strong in technology, superintendents may have suggested participants based on their interest in or knowledge about technology.

The data collected were based on the self-reported perceptions and feelings of administrators and were collected in an interview setting. The researcher assumed that the participants told the truth as they see it. However, it is possible that participants may have given answers that were skewed either positively or negatively based on how they would want to be viewed, rather than how they actually feel. The researcher is an administrator with both building and central office level experience in this same region of NYS. She recognizes that researcher bias was a possibility in conducting this study and therefore worked to minimize it. The interview questions were worded in such a way as to remove potential bias. The researcher asked all the questions in the same way to each interview participant and did not insert any opinion statements to influence the answers. Participants had the opportunity to read the written

version of their answers and make any changes they felt were necessary after each interview. Bias was minimized by selecting three schools from each demographic category and by including schools of different sizes and socioeconomic status.

Summary:

There appears to be a gap in recent literature on the subject area of leadership in information technology in schools. The research that is available includes doctoral dissertations and journal articles that are not completely current, and do not touch on the feelings and perceptions of administrators in information technology. Research that suggests administrators' opinions primarily discuss their view of the lack of professional development opportunities in technology for administrators. The research is clear, however, that technology in education continues to be a major initiative in schools across the country and that administrators and teachers alike must work hard to learn it in order to keep up with the changes both in technology and because of it. It is a factor that is here to stay and will continue to be both a blessing and a challenge for educators.

There appeared to be a gap in the literature discussing the perceptions and feelings of school administrators towards information technology. This study attempted to determine if the perceptions, feelings and overall experiences with information technology affected the school administrator's perceptions of his or her capacity as a leader of technology, and his or her ability to implement the district technology plan. This information will lead to recommendations on improved practice in the field of educational technology reform in the areas of increasing the knowledge, skills and comfort level of school district leaders for the overall benefit of informational technology growth in schools.

Chapter Two

Literature Review

The Role of Educational Leaders with Respect to Information Technology

In 2008, and for the previous 6 years, the US Department of Education commissioned a survey of students across the United States on their use of technology. Some emerging themes from this survey were: students of today are technologically savvy, value technology and depend on it in their everyday lives. They approach their lives and activities differently today due to the use of technology and, as students get older, their use of technology becomes more sophisticated while the youngest of students use technology to an even greater extent than ever before (NetDay, 2009). The first NetDay study in 2003 revealed that 97% of all students surveyed in grades 7-12, 95% of all students surveyed in grades 4-6 and 82% of all students surveyed in grades k-3 believe that technology plays a vital role in their education. Students stated they believe that further access to technology would allow them to learn more, get better grades and produce better in the classroom.

Public schools have made incredible advances in supplying schools with access to information technology equipment. Parsad and Jones (2003) found that nearly 100% of public schools in the United States had access to the internet, up from 35% in 1994. Solmon and Weiderhorn (1999) reported that more than 16% of students' classroom time was spent using computers and the internet and over 80% of students reported using technology frequently in the classroom, computer lab or library media center. With such rapidly changing use and integration of technology in schools, it is imperative that leaders supervise and provide "informed, creative

and ultimately transformative leadership for systemic change" so that public education can fully benefit from technology integration (United States Department of Education, 2004, p. 39).

The leadership role of administrators is vitally important in the success of technology integration in schools today (Anderson and Dexter, 2005; Brockmeier, Sermon and Hope, 2005; Creighton, 2003; Kozlowski, 2006; Miller, 2007). Yet as districts have begun to solve the problem of students and staff simply having access to technology, they are faced with the issues of how to effectively use technology to enhance instruction and student achievement. It is therefore imperative to examine the role administrators play in making this happen (Kozlowski, 2006; Slowinski, 2003). The building principal is the key facilitator of technology integration in the school (Dawson and Rakes, 2003; Holland, 2000, Kozlowski, 2006; Miller, 2007). The philosophies and actions of the school leader determine whether or not the integration of technology in the classroom is successful (Anderson and Dexter, 2005; Creighton 2003; Geer, 2002; MacNeil and Delafield, 1998). Unfortunately, research that explores the understanding and practices of school leaders as technology leaders is limited (Kozlowski, 2006; Miller, 2007, Flanagan and Jacobsen, 2003). Both Miller and Kozlowski used a mixed-methods approach to gathering information from principals in specific regions of Virginia and Pennsylvania. Miller found that principals in her study saw themselves as the key facilitator of technology in their buildings, especially after receiving professional development training in this area. Kozlowski states in her conclusion that a common theme throughout her research is the importance of the building principal as technology leader. Both of their literature reviews reflect the need for further study in the area of technology leadership on the part of principals. A continuing challenge is that the expectations on school leaders as technology leaders have broadened and strengthened over time (Valdez, 2004).

Kozlowski (2006) states that educational leaders must project that technology integration is not about the technology itself, but rather the focus on 21st century skills and student achievement that the change in pedagogy will provide for future generations. Her mixed-methods study consisted of a survey with 94 participants in the southeastern region of Pennsylvania. She then conducted further in-depth interviews with 15 of these participants. The purpose of her study was to explore and describe the connections between the following factors: the current state of schools' technology usage, the methods and strategies used by principals to be technology leaders and using technology as a school reform for pedagogical change. Her research uncovered that schools appear to be doing well with the use of technology in the classroom. However areas for improvement include the necessity for principals to make connections between technology and school reform efforts and student achievement. It was clear that principals who felt the strongest about the themes Kozlowski portrayed in her research survey and interviews were those that used technology on a regular basis in their professional and personal lives. The study suggests that a more in-depth look at perceptual orientations of district level versus building level leadership could help administrators understand how to better provide technology leadership to their teachers.

Anderson and Dexter (2005) utilized the 1998 national survey, Teaching, Learning and Computing, to evaluate and explore leadership in technology and its role in technology in schools in the United States. To date, this is the only national study that investigated leadership and technology. These researchers used the survey to collect data from 1,150 schools with responses from 4,100 teachers, 800 technology coordinators and 867 principals across the country (not a random survey, it was weighted based on their tech usage). They uncovered that technology leadership plays a critical role in technology reform and related outcomes.

Implications from their investigation point to the necessity of school leaders being fully immersed and actively engaged in technology in their schools, including creating policy and communicating through the use of technology. Without active modeling on the part of leadership, their results show that a school's technology efforts may be in vain. Their research also indicates the need for new knowledge, policies and strategies to be acquired by leadership in order to effectively facilitate the usage of classroom technology.

Byrom and Bingham (2001) identify the ultimate factor affecting successful integration of technology in schools as the leadership for this technology that administrators bring. Educational leaders must promote effective practices in order to positively affect student achievement (Byrom and Bingham, 2001). Indeed this is the main function of their profession. It is critical, then, for administrators to understand effective practices in technology so that they can promote the vision needed and build capacity. Without this critical component, any reform will not have longevity (Golden, 2004). Anderson and Dexter (2000) agree, stating that administrators need to play an active role in policy, budget, finance and other organizational mechanisms or else technology programs are going to fail. Based on their research, technology leadership that was intact in a school would strongly affect the quality of education in regards to information technology support.

The world is an increasingly technologically savvy place. Parents and communities want students of the 21st century to be technology-literate in order to keep up with increasing globalization and the demands of the job market. Forward-thinking school leaders will contribute greatly to the field of education, as well as their local and global economies if they can effectively integrate technology into their schools (Slowinski, 2003).

The principalship is a role demanding increased technological competency. Furthermore, principals not only need to understand the importance of technology for management purposes but for instructional purposes as well (MacNeil and Delafield, 1998; Valdez, 2004). While school reform is consistently a popular topic in educational circles, reform will not occur without active leadership by the school principal (MacNeil and Delafield, 1998). This is as true for technology as it is for any other area in education. In promoting this active leadership amongst administration, Hall (2009) suggest tips to incorporate into leaders' planning for technology implementation. Two of these tips are: learn and understand the possibilities, and be clear about your educational philosophy. These tips suggest concurrence with the importance that a distinct vision from a leader in the know will serve a school district well in technology reform.

Miller's (2007) study explored the role of elementary principals as school technology leaders in a large school district in Hampton Roads, Virginia. She also investigated the professional development needs of elementary principals in order to be successful leaders of technology in their schools. Her mixed methods study included administering the Educational Technology for Principals survey to all fifty seven elementary principals in the district as well as conducting in-depth interviews with sixteen elementary principals. She found in her study that principals acknowledge the need to be technology leaders, but lack the professional development to do so. Principals in her interviews suggested that their central administration should make this expectation clear to them, and provide them time such as during monthly principals' meetings or summer council meetings to be trained.

Perrenaud (2007) conducted a survey of 55 small and/or rural district superintendents in Idaho regarding their use of information technology. His research focused on how

superintendents' practice and skills in technology influence their technology implementation. His research concluded that in order for superintendents to lead their districts in technology implementation and reform, they need expertise in the utilization of technology themselves. It is critical for systems leaders to establish a clear vision, create a supportive culture, model, inspire and motivate their staff to successfully make change. He concluded that technology has the power to redefine education if it is used effectively.

Slowinski also suggests strategies for administrators in creating a school-wide vision for technology usage, suggesting it's imperative for sustaining progress and effectiveness. He also suggests that reform be observable and modeled by staff. Schools in Forsyth County, Ga. are a model of this behavior. Leadership in this district has fully embraced technology, and has articulated a vision in which technology is embedded in everything the district does. Rather than an isolated department, technology is fully integrated into their culture, from the leadership of the superintendent and board president down to every department, including transportation and facilities. Though this process took time and demanded resources, the commitment to learn and grow began at the top (Maxwell, 2006).

The leadership of Forsyth County school district was able to make their vision a reality by modeling the behaviors they wanted to see in staff. "Leaders communicate their vision by how they spend their time, what they talk about, what problems they solve first, and what they get excited about. In every act, leaders reinforce the values they hold and the vision they hope to achieve" (NCREL, 1995). Unfortunately, of the approximately 15,000 school districts nationwide, only a few hundred are using technology as successfully as Forsyth County due to its visionary leadership (Maxwell, 2006).

Technology Standards for School Leaders

The International Society for Technology Education is a worldwide membership organization of leaders in educational technology. Its mission is to improve teaching and learning by providing leadership and promoting the effective use of technology in education (ISTE, 2009). In 2002, The International Society for Technology Education published its National Education Technology Standards for Administrators and in response to the continuous evolution of technology, updated these standards again in 2009. These standards outline the goals and objectives of practice for administrators in education today with regards to technology, and implicitly state that educational leaders also need to be technology leaders for our schools. To date, forty nine of the fifty United States, including New York, have adopted, referenced or adapted ISTE's NETS in their documents at the state department level (ISTE, 2009).

The standards detail six main categories. Each category includes a bulleted list of indicators that provide objectives to achieve. The first category is Leadership and Vision. The first indicator states, "Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders" (International Standards for Technology Education, 2009).

If school administrators are going to be successful in technology implementation, they must juggle many proficiencies such as modeling the use of information technology, organizing professional development opportunities, leading the change process around technology reform and maintain his or her personal knowledge base and proficiency in this domain (Coughlin and Lemke, 1999). The leader who takes on this comprehensive implementation of technology is

embarking on large-scale systemic reform (Technology Standards for School Administrators, 2009). Research indicates that given the incredible time constraints on administrators, this appears to be a difficult challenge (Hornbacher, 2007).

Anderson and Dexter's (2005) literature review states that all of the literature on leadership and technology claim that school leaders should oversee the administration of educational technology. The National Education Technology Standards for Administrators (NETS-A, 2009) make a similar statement. They include an expectation of visionary leadership and management in each of the six standards, as in standard 4, "Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources." While a vision for technology-savvy students and well – equipped buildings is promoted, there is much reason to believe that a better understanding of technology on the part of leadership needs to occur in order to create a vision and move it forward. Their findings confirm that leadership in technology is more important than infrastructure for effective usage of technology in schools (Anderson and Dexter, 2005). Kozlowski (2006) agrees, reporting that professional development tied to the Technology Standards for School Administrators is needed for building principals in order to be better technology leaders and integrate technology as an instructional strategy.

Educational Leaders and Their Background in Information Technology

Flanagan and Jacobsen's (2003) professional experiences as researchers and teacher leaders in Canadian schools provide them with the background to opine that the traditional roles, responsibilities and preparation of the school administrator do not prepare him or her for the new competencies needed in order to be a leader in technology and that leadership is multi-

dimensional due to the complexity of schools as organizations. A large portion of school leaders are not comfortable with technology and technology information and practice was not part of their leadership preparation programs (Bennett, 1996; Gibson, 2001; Ritchie, 1996).

Ertmer, Hua, Dong, Khalis, Park and Wang conducted sixteen discussion forums and pre and post discussion surveys to obtain information on technology integration in schools and how administrators view technology leadership. The study was designed to determine changes in eight administrators' knowledge and skills relating to technology integration and leadership after they participated in a professional development course for one semester at a large mid-western university. Prior to this course, many of the administrators agreed that they were unclear about their role as technology leader, as well as the proper integration of technology in the classroom. They were lacking knowledge and skills that reduced their effectiveness in this domain. Some leaders had given no prior thought to their role in technology leadership in their schools, leaving most of it up to the technology coordinator if the district employed one. Most had no specific strategies they could share with teachers on the integration of technology. After taking the course, all eight participants recognized the need to be strong role models in technology.

However, school administrators increasingly find themselves with responsibilities in technology for which they are untrained and unfamiliar. Flanagan and Jacobsen believe (2003) that since few principals have actually utilized computers with children in meaningful ways, they lack the experience of usage and educational vision to be able to guide their staff in this area. Central office administrators find themselves even more removed from this opportunity and experience. This void has increased the difficulty for administrators to make smart decisions in the implementation of technology integration in their schools and districts (Brockmeier et al, 2002).

It is critical that educational leaders are knowledgeable about technology in order to be effective in technology reform and its improvement of student learning. However, many administrators may be uncomfortable providing this leadership, or feel an inadequacy in this domain to be truly effective (NCREL, 1995). Most states, including New York, require administrators to take classes in leadership and management; however there are little requirements for technological competencies (Ritchie, 1996). Of all the organizations overseeing school administration, including State Departments of Education, university and college preparatory programs, communities and boards of education, few if any have put a priority on developing technology skills in administrators (Miller, 2007). Furthermore, there has been little research to determine best practices in the preparation of principals to be competent technology leaders. However, relatively recent programs have been developed that are designed for administrators to gain such background. Private program examples include the Bill and Melinda Gates Foundation and the California School Leadership Academy. Professional organizations include the Institute for the Transfer of Technology Education and the National Association of Elementary School Principals Leadership Academy (Ertmer et al, 2002).

Miller (2007) found that professional development needs were mentioned multiple times throughout her interviews with building principals. These needs ranged from training in staying current on new trends and ideas in technology to how technology is changing the needed skill set for children. In all areas of reform, an understanding of the dynamics of change, plus a commitment to developing and sharing new knowledge is essential to being a "transformational leader" (Fullan, 2001). This is the kind of leadership necessary to create the vision, carry it forward and feel confident in the approach as an administrator.

Perrenaud (2007) found that most of the superintendents that he interviewed considered themselves well-versed in word processing and the internet, and believed they had a good overall general knowledge of technology use. He suggests that superintendents get solid training in Excel for data analysis and presentation purposes, and that boards of education expect potential superintendent candidates in the interview to show how s/he will present data via technology to his or her staff and the board prior to hiring.

Educational Leaders and Their Professional Development in the Area of Information Technology

Byrom and Bingham (2001) state the necessity of professional development to provide various opportunities for administrators to learn technology usage. Their study, which consisted of a 5-year intensive technology implementation plan targeted at resource-poor school districts, concluded that leadership and vision for technology was critical but that change is slow. True technology integration needs to be supported by those with a knowledge base in technology pedagogy in order to create change in teaching practices. This knowledge base can only be created in administrators if they are provided the opportunity of training and practice.

Ertmer, et al. (2002) stated that until recently, the professional development needs of administrators have virtually been ignored with most of the efforts in this arena focusing on teacher needs for classroom technology integration. With all the time, resources, money and effort going into technology, the principal as technology leader has had little to no support. Brockmeier (2002) agrees, stating that administrators have been left to on-the-job training as a solution to honing their skills. It is largely important that administrators know how instruction and curriculum can be improved by technology and also be able to help teachers develop

strategies for utilizing this technology effectively in the classroom. They must be able to create a vision and then turn that into a plan (Schmeltzer, 2001). They cannot aid teachers in instructional practice with regards to technology if they themselves have not been trained (Daniel and Nance, 2002). Although the basic skills of word processing, databases, Power Points, website development and other communication and daily applications need to be an essential focus to keep leaders abreast on their own usage (Holland, 2000), professional development in technology for administrators must be broader-based and include hands-on differentiated instruction and practice (Geer 2002; Schmeltzer, 2001). Research shows that long-term technology training of building principals leads to greater impact on the integration of technology in schools, with a significant difference shown between those leaders who received a focused training on integrating technology into the curriculum rather than just those that just received basic skill training. Therefore, for optimal reform and student benefit, leadership training in technology should focus on guiding teachers in the integration of technology into pedagogy (Dawson and Rakes, 2003)

Miller (2007) states that the growing role of technology in education today will require principals to acquire new leadership strategies. She argues that most principals have not, however, been trained in or understand these competencies or conditions to successfully implement technology in their schools. It is imperative, therefore, to provide this training in order to help school leaders become technology leaders if technology is going to support educational reform the way it promises. Although there are multiple subsets of skills that should be targeted for technology professional development, Miller's (2007) study uncovered the areas of leadership and vision, learning and teaching and productivity and professional practice as the three subsets of greatest need, according the results of her mixed methods study.

Miller (2007) also discusses the lack of professional development as an impediment to school technology integration and reform, revealing the lack of focus on the development of principal as technology leader in most districts and states. Technology change is fast-paced in today's world and principals must learn new knowledge and strategies in order to effectively lead their schools in technology integration. MacNeil and Delafield (1998) conducted a survey in a southeast Texas school district on technology implementation in the classroom and principals' perceptions of technology integration challenges. Sixty four school administrators responded and results indicated that the perceived importance of technology was high, however it was not closely aligned to the little amount of time allotted for professional development in technology integration.

A survey of principals using the Computer Technology Survey was conducted to examine the principals' relationship with computer technology. A key area studied was principals' professional development needs regarding technology. The responses generated showed a clear need for training in the areas of being able to assess technology's influence on student achievement, using technology to collect and assess data, integrating technology into curriculum as well as their work as a principal and using technology as a method to support the facilitation of change (Brockmeier et al, 2005). The research and literature clearly supports the need for administrative training in technology (Miller 2007).

Rudnesky (2006) stresses that principals should never ask their teachers to do something they themselves would not do. If principals tout the importance of professional development in technology to their teachers, then they must also be willing recipients of that professional development. This will convey the importance the leadership places on technology usage by

staff and students and, as Quinn (2002) and Wilmore (2000) suggest, the principal is modeling that he is the head learner of his school.

School leaders cannot know everything there is about technology. However, they should have a working knowledge of the various software and hardware available and how they can effectively enhance and support instruction (Brockmeier, et al., 2005). Some professional development is self-directed, such as the activities suggested by Rudnesky (2006) for technology leaders to pursue in order to continuously stay abreast of the most current information. These activities include reading current literature, visiting other technology-rich schools, talking with other technology-savvy professionals and of course, participating in continuous staff development trainings both in and out of district. This leading by example models to teachers the expectation of their own continued learning, as well as shows staff and students that technology is not a luxury but a strategy for academic success (Ritchie 1996).

Training is also needed in the development of technology plans as well as understanding effective integration models (Ritchie, 1996; Schmeltzer, 2001). Tom Schmeltzer is the founder of Technology Solutions and the TOPONE technology leadership program. He suggests the following important pieces of technology leadership training: formulate a vision for success, review technology best practices, develop a technology plan, apply team building principles in the school, communicate with internal and external audiences, review effective classroom integration models, grow leadership capacity within the school (Miller, 2007).

Ritchie (1996) adds the following suggestions for training: acquiring of additional resources, understand new technologies as they emerge, the availability of software, logistics and security for technology. Geer (2002) also provides the structure of a course created to support

the acquisition of technology skills for administrators, and the utilization of technology for instructional practices as well as the non-instructional needs of managing a school. Some of the course components include: best practices in technology integration, the utilization of spreadsheet software to teach school finance, models of professional development, teacher evaluation of technology usage, creating and using databases, the exploration and use of technology tools, communicating with the school community, the acquisition of basic hardware and network knowledge, ethical and legal issues with technology.

While research points to the necessity of professional development to raise knowledge and awareness regarding IT, one ten-year study also points to internal motivation as an indicator of successful IT usage, in this case in promoting higher-order thinking skills amongst university faculty members. Zhou and Xu (2007) found that this intrinsic motivation was actually more effective than workshops or training. Therefore, it should be cultivated by giving examples of successful usage to impart an understanding of the importance of technology education in learning. The researchers believe that this will help ameliorate the numerous barriers to technology usage by faculty of institutions of higher education, and is relevant to take into consideration by administrators in schools today.

Hornbacher (2007) examined the relationships between the technology competencies of elementary school administrators and the competencies of integrating technology of the teachers they supervise. Using the Professional Competency Continuum profile assessment, he examined the results of the previously surveyed K-6 teachers in North Dakota from the years 1999-2006. This survey was part of the North Dakota Teaching with Technology initiative and measured the technology competencies of teachers and administrators in relation to the national technology standards in five key areas of improving educational technology. There were 1,457 teachers and

226 administrators that participated in the study. Hornbacher's analysis of the data indicated that administrators show signs of confidence in certain technology areas such as leading and managing systemic change, leading professional development and maintaining a knowledge base. He also found, however, that growth in the competencies of technology is a slow and continual process requiring time, money and leadership. He warns against school districts pooling all their financial resources for professional development into math and reading and ignoring technology. He suggests reprioritizing existing funds and increasing locally-generated funds into technology staff development, hardware and software. A sustained technology integration approach will take funding, time and leadership and if we ignore this, we will ultimately be disconnected from the global economy.

Conclusion

Today, technology in schools has the potential to be transformational. It directly supports efforts aimed at closing the achievement gap, increases support for teacher professional development and provides real-time data to inform instruction, among numerous other benefits (Lemke, Sayavong and Martin, 2004). Indeed, technology has the ability to reform education, however to date, this has not been fully realized (Brooks-Young, 2002; Miller, 2007; Perrenaud, 2007). There are a large number of variables that impact this transformation, but research points to support from school leadership as the most important catalyst for change (Gibson, 2001; Ritchie, 1996; Wilmore, 2000). Technology has great potential to be effective in promoting student achievement, and is an excellent tool to help organize, manage, and maintain information and otherwise allow students and professionals to be more efficient and ultimately successful in their lives.

For students and teachers to fully utilize and implement the resources schools have acquired, and for schools to continue to maintain and improve the resources they already have by making technology a priority, leadership has to fully embrace, understand and promote technology and its advancement. Research shows that educational leaders need further professional development training in technology (Brockmeier, et al 2005). However, little research has reviewed the perceptions of administration of technology, and how their perceptions affect the implementation process. Furthermore, there is a gap in the research showing the level of comfort with technology and administrators' ability to successfully implement both the infrastructural as well as curricular components of their district technology plan. Additional research is needed in order for higher level education, state education departments and individual school districts to be able to meet the needs of school administrators both present and future (Miller, 2007).

Perrenaud (2007) suggests that further research be done on leading technology integration as a change initiative in order to better support superintendents as they lead their districts in implementing technology reform. He states that adding to this body of knowledge will enable systems leaders to learn what specific strategies are most effective in leading change in technology.

The purpose of this qualitative study was to explore the perspectives of school leaders to learn about their perceptions of and experiences with information technology, and to see if those perceptions and experiences affect their perceptions of their leadership capacity to successfully implement the district technology plan. In conducting the literature review, there appeared to be a gap in the research regarding how comfort with technology, coupled with the administrator's experience and ability affects their perceptions of their technology leadership capacity with

regards to their ability to implement the district technology plan. This study included nine districts: three rural, three suburban and three urban from the Capital Region of New York State. The interviews included one central office administrator with primary responsibility for technology implementation and one building level administrators in each district. More research in this field is needed because, as Anderson and Dexter (2005) confirm, further research could lead to improved practice in this field.

Chapter Three

Methodology

Purpose of the Study

The purpose of this phenomenological qualitative study is to explore the perspectives of school leaders to learn about their perceptions of and experiences with information technology, and to determine if those experiences affect their perception of their leadership capacity to successfully implement the district technology plan. This study addressed the following four research questions:

- How do the perceptions towards technology of principals and central administrators with primary responsibility for technology affect the technology implementation process?
- What is the level of agreement on the success of technology implementation in a district between the central administration and the building leaders?
- What is the relationship between the administrators' levels of comfort with technology and their perception of their ability to implement change in technology?
- What is the relationship between the experiences in technology of the administrators and their perception of their leadership capacity with regards to implementing technology?

Sample and Participant Selection

Nine districts were purposefully selected based on three criteria: proximity to the Capital Region of New York State, their fit within the demographic categories of rural, suburban and urban, and agreement by the superintendent that district administrators could participate in the study. Superintendents in these districts gave written consent via email for the researcher to interview them or the primary person in the district responsible for information technology implementation, as well as one principal that he or she selected. Participation in this study was

voluntary. Each of the 18 administrators gave informed written consent. There was no remuneration for participation.

Research Design and Procedures

The researcher contacted the superintendent in each district to obtain consent for district participation. In all cases but two, the superintendent was easily reached and consented without hesitation. Out of the other two, one suburban superintendent was not reachable after two weeks of attempts. In the other case, the suburban district superintendent was unwilling to participate. The researcher purposefully selected two new suburban schools along the Northway corridor, to include in the study. These superintendents agreed to participate in the study.

The researcher asked the superintendents to recommend a candidate to interview based on the following criteria: one central office administrator with primary responsibility for information technology implementation and one building level administrator who is responsible for implementing the district's technology plan. In some instances, the superintendent was the central level administrator responsible for information technology implementation and was therefore the one interviewed in that capacity. The researcher sent the cover letter of explanation (Appendix B) to these individuals, and also an informed consent letter (Appendix C) which the participants read and signed in agreement. Once volunteers provided written consent, the researcher interviewed the candidates either in person or by telephone, at a date and time that was mutually convenient.

The researcher asked the scripted questions, which are discussed below, to all candidates and the follow-up questions when more information was needed. The interviewer took notes on the computer during the interviews. The researcher decided upon this method of recording due to its simplicity and efficiency. The researcher also considered this method less inhibiting to the

participants than audio-taping, which could have resulted in creating anxiety for some of the participants, or may have caused some participants to feel they could speak less freely. The information recorded from these interviews was shared with each participant immediately following each interview, as well as after transcription to ensure accuracy on the part of the researcher and improve validity.

District technology plans from the districts were reviewed. These documents allowed the researcher to gain an understanding of district goals and objectives with regard to information technology and support in data analysis and triangulation of data for verification purposes.

The Sage Colleges' Institutional Review Board judged this process to be a "minimal risk" study, and every effort to respect the rights, needs and privacy of each participant was made. It was understood that personal and/or sensitive information may have been shared during the course of an interview. Therefore, the responses were and continue to be held in strict confidence. The responses, however, were not anonymous. To protect every district and individual, each research school district and participant was given a pseudonym. No real names were used when collecting or reporting the data. The data were stored on a password protected computer and all data were destroyed after the doctoral research study was completed.
The interviewer followed-up with each participant individually with a personalized thank-you note to express her appreciation for their time and effort during this research project.

Data Collection Strategies

Data collection commenced January 4th, 2010 and continued through March 31st, 2010. The researcher was the key instrument in data collection via interviews. The interviews included eighteen candidates as specified. Every interview followed open-ended, scripted questions with scripted follow-up questions and took approximately 30 minutes to complete. The candidates

were given full choice of time and date to schedule the interview and the interviewer worked that into her schedule. In some cases the interview took place in the natural setting, which was the office of the administrator. In other cases where traveling was less convenient to either the participant or the researcher, the interview took place over the telephone. In either case, the researcher typed the responses of the participant on a computer and saved the interview on a thumb drive.

The data were shared with the participants upon completion of the interview to be sure that the information was accurately recorded and the intended message conveyed. In addition, each participant was asked to review the transcribed notes for accuracy to establish data reliability. Notes were hand-recorded, rather than audio-taped. This provided for a more relaxed environment during the interview as audio-taping had the potential for creating discomfort amongst the participants. However, without audio-taping, conversations were not able to be replayed for clarity or to ensure all spoken information was captured. Furthermore, voice inflection could not be used to help discern meaning.

A copy of the districts' technology plans were requested from each of the consenting districts. In cases where the district technology plan was available on the district website, this document was retrieved from the website and the participants were informed.

Qualitative research is an emergent design, therefore the researcher must be flexible and willing to make changes and adjustments to the different phases in the process once data collection ensues. In order to fully learn about the problem, these changes may be necessary to address and obtain the critical information (Creswell, 2009). The research phase was flexible and adjustments to the design were made on an as-needed basis. For example, it became evident

throughout the interview process when to ask the follow-up questions, and when the questions were not needed as sufficient information was given by the candidate.

Data Analysis

The data were analyzed throughout the interview process and data collection phase. Data were organized by demographic area, then district, then participant, using pseudonyms for the districts and participants. Data were read thoroughly and coded in categories that emerged from the answers given by the participants. The researcher sought to code the data into as many categories as emerged from the responses. Such themes included professional development, challenges in implementing information technology, and personal leadership capacity in technology. Emerging patterns and themes were identified, categorized and relationships between emergent themes were noted. The meaning of these themes and descriptions were then interpreted. The information obtained from the districts' technology plans were quoted verbatim and used to compare to the answers given by the participants in the analysis. Responses between central office administrators and building level administrators within the same district were compared and contrasted in order to determine levels of agreement between these administrative positions (Creswell, 2009).

Verification

To ensure internal validity, several techniques were used. The first was triangulation of data. Data were collected through interviews and district technology plans. When administrators mentioned information regarding their district technology plan, its accuracy was verified by accessing the document. The interview questions were practiced on administrators who were not part of the sample in the same categories prior to interviewing any research participants in order to determine if the questions were appropriate, clear and without bias.

Written responses were shared with the participants at the conclusion of each interview to ensure the participants' meanings were what were recorded, rather than the researcher's meaning or meaning from any literature the researcher has read. Furthermore, this member-checking allowed the interview candidate to agree with the accuracy of what was written, to establish data reliability. In writing the description, the researcher used descriptive and detailed rich narratives, and include verbatim quotes where such enhanced understanding of the emergent themes. Both positive and negative data, including data that was discrepant to the themes were presented, and participants were interviewed in their natural setting whenever possible.

Researcher experience and perception of technology shapes the interpretation of the data collection and analysis. The researcher is a white, middle class female with opportunities to access information technology as it became available to the marketplace, school and workplace both past and present. The researcher's own challenges, perceptions and experiences played a role in both interest in the subject area being studied, as well as the data interpretation. Reflection on this bias occurred throughout data collection and analysis.

Reporting the Findings

A holistic, interpretive narrative was used to describe the findings in this qualitative study. Categories emerged and results were described in detail, utilizing charts and graphs as appropriate and where they may benefit the reader in understanding the data presented. Rich description of the findings of the multiple perceptions and experiences are shared, as well as the conclusions drawn from the research process and data analysis. Recommendations are made in the conclusion.

Chapter Four

Data Analysis

Eighteen administrators responded to the interview questions, supplying the data for the four overarching research questions. Research Question 1 asks: How do perceptions of the central office administrators and principals towards information technology affect the technology implementation process? The data suggest that overall the perceptions of information technology by administrators are mostly positive to extremely positive, and that this positive perception benefits the application of information technology in their school districts.

Out of eighteen interviews, six administrators, in answer to interview Question 1, described their perceptions and feelings towards information technology as they pertain to their leadership capacity in implementing the district technology plan as positive with reservations (Table 1). Twelve administrators did not describe any reservations in answer to the same question. The six with reservations had various concerns (Table 2).

Table 1

Participants' Feelings towards Information Technology

18 out of 18 participants had positive feelings towards technology
12 out of 18 expressed no reservations regarding their perceptions and feelings towards IT as it pertains to their leadership in implementing the district technology plan
6 out of 18 participants expressed positive perceptions with some reservations

Table 2

Participants' Positive Feelings with Reservations towards Information Technology

1 Out of 6 are concerned about how technology is being used by students, such as plagiarism, cyber-bullying, access to harmful websites
2 Out of 6 concerned about the productive use of technology by staff and students rather than just being a distraction or tool for entertainment
2 Out of 6 concerned about the speed of change and the challenges of keeping up
1 Out of 6 concerned about the overwhelming amount of information available around IT
1 Out of 6 are concerned about security and possible hacking issues
1 Out of 6 concerned about how much time is spent by administrators monitoring student and staff technology usage

As superintendent from rural District H explained,

> "There is a whole different level of supervision and administration with students and issues today that was unheard of ten years ago. {Because of technology} we now have to worry about online plagiarism, bullying, threatening and being in sites and activities which are not a positive influence in their lives. A significant portion of our administrative time is spent monitoring how the technology is being utilized. Kids have the ability to multi-task today and go in a thousand different directions, but are they really just multi-distracting?"

This sentiment of needed caution was voiced by most of the administrators at some point during their interview. Other reservations expressed to this same question include that there are

those in the know, including students, who can hack, corrupt or transform the benefits of technology into a bad situation. Suburban superintendent from District F reminds us of the recent disaster in Duanesburg, NY where $3 million dollars was stolen from the district through the misuse of technology by someone with a great deal of skill. Suburban principal from District D cautions that, "Students know more than the adults do." They both believe this vast knowledge base can be dangerous.

Central office administrator from urban District A clearly describes a common dilemma stated during interviews that concerned other administrators as it pertains to their leadership capacity. He rated himself a five with his own comfort level, but stated, "Technology and information is changing so quickly that the end user either doesn't have the skill set to be able to use it appropriately, or to know how to apply it once they get the information. We are just so overwhelmed with the amount of information there is." These examples of challenges are the weighing thoughts that hamper the purely positive outlook towards information technology and the administrators' self-reported perceptions of their leadership capacity in implementing the district technology plan.

Eighteen out of eighteen administrators interviewed had positive perceptions and feelings towards information technology (Table 1). All eighteen also stated that these positive feelings were helpful in their implementation of technology in their districts and school buildings. The most widely discussed positive attribute of information technology was its ability to transform education and the way we teach into a highly effective and exciting method of learning for students. "It doesn't drive anything we do, but it supports everything we do. It is designed to help us be better teachers and learners" states an urban superintendent. A rural superintendent agrees, "We are acknowledging the proficiency that children already have with technology and

using it to teach them by reaching out to an area they can already identify with. The GoNo cell phone use in the classroom is an example." Fifteen out of eighteen stated without prompt that they use technology hardware resources such as SmartBoards, video conferencing equipment and Elmos to enhance instruction as an example of the positive ways technology has influenced teaching and learning.

Positive feelings have led to the support of technology funding in the budget, and the embracement of information technology and its benefits by their staff and the community. One middle school principal states, "I have very positive feelings. I have to model, that is critical. I seek out the high flyers in technology. I identify the teacher leaders and use them as a resource for their colleagues, as in professional development." An urban superintendent shares his board support, "The board absolutely supports the growth of information technology in our district. It is part of our district strategic plan, our capital improvement project and budget. Technology is in each building and the community has made that commitment."

Fifteen out of eighteen administrators interviewed stated they were in some capacity a leader or role model of technology in their building or district. Most followed this statement with the acknowledgement that this leadership positively affects the technology implementation process in their schools. "I like it and am excited about it. I'd like to think I can see the future of where we need to be and do a decent job of assessing where we are" comments an urban middle school principal. A suburban superintendent explains, "I am absolutely a leader in information technology in this district. I provide the vision of where I want the district and community to be. I work with my technology team relentlessly on this."

All eighteen superintendents and principals are cognizant of the benefits of technology use in schools and mention this awareness at various points throughout their interviews. This cognizance increases their interest in implementing technology in schools.

"I am certainly well aware of the importance of all our students leaving our district with a willingness to use technology not only in their work down the road but in their everyday lives," states Superintendent from rural District H. "It opens up new horizons for our young people. It is the way of the world." He adds that rural students may not otherwise have the educational experiences they can have now without it.

Research question 2 asks: What is the level of agreement on the success of technology implementation in a district between the central administration and building leaders?

The level of agreement on the success of information technology implementation within a district varies between the districts (Table 3), as well as between demographic areas. Four out of nine districts interviewed differed by one or more level in their rating on the success of the district in implementing the district technology plan. Of these four, the district level leader rated the district success higher than the building principal twice and both of these were urban districts. One suburban and one rural district superintendent rated it lower than did their building level leader.

Table 3

The Levels of Agreement of Successful Implementation of IT and the DTP between District Level and Building Level Administrators

	Successful	Somewhat Successful	Not Successful
District A			
CIO	X		
Principal		X	
District B			
Superintendent	X		
Principal			X
District C			
Superintendent		X	
Principal		X	
District D			
Superintendent		X	
Principal	X		
District E			
Superintendent	X		
Principal	X		
District F			
Superintendent	X		
Principal	X		
District G			
Superintendent	X		
Principal	X		
District H			
Superintendent	X		
Principal	X		
District I			
Superintendent		X	
Principal	X		

There are some administrators who feel their districts have been less than fully successful, in contradiction to the other leader in their district. For example, in urban district A, the CIO rates his district as successful and states, "We've moved in the last three years making leaps and bounds in the area of addressing the technology plan. People in the state and our region are saying we are far ahead. We are moving fast and furiously with technology." However the building principal in that district states, "Overall I think the district has been somewhat successful. The weak link is the teachers' comfort level and how to integrate technology into the curriculum." These leaders were one rating away from each other on the scale.

Likewise, in urban district B, the superintendent is confident in the district's success. "We are very successful here. We have been very proactive." However, the building principal from district B states that overall the success has been slow in coming. "We often use technology that is very outdated." These two leaders were on opposite sides of the rating scale, seeing the district success in the implementation of technology and the district technology plan very differently. This is the only district to disagree so strongly.

In rural district I, the superintendent felt that the district is moderately successful. "We are getting there," he states, "We are well equipped in terms of hardware, but the transition we need to make is having teachers using more of what is available to them." However the high school principal feels the district is highly successful. "We are right at the top. We have a strategic plan in place and are trying to provide students with the opportunities to utilize these skills. We worked hard to put a SmartBoard in every classroom."

This difference of opinion in the success is evident in district D as well. The superintendent states that their success is a progression. "We are constantly moving forward with it and I am pleased with the direction. I wish that we had more resources in terms of time and money." The building principal says that he feels the district is successful in implementing the technology plan. He recognizes that some staff members have differing levels of comfort in implementing technology in the classroom, however he states that the district provides differentiated professional development opportunities to support their needs. Speaking about the plan, he states, "We are creating a great product and the committee is excited to share the resources with others. Teachers will be able to use the document as they write and develop lesson plans."

Five out of nine districts' administrators are in agreement on the level of success of the district's implementation of information technology and the district technology plan. Of the five, four districts rate themselves as successful and one district agreed they are somewhat successful. Of those that agree, no administrators rated their district as not successful. Demographically, one district in agreement was urban, two were suburban and two were rural. Suburban superintendent in district E states that his district is very successful but feels they still have a long way to go. "We are just scratching the surface, but the district has also moved forward in leaps and bounds over the last several years." His building principal agrees. "We are making gains towards 21st Century skills constantly." This positive outlook is shared between them and discussed often in this district.

In rural district G, the superintendent feels they have been successful as well. "We have done a very good job in implementing information technology. As we build capacity, we are becoming more capable and students are getting more (technology) classes. Over time, our

technology plan has become more student-centered and instructionally focused." The elementary principal agrees. "The district has been quite successful. We have a buzz about technology. I think we are successful because technology is in the forefront, and we have the support structure."

Research question three asks: What is the relationship between the administrators' levels of comfort with technology and their perception of their ability to implement change in technology?

Through various questions in the interview, administrators describe what they feel is the relationship between their level of comfort with technology and their ability to implement change in technology as well as their district's technology plan. The participants were asked to rate their comfort level with using information technology on a five point scale, where five represented "highly comfortable", three was "moderately comfortable" and one represented "uncomfortable". Out of the eighteen participants, no administrators said they were uncomfortable with information technology, rating themselves a one or a two. All eighteen rated themselves between a three and a five. Two participants rated themselves a three, signifying they were moderately comfortable. Eleven participants rated themselves a four and five rated themselves a five (Table 4).

Table 4

Technology Comfort Level Self-Rating of Administrators on a Five Point Scale

	5 Highly Comfortable	4	3 Moderately Comfortable	2	1 Uncomfortable
Urban District A					
CIO	X				
Principal		X			
Urban District B					
Superintendent		X			
Principal		X			
Urban District C					
Superintendent		X			
Principal		X			
Suburban District D					
Superintendent		X			
Principal		X			
Suburban District E					
Superintendent			X		
Principal		X			
Suburban District F					
Superintendent			X		
Principal		X			
Rural District G					
Superintendent	X				
Principal	X				
Rural District H					
Superintendent	X				
Principal	X				
Rural District I					
Superintendent		X			
Principal		X			

Description of Self-Ratings

Out of these numbers of self-evaluation, the two ratings of three were by district level administrators in suburban districts. Three district level administrators rated themselves a five and four rated themselves a four. There were no building level leaders that rated themselves a

three. Seven chose four and two principals from rural districts chose five. Demographically, the rural district administrators rated themselves higher than the urban and suburban as a group, with four of the six participants rating themselves a five and the other two self-rated as four (Table 5). Although the differences aren't remarkable (and can't be compared statistically), comparatively the urban districts had five out of six self-ratings at four and one as a five. The suburban districts were the lowest self-rating for comfort level with two at level three, and four at level four.

Translating Self-Ratings to Practice

The general consensus among these leaders was that in part, due to their level of comfort from moderate to high, they were at some level able to positively effect change in their schools and districts as leaders in information technology and implement the district technology plan. "I would say my level of comfort is at 95% and in following the district technology plan. I see the value in the information and technology and how it can make substantial changes in the way we teach kids and work with staff. I am very positive about it," described an urban district level leader who rated himself at five. The building principal from this same district stated,

"I live and breathe through mine (information technology) every day. ." This principal rated herself a four and discussed how she models it to her staff through programs such as Excel. She stated that the district's focus is in getting teachers to access technology more in everyday teaching for their students. Her ability to model its use shows her comfort and her initiative to implement the district technology plan.

District level leader from urban District B agreed. He rated himself a four and stated he feels very positive about information technology. "As a leader, it is important for me to model. It is part of my job to push people to using technology because it is what we do in the world today." He feels that this has helped his district become very successful in implementing the

district technology plan. "We talk about our plan constantly. You will find we are as updated as any district in the country."

Building leader from District B, however, does not agree that the district is doing a solid job in implementing the district technology plan (Table 2). Though she rated her own comfort level a four and said she has a "strong awareness of hardware, programs and equipment throughout the district," she feels that the implementation of information technology and the district technology plan has been slow and that in her school they are using hardware that is very outdated. She stated that she is not seeing district monies purchasing new equipment but rather is using building level budget dollars or grant funding to buy hardware and software. "We are a SINI school and that allows us to purchase technology."

A Demographic Observation

Table 5

Level of Comfort of Administrators by Demographic Area

	5 Highly Comfortable	4	3 Moderately Comfortable	2	1 Uncomfortable
Urban	1	5			
Suburban	0	4	2		
Rural	4	2			

Administrators from suburban districts generally feel moderately comfortable to comfortable with information technology, and moderately successful in implementing information technology and the district technology plan. District D district level leader stated, "I feel very positive about technology. The implementation of the plan is a progression, however. We are constantly moving forward and I am pleased with the direction. I try to model; I blog and we are in the community with a webcast." He stated, as many others do, that often

what holds districts back in terms of progress is not their attitude, feelings or ability to utilize technology but rather other resources such as time and money. "We have been in a frugal fiscal environment and that has tempered some of the advances. We have items on our wish list."

The building level leader from district D rated himself a 4. He feels that the district is successful in implementing their technology plan. "Our district does a really nice job of training staff and giving them information that they need. I am comfortable with technology and if I can bring a positive attitude towards a topic it spreads." Building principal from suburban district E rated himself a 4 as well. He feels his district is doing very well in implementing the technology plan. "I have very positive feelings towards information technology. When we look at area districts, this is our bragging point, it is technology. Our technology plan is about promoting 21st century skills and we are making gains towards this constantly. All of the ten-year plan dreams have come true."

District F district level leader rated himself a three in his comfort with information technology. He stated he is very supportive of the plan, however, and is very proud of what they have accomplished. "We have VOIP (Voice Over Internet Protocol), I can see what is going on in every school. We have done a wonderful job replacing outdated equipment. We are getting there." He agrees with District level leader D, however, in the areas that hold districts back. In order to increase the success of district implementation of the technology plan, there are many areas that could be improved, such as professional development enhancements and connecting in a meaningful way with technologically advanced communities locally such as the Malta AMD (Advanced Micro Devices) project and Nanotech University at SUNY Albany.

Building level leader F rated herself a four. She sees herself as a facilitator of technology. She feels very positive about it, "I don't know what we would do without it. I think

we as a district have done very well. I think we are right out there, we are leaders." She said of the district technology plan, "We have a framework that the district has worked on and we access it regularly. We have a vision. We can see the big picture and how it all fits together." She too agrees, however, that there is always more money and more training that could be utilized to increase her comfort level and that of staff. However, districts are visiting District F in order to see first-hand how to implement technology in the classroom well.

Rural Schools' Perspective

Both the building leader and the district level leader in rural district G rated themselves as five in their comfort level with technology. The superintendent stated he has mostly positive feelings, and that this position absolutely helps him to implement the district technology plan. "What I have tried to do is implement technology appropriately. The technology plan shares my vision of development over time. By modeling use, I attempt to show leadership in the district." He feels the district has been very successful in implementing the technology plan. Over time they are becoming more capable of building capacity and getting the technology to students. His goals are to stay the course and continue doing what they are doing, including increasing teacher training, in order to fulfill the goals of the plan.

The elementary principal feels very positive about the district technology plan. "The support that we have around it is what allows us to be successful." He feels his positive attitude towards information technology is helpful in his ability to implement the technology plan. "If you don't know it, it is hard to lead it," he states, mentioning his advocacy of being a role model in using technology. Building principal in District I rated himself a four and has similar positive feelings about his part in implementing the district technology plan. "I like to promote

technology usage in classrooms as much as I can. I feel very strongly about providing the resources. I think we are right at the top in the district's success."

Age and Longevity with Regards to Experience

The two suburban administrators that rated themselves a 3 are in late-career in the field of education, since before the use of technology became a priority. Superintendent from suburban district E remembers the transition, "When technology came to school districts I was excited about bringing it in but it was very cumbersome compared to today." He also admits, "I have not had formal training. I am not very sophisticated with the use of technology." Superintendent from district F states he has more to learn but believes that lack of time is an issue that impedes his acquisition of skill in IT, "I acknowledge that my need is much greater than my time permits. I have been exposed to many different types of technology but my biggest issue is having the time needed to become proficient in its application."

Some of the more technologically well-versed administrators were also younger and have been in the field of education for fewer years. As superintendent from district G shares, "I have been a technology enthusiast as a teacher and now an administrator. I have developed curriculum with the internet in the classroom. I was part of the original development of the district technology plan 10 years ago." The building principal from the same district rated himself a 5 and has also used technology throughout his career. "I am a techie at heart. I am of the generation that grew up with technology in school."

Administrators in this research study have a moderate to high degree of comfort with information technology. Their level of comfort, coupled with their interest in information technology and their ability to recognize its power to transform education as a support tool

allows these leaders to see themselves in either a supporting or leadership role in the implementation of change in technology in their schools and districts. They are using technology on many fronts, such as a tool for communication, data analysis, as well as increasing teacher and student interest. Although there is room for growth in many of these leaders' levels of comfort, the majority are making strides to increase both their comfort level through usage and self-teaching, and their leadership capacity in technology.

Research question four asks: What is the relationship between the experiences in technology of the administrators and their perception of their leadership capacity with regards to implementing technology? This relationship is similar in scope. Overall, administrators who had more experience, and therefore usually more comfort with information technology felt that they were stronger leaders in this realm. Administrators with less experience, and therefore usually less comfort with information technology often differed to others as technology leaders in the district. However, most administrators recognized they played a leadership role to a large capacity, and even some with less comfort considered themselves a leader because they are advocates for the use of information technology in their buildings or district.

Out of the eighteen administrators interviewed, five rated themselves a 5 on the scale of comfort. Three of these five were district level, two were building level administrators. These came from the demographic groups of urban and rural, four of the five being rural. There were no suburban administrators that rated themselves a 5. Eleven administrators rated themselves a 4 on the scale. Four of the eleven were district level, seven were building level administrators. These represented all three demographic areas, but most strongly in the urban and suburban areas with five out of six urban administrators and four out of six suburban administrators in this category. Two participants rated themselves a 3 out of 5 on the scale, being moderately

comfortable. They were both superintendents of suburban school districts. There was no one that rated themselves a 1 or 2 out of 5 on the scale. Therefore, all administrators interviewed had a medium to high level of comfort with their use of information technology.

District level administrator for Urban district A rated himself a 5 on the comfort scale. He is also very well versed in technology, and describes himself as having a vast amount of experience in information technology. "My whole job and job-related activities revolve around information technology, in gathering reporting and using technology as the tool to convey the information to the state, the end user or the administration." He feels that his positive feelings about information technology help his leadership capacity in this area and he sees himself as a leader in his district in information technology. He said of his leadership, "I talk information technology all the time from a variety of viewpoints. I see the value in it and how it can make substantial changes in the way we teach kids and work with staff."

Superintendent in rural district G also rated himself a level 5 for comfort. He said, "I am extremely comfortable. I have been a technology enthusiast for years as a teacher and an administrator. I am very comfortable with the district technology plan. I was part of its original development over ten years ago." He believes his positive feelings towards information technology help his ability to be a technology leader in his district. He sees himself as the person with the main role for implementing the district technology plan, although he recognizes it is a shared responsibility amongst many for it to come to fruition. He realizes that he has leadership capacity as the superintendent in implementing information technology in the district, however, he currently works through the principals now.

Superintendent from urban district B explained that he is very comfortable with information technology as a tool but that he works hard to keep up with all its changes. He rates himself a 4 on the comfort scale, and feels very fortunate to be able to rely on the help of his technology staff in the district. "We have a Chief Technology Coordinator who advises me on the technology plan and makes sure it is coordinated with the curriculum." He has very positive feelings about information technology and recognizes that this attitude is helpful in his leadership capacity with information technology. He said of this question, "It supports everything we do but it encourages me as a leader to be able to synthesize what I do." He admitted he learns a lot from administrators who are younger than he is and when asked if he saw himself as a technology leader in the district responded, "I think that is a stretch. I am not afraid and I am comfortable but I am very fortunate to have people that know a lot more about it than I do."

Suburban principal D rated himself a 4 out of 5 on the comfort scale. He stated that he is comfortable with technology, and that he helped create the technology plan for his district as a committee member. Principal D has very positive feelings about information technology and stated that when he brings a positive attitude about a topic to the building it spreads. He said of his role as leader of information technology in his building, "I see myself as a leader and leaders can take on many roles. I show value in technology by attending staff trainings and allowing them to happen on district time. I am open to technology." He recognizes his limitations in technology but does not let them interfere with his leadership capacity. "I might not be the one to take apart the computer and put it back together again, but we all have different areas of strength and expertise. Everyone can contribute."

Suburban superintendent E rated himself a 3 out of 5 for comfort. He stated that he is not very sophisticated with the use of information technology and most of what he knows was learned on the job rather through formal training. He listed several ways he utilizes information technology on a daily basis, including internet, email, Excel and Power Point. He feels he has a very positive attitude about the use of technology in schools and has felt this way since the beginning. Although he takes the primary responsibility for being the administrator in charge of implementing the district technology plan, he places a large amount of the responsibility for its success on the Director of Technology for the district. Of the plan he said, "it is a shared responsibility amongst many" including the assistant superintendent and building principals as well. "My role is supportive," he said. He sees himself as a leader for his district in information technology, "It is a priority for me in helping to prepare students for 21st Century learning skills. The future of education is going to change and technology is going to be part of that change."

Suburban superintendent F also rated his comfort level a 3. "I describe my comfort level as cautious, strategic and concerned," he said. "Professionally I use technology as a tool for communication with graded apprehension and in some cases, reluctance." He is concerned with misuse of technology by both students and staff alike, which decreases his comfort level personally. "I continue to find repeat situations where school district operations have been or could have been compromised." His feelings towards information technology include the belief that it can be used in a positive fashion for leadership and management and said he does, however, have a positive attitude towards technology overall. He sees himself as an information technology leader in his district, "I am not proficient, but I can drive the train. I am the conductor." He stated that it is his job to provide the financial resources and to promote 21st Century skills.

Regardless of their comfort level rating, these leaders and the others interviewed understand the value of information technology, and the role they play in its successful implementation in each of their districts. Many of the administrators are on the forefront of the mission for a strong district technology plan and understand what it takes to bring their district forward in 21st century skills as they relate to information technology implementation. Others recognize that they may not have the set of skills necessary in information technology to make all the decisions, however they have teams of support staff in place to help and still value greatly information technology and the role it plays in education today. All the administrators interviewed stated in some manner that they realized their leadership capacity in information technology was important to the success in this area for their school building or district.

Chapter V

Analysis and Conclusions

Information technology plays an integral part in education in schools today and the role of the school administrator is hugely important to the successful implementation and use of this technology. This research was conducted during a time of technological boom, where the use of technology in the classroom has become the usual practice for many teachers. Districts clamor to secure funding, both local and federal, to purchase software and hardware to improve and update their current technology program and students are progressing with their usage and knowledge of information technology in an unprecedented way that often far exceeds the adults that teach them. The purpose of this study was to explore the perspectives of school leaders to learn about their perceptions of and experiences with information technology, and to determine if those experiences affect their perceptions of their leadership capacity to successfully implement the district technology plan.

The research sought to answer the following research questions:

1) How do the perceptions towards technology of principals and the central administrators with primary responsibility for technology affect the technology implementation process?

2) What is the level of agreement on the success of technology implementation in a district between the central administrators and building leaders?

3) What is the relationship between the administrators' levels of comfort with technology and their perception of their ability to implement change in technology?

4) What is the relationship between the experiences in technology of the administrators and their perception of their leadership capacity with regards to implementing technology?

This study had eighteen participants from nine school districts located in the Capital Region area of New York State. This was a phenomenological qualitative study in which the administrators agreed to participate in interviews either in person or on the telephone.

The primary findings for this research is that district and building level administrators have varying degrees of comfort with their knowledge and usage of information technology, and their comfort level and perceptions of information technology affects their perceptions of their leadership capacity to implement the district technology plan. The findings also suggest that while the administrators interviewed all rated themselves moderately comfortable to highly comfortable in the usage of information technology, some administrators' responses suggested that they may not have as much of a knowledge base around technology as they believed. The principals interviewed were chosen by the superintendents of each district. Through the interviews it appeared that these principals were interested in technology and were chosen on this basis. Due to this, the responses may be more optimistic and forward-thinking than if the participants were randomly chosen, or if less technology focused principals were interviewed.

Research Question 1: How do perceptions affect the technology implementation process?

The perceptions of central administrators primarily responsible for information technology and principals towards information technology affect their leadership capacity in technology. Hall (2009) suggests that administrators be clear about their educational philosophies and create a distinct vision in order to create technological reform in a school district. Perrenaud (2007) agrees, stating a supportive culture around technology must be created

by systems leaders. Leaders whose perceptions towards technology are positive will have an easier time being a visionary, promoting a clear philosophy and creating a supportive culture. This research showed that administrators with more experience and education regarding information technology tended to have a higher comfort level and more positive perception about technology and their leadership capacity. In this research, all eighteen administrators interviewed described their perceptions as mostly positive to fully positive. All eighteen regarded themselves in some way as a leader for technology in their districts although some with a lesser knowledge base admitted that the leadership role was shared with others that had more knowledge than they did. Even in these cases, however, the perception was positive. All leaders interviewed agreed that a positive outlook towards information technology was helpful to their ability to implement technology in their district.

Research Question 2: What is the level of agreement between building and district leaders on the success of technology implementation in the district?

The level of agreement on the success of technology implementation in a district between the central administrators who were primarily responsible for information technology and building leaders varied between the districts. Five out of nine districts' administrators agreed on the level of success, four disagreed. Of the four, only one district had the superintendent rate the level as very successful while the principal rated the level as not successful. The other three districts were one level away in agreement; two districts' building principals rated higher than their superintendents and one rated lower. For example, in District I, the high school principal rated the district as Highly Successful and the superintendent gave it a rating of Somewhat Successful. The principals in the districts in which the administrators did not have agreement often stated in their interviews that there is not a widely shared vision regarding IT in their

district, nor do stakeholders know or understand what the district's goals for technology are in the future.

The problem is discussed in the research, which suggests that most districts have not established a clear and widely-shared vision regarding information technology. Due to this lack, there is sometimes not agreement in district success in implementing information technology because there is not a substantial focus on IT in general, nor are there continuing conversations amongst the administration that would help align their viewpoints on the success and the needs of the district. Kozlowski (2006) explored the current state of technology usage in schools, as well as the methods and strategies used by principals to be technology leaders. She states in her study that there is a difference in perceptual orientations of district level and building level administrators and that further study of this could help administrators provide better technology leadership to teachers.

Slowinski (2003) discusses a school-wide vision for technology usage and how it is imperative for sustained progress and effectiveness. He also suggests that reform be observable and modeled by all staff, including the superintendent. If system level leadership is not fully modeling and promoting technology with dollars as well as words, building level leaders will feel the disconnect as was described in the interview with the principal in district B. When asked about the district's success in implementing the district technology plan and information technology reform as it relates to 21st century learning, she rated the district as Not Successful and replied, "I think it has been slow. We do not see money coming in from the district level to purchase new hardware." She feels that the high school benefits more from district level funding, but that her K-8 building is left to rely on state funding to purchase technology. In this same district, the superintendent rated the district as Highly Successful on the same question. In

district B, the promotion of technology with dollars at the elementary and intermediate levels is not witnessed by this principal. This causes her to believe they are less successful in IT implementation in her district.

Research Question 3: What is the relationship between the administrators' levels of comfort and the ability to implement change in technology?

The relationship between the administrators' levels of comfort with technology and the ability to implement change in technology was apparent through the interviews. Research indicates that a large portion of school leaders are uncomfortable with using information technology (Bennett, 1996; Gibson, 2001; Ritchie, 1996). However, the administrators in this research project all rated themselves moderately to highly comfortable with using information technology. The research found is not current, however, and it is highly likely that administrators today are more comfortable with using information technology because of its wide availability as well as the expectation of proficiency in the professional world. The participants in this research project all use technology daily and stated that on some level they are self-taught in their technology education by necessity. This usage naturally leads to a greater level of comfort, as evidenced in research by Kozlowski (2006). Her surveys and interviews with principals portrayed that those who had strong feelings about the educational technology questions she asked were the participants that regularly used technology in their own private and professional lives.

It was apparent that the administrators who stated that they were highly comfortable with information technology often defined themselves with a term such as "techie" or other word or phrase to label their comfort with IT. These administrators are intrinsically motivated in the area of IT are naturally drawn to using it more often, and usually learn how to use it through

independent study and practice. As the Zhou and Xu (2007) study states, this internal motivation is the biggest factor in the successful use of information technology. Due to this knowledge base and comfort level, these participants were easily able to talk about their IT use, goals for their building or district, and the modeling of both hardware and software to staff and the board.

Coughlin and Lemke (1999) suggest that school leaders need to be proficient in many areas such as modeling the use of information technology and promoting professional development opportunities in that area if they are going to be successful in implementing technology reform in their schools. The administrators interviewed all understood on some level that modeling the usage of technology as well as promoting its professional development for their staff was important in order to be a leader in technology. Superintendent in District C stated, "When I have opportunities to present I try to ensure that the presentation happens in a technology-rich environment." Similarly, the building principal from the same district said, "I model it, I like it and I am excited about it. You need to know how to work it in front of a group." Some administrators, particularly at the building level, specifically spoke to the ways they model for their staff and understood that staff would use it more if the leadership used it often and effectively. "My staff calls me the chart queen," stated building principal from District A. "It is very easy to put something into Excel and show them in chart form where we need to go from where we are." She believes that once they see how easy it is to use, they are more likely to use it on their own. They also gave examples of technology usage opportunities that they supported due to their proficiency and level of comfort with a piece of information technology. "I started a message board here at school," stated building principal from District G. "I am out there using it, I am very visibly a user of technology."

Age and longevity in the field seem to play a role in administrators' comfort levels of IT usage. Administrators who are in mid to later career have not grown up with information technology nor did they begin their careers using it. The two suburban superintendents who rated themselves a 3 on their level of comfort both have been in the field for many years and IT was not a priority when they began their careers in education. Though they both use technology daily, and are exposed to IT regularly, it is difficult to catch-up to their colleagues who have been practicing since youth. Conversely, the administrators such as superintendent and principal from district G who have been exposed since childhood and throughout their careers are now highly comfortable with information technology in their profession. Many administrators interviewed agree, in order to be comfortable in technology leadership you need to know it. As building principal from district G quipped, "If you don't know it, it is hard to lead it."

Research Question 4: What is the relationship between the comfort level and experiences of the administrators and their perception of their leadership capacity to implement technology?

The relationship between the comfort level and experiences in technology of the administrators and their perception of their leadership capacity with regards to implementing technology was evident. Administrators who use information technology often with their staff spoke of the ways they are able to implement change both in technology, and because of it. The building level leader from District A rated herself a four in comfort and explained how she uses technology every day with staff to share data and make decisions on instruction. She and many others interviewed expressed they would not be able to function effectively without today's information technology capacity." A lot of data analysis we do is through computer generated reports." She stated. Superintendent from District E said, "I use the internet in terms of email

every day without exception. I start the day by checking my (electronic) calendar. I check websites, NYSCOSS, our district website, and NYSSBA." Almost every interview participant mentioned his or her own use of information technology on a daily basis as well.

Perrenaud (2007) found in his interviews that most superintendents believed they were knowledgeable about using word processing and the internet, and that they had a good overall general knowledge base about technology usage. Likewise in this research, district level leaders rated themselves as a four or five out of five in comfort using information technology. However some of these same leaders also admitted they were not the person in the district who was the most knowledgeable in technology, nor would they consider themselves to be the main leader in that domain. Instead, the superintendents would refer to their CIO or Director of Technology as the leader with greater knowledge and understanding of information technology than they have. Superintendent from District B stated when asked if he saw himself as an information technology leader of the district, "I think that is a stretch. I am not afraid and am comfortable with it but I am fortunate to have people that know a lot more about it than I do. They recommend to me what to use and how to use it."

The majority of district level leaders interviewed believed they had the capacity and were doing a solid job in leading the district in information technology and implementing the district technology plan. This is because the superintendents see themselves as the head leader of the organization, inclusive of technology. When superintendent from District F was asked if he saw himself as an information technology leader of the district, his reply was strongly affirmative, "Yes, I see myself as a leader. It is a priority for me in helping to prepare students for 21st century skill learning."

Many leaders shared how they developed a comfort level with technology through using it on their own. They describe how professional development opportunities were not readily available so they became comfortable with technology by using it and learning through trial and error. The research supports this. Miller (2007) noted that principals mentioned the need for professional development in technology multiple times in her interviews with them. Ertmer (2002) stated that professional development needs of administrators in the area of technology were practically ignored until recent times. Brockmeier (2002) agrees, stating that administrators have been left to on-the-job-training in order to learn technology. The administrators in this research project all on some level are self-trained in information technology.

While building principals do not receive professional development regularly in information technology, many principals stated that their superintendent supports their growth in this area. Elementary principal from District D states that his technology professional development "is definitely encouraged." Middle school principal from District C said, "They (the superintendent and the board) just assume that I am going to get it done and have a technology background. I have to balance that with the fact that I have never asked to go somewhere or to learn something where they've said no. They leave it up to me to go and get it." This last statement reflects the overall general sentiment amongst the principals interviewed.

Recommendations for System Level Leaders:

It is clear that in order to be an effective leader in technology, the system level leader needs to be, at minimum, proficient in current information technology, and be willing and able to use it consistently and model it for staff members at all levels. In order to promote reform in technology in schools, the system level leader has to do what he is asking staff members to do. He must use technology effectively every day, in various ways, in order to promote positive

perceptions and active usage of information technology amongst staff members in the school district. The system level leader should seek out professional development opportunities in order to continue growing and learning in this area. It is probable that many teachers and administrators in the district will have much technology ability and be looking forward to using it and promoting its usage in the classroom with students to enhance instruction. System level leaders will be expected by their staff to have a working knowledge of information technology. By modeling its usage during meetings and on conference days, and embracing its benefits within the school and to the community, the system level leader will increase the likelihood of a positive information technology reception by parents, staff and board members, and increase his credibility in this realm as well.

Furthermore, system level leaders should become better acquainted with their districts' technology plans. This research showed that overall most district level leaders were not prepared to speak about their plan, and could not verbalize what it covered without reading the plan. This plan is mandated by the state. Superintendents tend to feel that they have their building leaders and other district level staff such as a Director of Technology to know and understand the plan. However, most superintendents felt they were equipped to handle the job as the leader in the district for information technology. Without a minimal working knowledge of the plan as a vision for the district in this area, the vision, as well as the district goals and objectives for technology would be difficult to portray to staff and eventually students. Superintendents need to be able to explain to staff, families and the board of education where the district intends to go with information technology and how they intend to get there. In their interviews, many building leaders stated that the technology vision for their district was not, in fact, well-voiced in the buildings and beyond.

Recommendations for Building Level Leaders:

Building level leaders are with staff members and students every day. Most students are highly tech-savvy, and the adults in the building need to work hard to catch up. Students and parents in this era expect technology to be used in the classroom. Building principals need to ensure that teachers in the classroom have access to technology and the necessary professional development to be able to utilize it to its maximum potential.

Building principals also must share the needs of teachers and students with the district level leadership if funding or resources are an issue. They are the voice for the staff and students to those who have the ability to allocate funding and resources. Building principals must be well-versed in order to understand the needs, and also to be able to model what he or she expects staff to know and be able to do. It is also highly recommended that principals seek out professional development opportunities for themselves to further their learning. One way to do that is to attend the trainings offered to the staff in the building to have a common knowledge and a common language on the hardware, software, web-based programs and other facets of information technology being utilized throughout.

Though some building leaders knew the contents of their District Technology Plan, especially those with a personal interest and comfort level with information technology, many did not. The recommendations therefore, are the same as for the district level leaders. In order to be a model for technology and be able to voice the vision of the district to the staff and students, building level leaders should have minimally a basic working knowledge of this document so that they can share with teachers the expectations the district has for them. They can also then share with students and the community the exciting events and new learning going on in classrooms due to the district's commitment to information technology usage.

Recommendations for Institutions of Higher Learning that Prepare School Leaders:

Administrators interviewed made suggestions for institutions of higher learning in order to better educate new administrators in the area of information technology. Many administrators suggested that preparatory colleges and universities professionally develop their faculty to be well-versed in information technology so that they can utilize it in their courses and expect that their students will do the same. It is not unusual for college professors to be uncomfortable with new technology. Many administrators interviewed had been through college courses in the last few years yet were not obligated to utilize information technology for much of this coursework. They believed it was due to the professor's own lack of knowledge, practice and comfort.

Faculty at institutions of higher learning need to understand the fast-paced changes that schools are experiencing and the enormous need for teachers and administrators to come out of college preparatory programs in education well-versed in information technology. The world is now heavily reliant on technology. Our students are highly savvy in this arena. Our adults, unless they are self-taught, are often not graduating with a college degree in education prepared to face the new technologies that await them and the children that know more than they do about this high-tech world. This puts these professionals at an immediate disadvantage and they have to begin learning on their own or relying on the school district to provide all of their professional development rather than exiting college prepared to face the 21st century needs of schools and students.

College courses should be redesigned to expect that projects, coursework and other assessments should include a minimum competency level of proficiency that a student needs to acquire and display in order to pass the course. This would be built in as a regular component and become expected of the student in order to pass a course and graduate with a degree. We

expect that our professionals graduating college can read, write, and perform other tasks pertinent to their field of entry. Though information technology proficiency is a newer skill, it has been around long enough to be widely accepted as necessary for functioning in schools and the work place, and is embedded in the 21st century skills that are now common conversation in education. Therefore, information technology proficiency should be expected of our graduating college students and institutions of higher level learning need to adjust their expectations to include this area.

Recommendations for Further Study:

Further research in the area of the potential benefits of self-study for administrators in information technology would be useful. Most of the leaders interviewed in this research project discussed that their higher comfort level and their ability to use technology came from their own self-directed professional development efforts. Some participants stated that this was out of necessity, while others mentioned that they truly enjoyed learning about technology and utilized it until they taught themselves to a level of proficiency or even mastery. Since much of the issue with professional development in the area of information technology comes from not having enough resources such as time and money, it would be useful to know if self-directed study would be of interest to a larger group of administrators, if it would be considered valuable in terms of the amount of learning and the success of the program, if there are programs out there to fill this need and if it would solve some of the resource issues because it costs less or is more flexible with timing.

Another area of suggested research includes delving further into the perceptions and comfort levels of professors at institutions of higher level learning to determine how they affect their teaching and if there could be a connection between their perceptions and comfort levels

and the expected usage of information technology on the part of the students in their courses. Research conducted by Darlene Westinghouse found that although faculty in higher education value technology usage in education, their own actual usage of technology does not reflect this. Furthermore, 90.1 percent of faculty members at these institutions do not teach coursework in educational technology. She recommends that faculty at higher level learning institutions take ongoing professional development courses to increase their comfort level with computers. Additional recommendations are that the New York State Board of Regents mandates a curriculum in leadership technology to be offered at higher level education pre-service administrative programs. Faculty at these institutions would therefore need to develop a strong comfort level and knowledge base about information technology in order to be able to teach this coursework. The current view of many of the participants of this research project is that this is the area to begin effective change. Further research here would benefit this field of study and could include recommendations for how to better prepare administrators entering the field to be 21st Century ready in the usage and promotion of information technology in their schools.

A final area of suggested further study would include the perceptions and comfort levels of administrators to determine how they affect the acquisition and dissemination of IT resources, as well as IT funding and professional development opportunities for teachers in their districts and buildings. Further research in this area would benefit the field by providing information on whether schools, and therefore children, are lacking in resources in information technology due to the decisions by the leadership based on their comfort levels towards information technology.

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Appendix A

SAGE GRADUATE SCHOOL
A member of THE SAGE COLLEGES

Office of the Dean

March 1, 2010

Colleen Carroll
34 Warren Street
Saratoga Springs, NY 12866

IRB PROPOSAL # 09-10-071R
Reviewer: Samuel W. Hill, Chair

Dear Ms. Carroll:

The Institutional Review Board has reviewed your application and has approved the revisions of your project entitled "Technology Leadership Capacity: The relationship between school administrators' perceptions and experiences with information technology and the successful implementation of the school district's technology plan." Good luck with your research.

Please refer to your IRB Proposal number whenever corresponding with us whether by mail or in person.

Please let me know if you have any questions.

Sincerely,

Samuel W. Hill, PhD
Chair, IRB

SWH/nan

Cc. Raymond O'Connell

45 Ferry Street, Troy, NY 12180

Appendix B

Dear

My name is Colleen E. Carroll and I am a doctoral candidate in educational leadership at Sage Graduate School in Albany, New York. I am conducting research in the area of information technology leadership in public schools.

The purpose of this study will be to explore the perceptions and experiences of central office and building level administrators with primary responsibility for information technology implementation. I will be trying to determine if there is a relationship between these perceptions and experiences and their capacity to implement technology reform and the district's technology plan. A qualitative analysis will be conducted that focuses on the leadership issues related to the implementation of the district's technology plan. Methods of inquiry will include interviews of central office administrators who are primarily responsible for information technology, including superintendents, assistant superintendents, and elementary and secondary building principals in the selected and consenting districts. The data collected will be used to explore this under-researched aspect of technology leadership.

As a result of your experiences with leading and implementing information technology in your district via the district technology plan, I would like to invite you to participate in this research study. The interviews will take approximately 45 minutes and will be scheduled at a mutually convenient time. They may take place in person or on the telephone. Prior to the interview, I will collect the district's technology plan, as well as any other pertinent district documents related to technology the district is able to provide to deepen my understanding of this topic. When interviews are conducted in person, I will also be collecting observational data in narrative form. This will include my own personal observations of the representation, usage and comfort level with information technology in the building. This study is confidential and real names will not be used in recording or reporting the data. To maintain confidentiality, the data will be stored on a password protected computer and all data will be destroyed after the doctoral research study is complete. Sharing your knowledge of school leadership as it pertains to information technology will be a most valuable contribution to the field of educational leadership that could serve as a model for future efforts in improving leadership capacity in technology.

Please review the attached document regarding informed consent. If you have any questions regarding the nature or scope of this study as well as your participation, please feel free to contact me at 518.577.1353 cell, 518.693.1428 work or c_carroll@saratogaschools.org. I am looking forward to meeting and interviewing you to gain a better understanding of information technology leadership. Thank you for your consideration.

Sincerely,

Colleen E. Carroll

Appendix C

INFORMED CONSENT FORM

To

You are being asked to participate in a research project entitled**:** *Technology Leadership Capacity:* A study of the relationship between school administrators' perceptions and experiences with information technology and the successful implementation of the school district's technology plan.

This research is being conducted by **:** Colleen E. Carroll

The purpose of this qualitative study is to explore the perspectives of school leaders to learn about their perceptions of and experiences with information technology, and to see if those perceptions and experiences affect the leadership capacity of these individuals in successfully implementing the district technology plan. In conducting the literature review, there appears to be a gap in the research regarding how perceptions and comfort with technology, coupled with the administrator's experience and ability affects their technology leadership capacity and the ability to implement the NYS mandated technology plan.

This study will include nine districts: three rural, three suburban and three urban from the Capital Region of New York State. I will interview one central office administrator with primary responsibility for technology implementation and one or more building level administrators in each district. The interviews will be conducted either in person or on the telephone, at a convenient time for the subject. They will last approximately 45 minutes.

The procedure involves interviews that utilize twelve questions. Eighteen subjects including both building level and district level administrators will be interviewed independently.

When an on-site, face-to-face interview is conducted, the researcher will also collect observational data. The researcher will be observing if informational technology is represented and used at the site, and if there is an apparent comfort level with this technology. The researcher will record notes in a narrative format for data collection and data analysis purposes, and will share these observations with the participant upon completion of the interview for further comment or clarification.

The researcher will collect district technology plans, as well as any other pertinent written documentation regarding technology each district is willing to share. These documents will be collected prior to the interviews. They will support the researcher in gaining a more in-depth understanding of the district's goals and objectives for technology, as well as the leadership expectations for administrators in information technology in each district.

This study is confidential. The data will be stored on a password protected computer and all data will be destroyed after the doctoral research study is complete. In referring to subjects and districts in the written work, the subjects and districts will be assigned pseudonyms to ensure confidentiality.

The benefits of participation are the contribution to the body of knowledge in the area of educational technology leadership that is currently an under-researched area.

There are minimal potential risks for participation in this study. However, due to the interview nature, this study is considered a "minimal risk" study. Risks involve the sharing of information with the researcher in a confidential, but not anonymous, setting.

In the event that I am harmed by participation in this study, I understand that compensation and/or medical treatment is not available from The Sage Colleges. However, compensation and/or medical costs might be recovered by legal action.

I understand that I may at any time during the course of this study revoke my consent and withdraw from the study without any penalty.

I have been given an opportunity to read and keep a copy of this Agreement and to ask questions concerning the study. Any such questions have been answered to my full and complete satisfaction.

I, _____, having full capacity to consent, do hereby volunteer to participate in this research study

Signed: _____

Research participant

This research has received the approval of The Sage Colleges Institutional Review Board, which functions to insure the protection of the rights of human subjects. If you, as a participant, have any complaints about this study, please contact:

Dr. John Tribble, Dean
Sage Graduate School
45 Ferry Street
Troy, New York 12180
(518) 244-2264
tribbj@sage.edu

Appendix D

Interview Questions

The same set of questions will be asked of all participants in survey.

1. Describe your current level of comfort with information technology as it relates to your usage at (1) work, and (2) implementing the district technology plan.
    a. **Prompt:** On a scale of 1-5, 1 being the lowest, 5 being the highest, 3 being moderately comfortable, how comfortable are you with utilizing information technology, in general in your professional work? Please provide examples.

2. What is your own background and experiences in information technology at work?
    a. **Prompt:** On a scale of 1-5, 1 being the lowest, 5 being the highest, three being moderately experienced, how experienced are you with utilizing information technology, in general in your professional work?

3. Describe your perceptions of and feelings towards information technology as they pertain to your leadership capacity in implementing the district technology plan.
    a. **Prompt:** Do you have positive or negative feelings towards technology? Why do you feel this way?

4. Do you think your perceptions of and feelings towards information technology help or hinder your ability to be a technology leader? (…help or hinder your technology leadership capacity?)

5. In this district, whose responsibility is it to implement the district technology plan? If it is not yourself, what role do you play, if any, in its implementation?
    a. **Prompt:** Can you tell me what you know about the district technology plan? Can you provide examples to explain your response?

6. How successful has the district been overall in implementing the district technology plan, and information technology reform as it relates to 21st century skill learning? To what do you attribute this success, or lack thereof?

7. What suggestions would you make to increase the success of the district's implementation of its technology plan?

8. Do you see yourself as an information technology leader of the district/school? Why or why not?

9. Describe your own professional development experience with regards to information technology. Do you feel your own skills have been fostered in information technology and technology leadership?

10. What obstacles do you face in implementing the district technology plan, and information technology reform in your district/school?

11. Has a vision been established in the district with regards to information technology, and has that vision been shared with staff and students? What evidence would you cite to support this?

12. What recommendations would you provide to supervisors or higher level institutions to better support administrative practices and leadership in implementing 21st century information technology skills in schools?