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# Enhancing Education Through Technology: Principa Leadership For Technology Integration In Schools

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**ENHANCING EDUCATION THROUGH TECHNOLOGY:  
PRINCIPAL LEADERSHIP FOR TECHNOLOGY INTEGRATION IN SCHOOLS**

by

**LISA R. RIVARD**

**DISSERTATION**

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

**DOCTOR OF PHILOSOPHY**

2010

**MAJOR: INSTRUCTIONAL TECHNOLOGY**

Approved by:

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Advisor

Date

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## **DEDICATION**

I dedicate this study to my mother and father, Robert and Debra Rivard, who from my very first memories instilled in me a passion of learning and a value of both hard work and pursuit of academic excellence. You are the most amazing examples of strong individuals that anyone could ever ask for. I know you are as proud of me as I am of you, and I love you dearly.

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## CHAPTER 1

### PROBLEM STATEMENT

The world is changing rapidly due to technology, and schools across the United States are challenged with keeping up with these changes. As the United States works toward systemic change in schools, competent educators are necessary to build technology-rich school environments (Holland, 2000). Technology has enabled students to have greater access to a vast array of resources, classes and experts; empowering students to become “Free Agent Learners” who are creating meaningful personalized learning experiences 24 hours/7 days a week outside of the traditional classroom and school structure (Project Tomorrow, 2010). In the 21st century, definitions reflecting a new mindset of how technologies and instructional technologies can best serve learning constantly are being reconstructed. For example, the Association for Educational Communications and Technology (AECT) defines educational technology as “the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (Januszewski & Molenda, 2008).

Effectively using technology within a school system encourages significant school reform (ISTE, 2000). This requires the assistance of educators who integrate technology into the curriculum, align it with student learning goals, and use it for engaged learning projects. This integration requires effective school leadership for comprehensive and appropriate use of technology in schools. According to Picciano (1998), when appropriately integrated into an educator’s vision, technology can be an effective tool in achieving positive outcomes in many areas of school leadership. Two aspects of technology integration have been consistently cited as means for achieving excellence: instructional leadership and professional development (Lockwood, 1999).

School leadership support that reduces or removes integration barriers can assist teachers in moving from traditional teaching beliefs and practices towards successful classroom technology integration. Lack of professional development for technology use is one of the most serious obstacles to fully integrating technology into the curriculum (Fatemi, 1999). The signing of the Elementary and Secondary Education Act into law in 2002, specifically the No Child Left Behind Act (NCLB), has resulted in significant changes to schools nationwide (U.S. Department of Education, 2003). Professional development is a key provision of the NCLB law.

According to the thesaurus of the Educational Resources Information Center (ERIC) database, professional development refers to “activities to enhance professional career growth.” Fullan (1991) expands the definition to include “the sum total of formal and informal learning experiences throughout one's career from preservice teacher education to retirement.” Considering the meaning of professional development in the technological age, Grant suggests a broader definition of professional development that includes the use of technology to foster educator growth (Fullan, 1991, p. 326).

Professional development ... goes beyond the term 'training' with its implications of learning skills, and encompasses a definition that includes formal and informal means of helping teachers not only learn new skills but also develop new insights into pedagogy and their own practice, and explore new or advanced understandings of content and resources. This definition of professional development includes support for teachers as they encounter the challenges that come with putting into practice their evolving understandings about the use of technology to support inquiry-based learning. Current technologies offer resources to meet these challenges and provide teachers with a cluster of supports that help them continue to grow in their professional skills, understandings, and interests. (Grant, 1996, p.2)

The NCLB law mandates that, to the extent appropriate, school districts must provide professional development training for teachers and principals in the use of technology (U.S. Department of Education, 2002). The goal is for technology and technology applications to be effectively used in the classroom to improve teaching and learning in the curricula and core

academic subjects. In 2005, Congress revised NCLB to include the National Education Technology Plan written by the U.S. Department of Education Office of Educational Technology. The plan was developed as part of a long-range national strategy and guide for using technology effectively to improve student academic achievement. The National Education Technology Plan (2005) is meant to help motivate and incite technology-driven transformation within today's schools.

The International Society for Technology in Education's (ISTE) National Educational Technology Standards (NETS) have served as a road map since 1998 for improved teaching and learning by individuals in the field of education. The NETS for Administrators (NETS-A) help to define what administrators need to know and be able to do in order to effectively use and oversee technology in today's schools. NETS-A (2002) identify a framework for effective leadership in technology integration. The six NETS-A standards, which represent a national consensus of knowledge, skills, and dispositions necessary for effective technology leadership in schools include: (Appendix A):

- Leadership and vision
- Learning and teaching
- Productivity and professional practice
- Support, management, and operations
- Assessment and evaluation
- Social, legal, and ethical issues

As critical issues transform from access to effectively integrating technology into curriculum, there has been little research and discussion concerning the extent to which technology leadership behaviors identified in the NETS-A standards from ISTE are being implemented in elementary schools. NETS-A standards clarify the key ideas about what technology leadership means to educators in the field (Anderson & Dexter, 2005). For the purpose of this research, it is the technology standards published by ISTE that form the framework of the survey used in this study.

Standards for educational administration preparation programs and professional practice are a topic of intense interest continually being discussed by professional organizations and university preparation programs across the nation, including in the State of Michigan. In 2004, the Michigan Department of Education (MDE) approved a new set of program standards for the preparation of school principals. This program was created from two specific sets of existing national standards. First, is the Interstate School Leader Licensure Consortium Standards for School Leaders (ISLLC) (Council of Chief State School Officers, 1996) which specifically addresses the topics of leadership and vision, instruction and student academic success, allocation of resources, school and community relations, ethics, and the political, social, legal, and cultural context of leading schools. These standards correlate closely with the NETS-A.

The Technology Standards for School Administrators (TSSA, 2004), is the second set of standards incorporated into the Michigan Department of Education preparation guidelines. These standards are a national consensus among educational stakeholders of what best indicates effective school leadership for comprehensive and appropriate use of technology in schools and has been adopted by the International Society for Technology in Education (ISTE) as the National Educational Technology Standards for Administrators (NETS-A). In most recent months, ISTE released a “refreshed” set of standards for the NETS-A, however for the purpose of this study, the use of these revised standards has not been implemented long enough for a valid study.

Effective leadership for technology in a school is a significant predictor of its use by teachers and students (Anderson & Dexter, 2005). Over the past few decades, technology has become increasingly prevalent in schools. Integration of technology into the curriculum, especially at the elementary level, has improved but still requires a good deal of attention on the part of administrators. Studies have continually indicated that this is a most serious issue

(Becker, 1994; Fatemi, 1999, Park & Staresina, 2004; Picciano, 1991, 2010; Sheingold & Hadley, 1990, U.S. Congress, 1995).

With the emergence of new technologies in today's classroom, the purpose of this study was to analyze to what extent elementary principals employ behaviors that support their role as a technology instructional leader, using the framework of NETS-A Technology Standards for Administrators from ISTE. This study demonstrated how Michigan Elementary Principals adapt to the introduction and integration of new technology in their schools. As described the State of Michigan Educational Technology Plan (2006), educational technology is defined as a powerful means of improving student learning. Through a quantitative method this study determined how Michigan Elementary Principals rated the level of importance of the NETS-A. The study also determined Michigan principals' interest in professional development related to the NETS-A. Finally, through a qualitative method, this study described the current practice and implementation of the NETS-A by Michigan Elementary Principals.

This study was based on the premise that the role of school administrator is crucial to successful classroom technology integration. If classroom technology integration is to be successful, leaders should possess knowledge regarding availability and nature of the school-based support, resources, professional development, vision, and incentives necessary to encourage change within a school environment (TSSA Collaborative Report, 2001). It is anticipated that this study will help to inform professional development needs regarding technology skills and technology integration of practicing and future elementary principals in the State of Michigan. Specifically, this study addresses the following research questions (Billheimer, 2007):

1. How important do Michigan Elementary Principals rate the NETS-A related to Standard I, leadership and vision, to the job of the principalship?

2. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard I, leadership and vision?
3. How important do Michigan Elementary Principals rate the NETS-A related to Standard II, learning and teaching, to the job of the principalship?
4. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard II, learning and teaching?
5. How important do Michigan Elementary Principals rate the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship?
6. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard III, productivity and professional practice?
7. How important do Michigan Elementary Principals rate the NETS-A related to Standard IV, support, management, and operations, to the job of the principalship?
8. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard IV, support, management, and operations?
9. How important do Michigan Elementary Principals rate the NETS-A related to Standard V, assessment and evaluation, to the job of the principalship?
10. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard V, assessment and evaluation?
11. How important do Michigan Elementary Principals rate the NETS-A related to Standard VI, social, legal, and ethical issues, to the job of the principalship?
12. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard VI, social, legal, and ethical issues?



### **Assumptions and Limitations**

This study assumed that the National Educational Technology Standards for Administrators (NETS-A) were recognized as common standards that were somewhat familiar to the principals in Michigan elementary schools. This study may have been limited because of the restricted population of solely pre Kindergarten through sixth grade elementary level administrators in the state of Michigan.

Since the sample of participants for the interview process was selected based on recommendation, the data could also be limited. Finally, this study asked administrators to self-report their interpretation of the level of importance of the technology standards and the need for additional professional development. The validity of the study depended upon administrators' insightful responses to accurately and honestly report their perceived level of importance of the NETS- A standards.

### **Significance of the Study**

The significance of this study was to bring greater awareness of Michigan schools' current state of technology use, principals' methods and strategies for technology integration and how the influence of effective professional development opportunities lead to improved school technology integration efforts. Additionally, this study sought to identify past experiences with technology use, the strategies and tools that principals have used to facilitate instructional leadership practices and to investigate what changes need to occur as a result of technology integration in relationship to the NETS-A standards.

The concepts outlined above were worth studying in order to learn how to better prepare principals for the emergence of a global society's demand of technology competent principals. This study may help to align current perspectives of administrator preparation in regards to technology skills and technology leadership to the NETS-A framework of standards developed.

Ideally, this study will help educational leaders develop professional development opportunities that integrate these constructs as a part of their school technology integration efforts.

### **Summary**

Chapter 1 has presented the background of the study, the problem statement, and significance of the study. In addition, assumptions and limitations for the study also are presented in this chapter. A comprehensive review of related literature is included in the second chapter, with a detailed explanation of the methods that were used to collect the data needed to address the research questions presented in Chapter 3. A description of the sample and results of the data analysis that addressed the research questions can be found in the fourth chapter. The summary, conclusions, and recommendations for further study are presented in Chapter 5.

## CHAPTER 2

### LITERATURE REVIEW

This chapter reviews the literature on several research studies surrounding the topics of school administrators and technology leadership including: (a) importance of technology to educational reform, (b) technology standards for school administrators, (c) technology preparation for school administrators, (d) creating a vision for technology, and (e) technology efforts in Michigan. This section uses literature and research to define best practices in educational leadership and the need for technology leaders within today's schools.

Additionally, the building principal, called upon to be a technology leader, is expected to provide a clear and defined vision to influence changes in instructional practices so that technology becomes an important tool in the teaching and learning process, and becomes a part of the larger school reform efforts. As seen throughout this review, to uphold the responsibilities of technology leader, principals are in need of further training and professional development in the area of technology leadership.

#### **Importance of Technology to Educational Reform**

Integrating technology throughout a school system has been understood to produce significant systemic reform. Many researchers and educational organizations have noted that strong leadership is a vital component of successful technology-based school reform (Anderson & Dexter, 2005; Byrom & Bingham, 2001; Gibson, 2002; Martin, Gersick, Nudell, & Culp, 2002; National School Boards Foundation, 2002.)

Technology is a part of our children's everyday lives. They don't know a time without space travel, pagers, cell phones, and the Internet. While most educators concur that technology is important to student learning, many are finding that integrating technology into the educational systems and using it in ways that increase student learning and achievement are far more complex tasks than expected. The digital age is literally knocking on the schoolhouse door. Despite the fact recent public opinion polls indicate communities are strongly supportive of technology in schools, there remains a lack of sophistication among the

majority of schools across the United States. The unique combination of what is known today about brain research and cognitive learning theory, combined with the high-speed networked computers that are slowly making their way into schools, presents educators with opportunities never before possible. The question is whether or not educators and the education system will act strategically enough to capitalize on this unique opportunity. (Lemke and Coughlin, 1998, p. 8)

In a recent survey entitled “Speak Up about the Emerging Technologies for Learning” (2009) conducted by Project Tomorrow, a national nonprofit organization, studies concluded:

- 91% of parents communicate via IM, e-mail, or text
- 51% of parents use social networking tools
- 85% of students have iPods
- (30% of those are in grades K-2)
- The number of high school students taking on-line courses has doubled since 2008. (Project Tomorrow, 2010)

Despite these growing trends, the absence of strong leadership at the school level could undermine much needed education reforms. Without basic technology competency, it stands to reason that most school leaders lack the ability to understand the various policy and planning issues related to the successful implementation of technology. In the report, “Creating our Future: Students Speak Up about their Vision for 21<sup>st</sup> Century Learning,” Project Tomorrow (2010) outlined evidence that students are using technology to take responsibility for their own learning, often times bypassing traditional educational settings. Project Tomorrow (2010) reveals that the effective integration of technology within instruction is imperative to the survival of schools. These growing issues have begun to impact the call for the beginning stages of the latest reform movement taking over schools in the United States.

We must leverage it (technology) to provide engaging and powerful learning experiences, content and resources and assessments that measure student achievement in more complete, authentic, and meaningful ways. Technology-based learning and assessment systems will be pivotal in improving student learning and generating data that can be used to continuously improve the education systems at all levels. Technology will help us execute collaborative teaching strategies combined with professional learning that better prepares and enhance educators’ competencies and expertise over the course of their careers.

To shorten our learning curve, we can learn from other kinds of enterprises that have used technology to improve outcomes while increasing productivity. (National Technology Plan Draft, 2010, Executive Summary)

A survey conducted by the Consortium for School Networking (2004), recommended that to improve the use of technology, schools should “move from automating administrative practices to transforming teaching and learning, invest in technology leadership, and create new professional development initiatives” (p. 2). Considerable evidence attests to the importance of leadership in implementing and sustaining reform in schools. Administrators with instructional vision for digital literacy, not just traditional literacy and schooling are needed to ensure reform that is productive in the 21<sup>st</sup> century and beyond.

In response to on-going developments in technology, the U.S. Department of Education's Office of Educational Technology once again revised the national technology goals first presented in 1996. In March 2010, the United States Department of Education released a draft of the National Educational Technology Plan: “Transforming American Education: Learning Powered by Technology.” United States Secretary Of State, Arne Duncan, described the new plan as a representation of researchers’ best ideas about how schools can become centers of learning designed to close the gap between the technology-rich and exciting experiences that dominate students’ lives outside of school while preparing them for success in today’s competitive global marketplace (National Technology Plan Draft, 2010). The proposed National Technology Plan (2010) has been designed with the following intentions:

- Be clear about the outcomes sought.
- Collaborate to redesign structures and processes for effectiveness, efficiency, and flexibility.
- Continually monitor and measure performance.
- Hold all stakeholders accountable for progress and results every step of the way.

Technology-based learning is fundamental in the design of the plan and will be crucial for measured success within the national education system at all levels. As outlined in the draft National Education Technology Plan, technology is the core of nearly every aspect of our lives. The plan presents a model of learning that is built upon the following five key concepts and a goal specific to each:

- Learning

Goal: All learners will have engaging and empowering learning experiences both in and outside of school that prepare them to be active, creative, knowledgeable, and ethical participants in our globally networked society.

- Assessment

Goal: Our education system at all levels will leverage the power of technology to measure what matters and use assessment data for continuous improvement.

- Teaching

Goal: Professional educators will be supported individually and in teams by technology that connects them to data, content, resources, expertise, and learning experiences that can empower and inspire them to provide more effective teaching for all learners.

- Infrastructure

Goal: All students and educators will have access to a comprehensive infrastructure for learning when and where they need it.

- Productivity

Goal: Our education system at all levels will redesign processes and structures to take advantage of the power of technology to improve learning outcomes making more efficient use of time, money, and staff.

Project Tomorrow (2009) concluded that overwhelmingly, district administrators (90%) and principals (92%) report that the effective implementation of instructional technology is important or extremely important to their mission. Further analysis revealed that district administrators are more likely than principals (55%) and teachers (38%) for preservice teachers (38%) to believe the integration of technology is extremely important to their district's core mission. While administrators envision the potential for social-based learning environments, such as using blogs, wikis, and podcasts, the Project Tomorrow (2009) data suggests school leaders are just not there yet. Don Knezek, Director of the TSSA Standards Project, ISTE, stated "Integrating technology throughout a school is, in itself, significant systemic reform. We have a wealth of evidence attesting to the importance of leadership in implementing and sustaining systemic reform in schools. It is critical, therefore, that we attend seriously to leadership for technology in schools" (TSSA, 2001)

### **Technology Standards for School Administrators**

A developing field within the progressively more diversified world of educational leadership is technology leadership. According to Mehlinger and Powers (2002), "It is no longer possible for administrators to be both naive about technology and be good school leaders" (p.218). Administrative leadership is considered an important factor affecting the successful integration of technology into schools (Bingham & Byron, 2001). As schools strive to achieve in the "Information Age," they need leaders who are experienced in the potential and complication of information and communication technologies for our nation's students.

A national organization has developed a set of standards for school administrators that can serve to guide and support administrators as they assume their role as technology leaders (Technology Standards for School Administrators Collaborative [TSSA], 2001). The TSSA Collaborative includes representatives from organizations such as the American Association of School Administrators, the National Associations of Elementary and Secondary School Principals, the National School Boards Association, and the International Society for Technology in Education. Faculty from higher education, teachers, consultants, district technology coordinators, and not-for-profit organizations also participated in the initiative. The outcome of their collaborative work was represented through the Technology Standards for School Administrators (TSSA Collaborative, 2001). According to the TSSA Collaborative, the standards focus on the role of leadership in enhancing learning and school operations through the use of technology. However, the standards do not represent a comprehensive list or assurance for effective technology leadership (TSSA Collaborative, 2001).

A year after the development of the TSSA Collaborative standards, the International Society for Technology in Education (ISTE) published its National Educational Technology Standards (NETS-A) for Administrators (International Society for Technology in Education-ISTE, 2002). Given the leading role that ISTE had in the development of the TSSA Collaborative Standards, ISTE adopted the TSSA Collaborative work and built on it by developing a list of essential conditions for implementing the NETS for Administrators (ISTE, 2002). NETS is an initiative of the International Society for Technology in Education (ISTE) and was funded by NASA in consultation with the U. S. Department of Education, the Milken Exchange on Education Technology, and Apple Computer. NETS-A were developed through an extensive perspective input and feedback process of practitioners and experts in the field.



The NETS-A standards published by ISTE are important in establishing an identity for technology professionals and defining the critical roles and responsibilities school leaders assume in developing 21<sup>st</sup> century schools in America (Redish, 2008). The leadership of technology integration and implementation requires that school leaders possess a range of knowledge and skills; the NETS-A standards for leaders provide a comprehensive list of these. The NETS-A consist of six standards related to visionary leadership; learning and teaching; professional practice; systemic improvement; assessment and evaluation; and social, legal, and ethical issues (ISTE, 2002).

An underlying assumption to the NETS-A standards is that administrators should be competent users of information and technology tools common to information-age professionals. While interest in NETS-A is emerged since the release, and some professional development activities have been developed, very few research studies include the standards. According to Creighton (2003), these standards enable us to move from just acknowledging the importance of administrators in defining the essentials of what administrators need to know and be able to do in order to fulfill their responsibility as leaders in the effective use of technology in our schools.

From these standards, the TSSA Collaborative released the “NETS-A Profiles for Technology Literate Principals” (Appendix B). A profile was written for each of the six standards and consists of specific tasks that principals who effectively lead the integration of technology in their schools should be able to do. This profile can be used to serve as a tool for administrators to help them understand the level of proficiency expected to run technology savvy schools.

### **Technology Preparation for School Administrators**

One of the most significant factors affecting technology leadership is the need for professional development for school principals. Dawson and Rakes (2003) conducted an exploratory study with K-12 principals and found those involved in long term technology-curriculum integration training significantly influenced the level of technology use at the school. The U.S. Congress, Office of Technology (1995) states that training administrators alongside teachers and engaging other stakeholders in the use of technology supports technology use in the classroom.

The principal's preparation in technology is a key element in promoting technology success in schools (Hope, Kelley & Kinard, 1999), yet very little attention has been given to preparing school administrators for their role as technology leaders. Because they often may have not received adequate preparation for technology use in their preservice experience, many school principals have had to learn at the same time as they try to use the technology. Unfortunately, there is very little research delineating best practices for preparing administrators to be technology leaders. Most school administrators attain their technology knowledge and skills on the job, with occasional training provided by various technology or educational resource vendors, professional organizations, in-district professional development, or colleges and universities.

According to Mehlinger and Powers (2002), "Graduate school programs generally are doing a poor job in preparing school principals and superintendents to be technology leaders". Very few school leaders had training in their preparation programs or as part of professional development efforts to deal with technology issues (Riedl, 1998). University educational leadership programs also have been slow to adapt to schools' rapidly increasing needs for technology-savvy administrators (McLeod, 2004; (McLeod, S., Logan, J., & Allen, J., 2002).

Integrating technology in leadership education programs ensures that candidates are skilled in various technology applications, integration strategies and management techniques. As a result, many of today's administrators are novice technology users and have very little experience necessary to be effective technology leaders. Research indicates that few school administrators use technology meaningfully to improve the efficiency and effectiveness of their own work (Riedl et al., 1998). The result is a large-scale absence of effective technology integration and a consequential lack of impact on student achievement. Price (2004) in an article entitled "New Age Principals" expressed the following concern:

Both current principals, and those entering the principalship for the first time, find that they are ill-prepared to manage an infrastructure that supports instruction and has as its constant focus the technical core of teaching and learning. (p.36)

Furthermore, Price (2004) recommended that all principals, develop the following four skills to create and manage the type of infrastructure needed to support instructional improvements:

1. Ability to manage information
2. Ability to analyze and use data to determine areas in need of improvement
3. Ability to align and monitor curriculum to meet needs
4. Ability to build a professional community of learners (stakeholders) committed to instructional improvement

Price states that all four of these skills are important; however, the last is the most critical as a school leader.

The importance of principals, superintendents, and other leaders participating in professional development activities should not be underestimated (Picciano, 2010). Few of today's school leaders are educated or prepared to meet the new demands and challenges of modern school environments (National Center for Education Statistics, 2005). Few districts sufficiently train practicing administrators to facilitate the effective uses of technology in schools

or to use technology meaningfully to improve the efficiency and effectiveness of their own administrative work (Consortium for School Networking, 2004; Dawson & Rakes, 2003; Riedl, Smith, Ware, Wark, & Yount, 1998). The Education Schools Project (Levine, 2005) suggests that many school administrators are educated for jobs that no longer exist.

Being an effective building manager used to be good enough. For the past century, principals mostly were expected to comply with district-level edicts, address personnel issues, order supplies, balance program budgets, keep hallways and playgrounds safe, put out fires that threatened tranquil public relations, and make sure that busing and meal services were operating smoothly. And principals still need to do all those things. (Institute for Educational Leadership, 2000, p. 2)

Principals face the task of reinventing schools and classrooms in a society that has been transformed by digital technologies, and many feel overwhelmed by the mandate to integrate technology in every subject and grade. Increasingly, school principals are required to assume leadership responsibilities in areas with which they are not familiar, and for which they have received little training. According to O'Dwyer, Russell, & Bebell (2004) perceived pressure from principals and other administrators to use technology is one of the most powerful factors in increasing technology use for teaching and learning. Sandholz, Ringstaff, and Dwyer (1997) found school leadership crucial in determining whether or not teachers would integrate technology. As the instructional leaders, administrators are relied on to provide valuable support for teachers. Brockmeier, Sermon, and Hope (2005) examined the state of Florida school principals' relationships with computer technologies, by investigating the following questions:

1. Are school principals prepared to facilitate the integration of computer technology into the teaching and learning process?
2. Are principals prepared to use computer technology for administrative and managerial tasks?

Overall, the study revealed that while school principals recognized the importance of giving teachers time to develop the expertise to integrate technology in their instruction, a

significant percentage of principals also recognized the need for their own professional development to facilitate technology integration in their schools. Moreover, while many principals have acknowledged the value of technology, they did not feel prepared to call themselves technology leaders and they were not willing to share decision-making about technology with their teachers. The 2004 ACT Policy report titled “Evaluating the Effectiveness of Technology in Our Schools,” Noeth and Volkov concluded that administrators and teachers should receive adequate, tailored, and continuing education about how to best integrate technology into their schools and courses, and should be evaluated on their proficiency.

According to Picciano (2010), school administrators are finding that teachers new to the field or recent graduates of teacher preparation programs are more familiar with technology but continue to need ongoing training to keep their skills honed. In addition, administrators need to encourage and support professional development opportunities related to technology. Because some teachers are less comfortable with technology than with other aspects of their teaching, they need constructive feedback that will enable them to take risks using technology in even more ways. As Sandholtz, Ringstaff, and Dwyer (1997) explained, “the benefits of technology integration are best realized when learning is not just the process of transferring facts from one person to another, but when the teacher's goal is to empower students as thinkers and problem solvers” (p. 176).

To help classroom teachers craft a pivotal crossing point between students and educational technology, administrators require ongoing training and guidance in understanding impacts of technology on educational change, technology management and financial issues, and administrative uses of technology (Hall, Strangman, & Meyer, 2003). In order to model the use of technology for others, leaders must become technology users themselves and be involved in the planning and implementing of technology in their own schools. Furthermore, district

technology leaders should introduce school principals to the different available technology resources and the role of technology in advancing their schools, with the hope that they will more likely assume a proactive role in advocating and supporting the use of technology in their schools (Hall, Strangman, & Meyer, 2003).

### **Creating a Vision for Technology**

With stakes high and the education of today's youth at risk, the need for effective leadership is urgent. Schools that have made the most progress toward technology adoption and integration have school leaders with a vision of what is possible through the use of technology. Chang (2008) defined a technology leader as "one who leads the school in improvement or restructuring, and uses emerging technologies as the core resources for educational change" (p. 241). These school leaders model the use of technology, support best practices in instruction and assessment and provide professional learning opportunities for their staff.

Studies in the past decade have shown that computer technology is an effective means for widening educational opportunities, but most principals or teachers neither use technology as an instructional delivery system nor integrate technology into their curriculum. Thomas (1999) found that many administrators use e-mail, power point, spreadsheets and data bases programs. However, he also reported that the link between school leadership and educational technology is weak.

Principals who effectively lead technology integration within their schools typically perform well in leadership and management, vision and goal setting, student learning, teaching, professional development and training, operations and infrastructure support, and assessment and evaluation (ISTE, 2001). According to Flanagan and Jacobsen (2003), the use of Information Communication Technology (ICT) in education is being seen as a way of widening access to education. Technology use, if it is to be beneficial, needs to be implemented systemically rather

than in isolation. Technology integration is meant to be cross-curricular rather than become a separate course or topic in itself. The objective of technology leadership is to influence teachers to integrate information communication technology in their everyday instructional practices. Overall, the goal of technology integration is to support principals as they explore and experiment with diverse ways to integrate technology.

In “Maximizing the Impact: The Pivotal Role of Technology in a 21st Century Education System” (2007), the International Society for Technology in Education (ISTE), The Partnership for 21st Century Skills, and the State Educational Technology Directors Association stated that technology can be used in nine key areas to assist with teaching and learning:

- Building conceptual understanding of core content;
- Addressing misconceptions;
- Fostering inquiry and investigation;
- Applying knowledge and skills to interdisciplinary challenges;
- Creating and transforming knowledge for meaningful purposes;
- Collaborating with others;
- Apprenticing with experts;
- Engaging and motivating students; and
- Differentiating instruction to meet individual needs. (pp. 9-10).

School leaders are in a unique position to inspire a vision for technology and allocate the financial and human resources to ensure complete and sustained implementation of the vision (Creighton, 2003). It is expected that principals model the use of technology in meaningful ways and expect educators to use technology in all areas of the curriculum. This shared vision for technology must be consistent with the district's overall educational vision, and technology plans must smoothly integrate with overall planning for school effectiveness. It is important that

today's students, and thus schools, come to think of computers and networks as an integral part of how they experience the world, manage the opportunities and problems it presents, and grasp how learning may take place in the course of using these information technology tools. Students may be less dependent on the traditional role of teachers, as we know them today, and may rely more on teachers as resource coaches who can help them electronically navigate through a vast assortment of educational resources and learning opportunities.

Sandholz, Ringstaff, and Dwyer (1997) found school leadership crucial in determining whether or not teachers would integrate technology into core content areas. School leaders must coach, model instructional practices, and mentor teachers to step away from the traditional role of lecturer to that of facilitator of learning. As our society rapidly gravitates towards a digital future, schools will be forced to become sophisticated at using multiple technologies to nurture, manage, and enhance learning for all students. It is critical, therefore, that we attend seriously to leadership for technology in schools (Technology Standards for School Administrators, 2005). Valdez (2004) reviewed the findings of current research and summarized that technology impacted student achievement with an effect size range between .30 and .40. However, school leaders must make certain that teachers obtain sufficient professional development, support, and instructional resources to recognize such technological benefits.

The potential of instructional technology has yet to be realized because “technology integration requires systemic reform, which must be supported by school and district leadership. The reality is that many school administrators don’t have the necessary background in either system change or technology integration to make such reforms. “Whether technology-enhanced learning will produce the desired deep, long-term, systemic changes will depend greatly on the quality of the professional growth experiences and sustained support in which teachers engage.”(Darling-Hammond & Berry, 1998), “In this new millennium, regardless of one’s



political, sociological, or educational philosophy, technology should not be something separate from but should be part of every school leader's vision. It should not be the centerpiece of the vision, but it undoubtedly has a role to play in the future of every school" (Picciano, 2010).

### **Technology Efforts in Michigan**

In Michigan, the state education technology plan (2006) consisted of one goal: *Prepare Michigan students to become productive citizens in a global society*. There were eight objectives that represent both the reasonable and the systemic approach necessary to achieve this goal. The state's intention was to write a usable, educational technology plan that incorporated the guidance found in the National Education Technology Plan 2004 (NETS), *Toward a New Golden Age in American Education*, January 2005, and to meet the needs of the state.

According to Michigan's technology plan, one indicator states: *Every Michigan educator will have the technology competencies to enable the transformation of teaching and learning to improve student achievement*. The group that developed the plan commented that the challenge of moving to this mode of teaching and learning is significant and requires considerable time and solid support from school administrators and fellow teachers. "Educational technology is not a simple solution that is quickly applied; it is not painting the walls to give a room a fresh look. Educational technology takes wisdom and perseverance" (State of Michigan Educational Technology Plan, 2006)

A recent report titled "The Digital Disconnect: The Widening Gap between Internet Savvy Students and Their Schools," from the Pew Internet and American Life Project (Pew, 2007), finds that students are rapidly moving ahead of our schools in technology use. In the report Michigan identifies this as a need to develop technology leadership at all levels in order to create and implement a fundamentally transformed educational system that is customized for each student, is data driven and technology facilitated, is readily extended beyond traditional

time and space considerations, and through which professional educators markedly increase student motivation, achievement, and readiness to be productive citizens in a global society. (State of Michigan Educational Technology Plan, 2006)

School administrators need to understand and provide effective leadership about the application of educational technology. This means the competency of all educators must be addressed through professional learning and development. The professional learning and development must be an ongoing process of reflective practice, a shared effort among the educators within each school, aligned with state and national standards, and tied to curriculum objectives (State of Michigan Educational Technology Plan, 2006). It is recognized in this report that this includes a long term process, with each educator continuously building their skills and knowledge, and increasing the benefits to student learning.

Historically, Michigan has been a leader in educational technology use in our schools. One vital indicator of that is Michigan Association for Computer Users in Learning (MACUL), the largest professional organization for teachers and administrators. MACUL is a non-profit organization established in 1975 and dedicated to bringing Michigan educators from all levels together to share their knowledge and concerns regarding educational uses of computers and technology. MACUL has been known as a leading force in building professional partnerships with organizations including the Michigan Virtual University, the Michigan Department of Education, and several other community sponsors to benefit educators and students in the fundamental use of technology in education. In the past teacher support and professional development in Michigan have been addressed by a number of statewide initiatives, including the Michigan Technology Implementation Project, Ameritech Technology Academy, Teach for Tomorrow, Intel's Teach to the Future, and Michigan Teacher Network. There also had been a major program for administrators, Leading the Future, with Gates Foundation funding.

According to the “Michigan Technology Plan Today”, Michigan has lost its momentum and is no longer among the leaders. Funding for these programs has diminished in the last few years and a number of the statewide programs have ceased or are minimally maintained. The level of development of new educational resources in statewide projects, for teachers or students, is much less than it was. (State of Michigan Technology Plan, 2006)

Each year, the publication *Education Week* publishes a special issue titled “Technology Counts”, which provides comparative data on the programs in each state. In the May 5, 2005 issue (Education Week, 2008), Michigan ranked towards the bottom (Appendix C). Inevitably with the already low achievement scores in this report and the depleting funds designated for continued technology issues, Michigan faces a crisis in the area of technology leadership. (State of Michigan Technology Plan, 2006)

Further complicating the situation in Michigan, are the dramatic changes as a result of globalization. Michigan citizens have experienced first-hand the crumbling of its once world renowned industries and jobs. Many of the high-skill jobs that pay well, and the associated taxable income, have been outsourced to other nations. It is inevitable that education may be the key factor in any hopes of revitalizing Michigan’s once stable economy. However, Michigan students continue to be outperformed by other nations’ students. Elizabeth W. Bauer, Chair, State Board of Education Task Force on Embracing the Information Age remarked:

Educators today must prepare students for purposeful engagement in the world. We are passing from an industrial age to the age of information and innovation. To this end, technology is a powerful instructional tool and transformative force. Policy makers must assure all students equitable access to technological tools and instruction so they are prepared to participate with confidence, competence, and creativity in a global society. (State of Michigan Educational Technology Plan, 2006, p.3)

It should be noted that in early 2010, the Michigan Department of Education approved a revised state technology plan. The 2010 State of Michigan Educational Technology Plan

includes the 2010-2012 goals and objectives of the Michigan State Board of Education and the Michigan Department of Education (MDE) related to increasing and improving learning options and outcomes for all Michigan prekindergarten through grade 16 students through effective application of educational technology and data to inform instruction. For the purposes of this study, the newly approved plan will serve as a reference but research for this study will be indicative of the 2006 Technology Plan which was in place during the time of this study.

### **Summary of Literature**

The literature confirmed the importance of the principal's role in successful implementation of technology. ISTE provided performance standards with the NETS-A to assist in identifying effective principals in technology implementation. NETS-A standards were the result of a national consensus among educational stakeholders of what best indicates effective school leadership for comprehensive and appropriate use of technology in schools. These standards have been adopted by the ISTE. The NETS-A consist of six standards related to (a) leadership and vision; (b) learning and teaching; (c) productivity and professional practice; (d) support, maintenance, operations, and finance; (e) assessment and evaluation; and (f) social, legal, and ethical issues (International Society for Technology in Education, 2002). As issues concerning the lack of systemic change in school reform and technology integration persisted, little research had been published concerning the extent to which technology leadership behaviors identified in the NETS-A standards were being implemented in schools.

The present study demonstrated how Michigan elementary principals adapted to the introduction and integration of new technology in their schools. This study of principals in Michigan provided data for decision making in the area of technology leadership. The purpose of this study was to analyze the extent to which elementary principals employed behaviors that supported their roles as a technology instructional leader, using the framework of NETS-A

Technology Standards for Administrators from ISTE, and how they adapted to the introduction and integration of new technology in their schools. Through the quantitative method this study also determined how Michigan elementary principals rated the level of importance of the NETS-A and what their interest was for professional development related to the NETS-A. The resulting data provided research findings on how technology increasingly has become an important factor in the school curriculum and in the education system, resulting in the need for comprehensive professional development to support and sustain technology leadership.

## CHAPTER 3

### RESEARCH METHODOLOGY

Chapter 3 consists of an overview of the methodology including the research design, population and sample, instrumentation, data collection procedures, and data analysis. Both quantitative and qualitative measures were used in this mixed methods study to investigate the research questions regarding principal leadership and technology integration. This study was based on the premise that the role of school principals and the continuous facilitation of professional development opportunities are important aspects of reform and are essential means for achieving excellence in today's schools.

The purpose of this mixed methods study was to analyze the extent to which elementary principals employed behaviors that supported their role as technology instructional leaders, using the framework of NETS-A Technology Standards for Administrators from ISTE, and how they adapted to the introduction and integration of new technology in their schools.

A mixed-methods approach was used to collect both quantitative and qualitative data for this study. Through a quantitative method this study determined how Michigan elementary principals rated the level of importance of the NETS-A. The study also determined Michigan principals' interest in professional development related to the NETS-A. Using qualitative methods, this study described the current practice and implementation of the NETS-A by Michigan elementary principals identified as effective technology leaders. This research examined how technology is increasingly becoming an important factor in the school curriculum and in the education system, as it is seen to enhance and improve student learning.

The quantitative methodology consisted of a survey sent to all Michigan K-6 public school principals in Michigan. The *Survey of Technology Experiences* (Appendix D; Billheimer, 2007) consisted of 18 close-ended items developed from the six standards of leadership and

vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. Each principal was asked to rate the level of importance for each statement in relation to their own position of principalship. According to Billheimer, the survey items related to the six standards of the NETS-A were rated using a 7-point Likert scale to measure the importance of the standards. The level of importance of the items from the six standards of the NETS-A had responses on a scale from 1 to 7 with the following criteria: 1 = "Not important", 4 = "Important" and 7 = "Very Important." Additional items on the survey related to the principals' interest in professional development. Respondents had the option of answering "yes" or "no" to each of the 18 items related to the six standards of the NETS-A. Demographic data also were collected. The survey collected data to address a series of research questions directly related to each of the six areas of the NETS-A standards described below:

- *Leadership and vision* - Educational leaders should inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision (ISTE, 2002).
- *Learning and teaching* - Educational leaders should ensure that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching (ISTE, 2002).
- *Productivity and professional practice* - Educational leaders should apply technology to enhance their professional practice and to increase their own productivity and that of others (ISTE, 2002).
- *Support, management, and operations* - Educational leaders should ensure the integration of technology to support productive systems for learning and administration (ISTE, 2002).

- *Assessment and evaluation* - Educational leaders should use technology to plan and implement comprehensive systems of effective assessment and evaluation (ISTE, 2002).
- *Social, legal, and ethical issues* - Educational leaders need to understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues (ISTE, 2002).

Semi-structured personal interviews were conducted to gather more qualitative data, which were analyzed in triangulation with quantitative data. The researcher conducted all interviews using the same protocol (Appendix E). Interviews were conducted in person, unless distance was an issue. All interviews were recorded with interviewee's permission (Appendix F), which were transcribed by the researcher. Member check was conducted to ensure data accuracy.

### **Population and Sample**

The population for this study was Michigan elementary public school principals and assistant principals including public charter school elementary principals. The names of participants were taken from the Educational Entity Master Application – Michigan's public electronic data base located at [www.michigan.gov/eem](http://www.michigan.gov/eem). This data base is maintained by the Center for Educational Performance and Information (CEPI). CEPI collects and reports data about Michigan's K-12 public schools. The survey was conducted by sending a survey through the mail. Approximately 2,000 K-6 public elementary school principals in Michigan were included in the population. Elementary was defined as a school servicing kindergarten through sixth grades. Participants needed to be certified in K-8 or K-12 administration.

Surveys were mailed to 770 elementary principals randomly selected to participate in the study. To select the 770 principals to be surveyed, the list of approximately 2,000 principals was entered into MS Excel spreadsheet. Using the random number function of MS Excel, a list of



principals was generated. Of this number, 280 completed and returned their surveys for a response rate of 36.4%. According to Kerlinger and Lee (2000), the expected return of an unsolicited survey is approximately 20%.

Ten public elementary school principals from a variety of K-6 public school districts were identified for the in-depth interviews. An email was sent to the technology directors at each of the intermediate school districts across Michigan, asking them to identify any principals who were effective technology leaders in the geographical region based on the “Profiles for Technology-Literate Administrators.” This profile was developed based on the ISTE National Educational Technology Standards (NETS) and Performance Indicators for Administrators. The identified participants were entered into a MS Excel list and randomly selected and invited to participate. These identified principals participated in in-depths interviews regarding their training and practice for technology leadership.

### **Instrumentation**

Three methods of data collection were used in this study. The purpose of the survey (Billheimer, 2007) was to collect demographic information and data on principals' perceptions regarding their practice in technology integration. The questions on demographic specifications helped to establish and distinguish any similarities or differences in the participants' work setting and location as it may have an impact on the principal's ability to establish leadership methods for new initiatives. Data collected from the survey included: number of years of experience in education field, current position, number of years at current school in current position, degree held by participant, gender, age, and professional development in regards to technology.

The goal of the survey instrument was to determine principals' perceptions of the importance of NETS-A and their interest in participating in professional development for technology in their schools (Billheimer, 2007). The survey sought to generalize that the current

state of school technology use and principal leadership for technology integration had the potential to be a contributing factor for future efforts to connect technology leadership and successful school reform in the elementary school setting. Participants in this study were asked to complete a survey on technology experiences. The large sample size of the survey allowed the researcher to begin to recognize patterns in the data and to further investigate those patterns through the use of an in-depth interview of a sample derived from the initial survey sample.

After review of multiple surveys, the “Survey of Technology Experiences” (Billheimer, 2007) was suggested for use due to its unique alignment with the NETS-A standards. The “Survey of Technology Experiences” consisted of 18 close-ended items developed from the NETS-A, with each item rated using a seven-point Likert scale. Principals were asked to rate the level of importance for each statement in relationship to their role as a principal. The questions were developed in relationship to the standards of leadership and vision; learning and teaching; productivity and professional practice; support, management and operations; assessment and evaluation; and social, legal, and ethical issues. Billheimer (2007) used the performance profile for technology-literate principals from the NETS-A as a reference in question construction for the survey. Three questions were developed for each of the standards for a total of 18 items (Billheimer, 2007). The following table represents the survey questions and how they related to the research questions.

Table 1

*Survey Statements Representative of Research Questions*

Research Questions	Statements Taken from Survey
1. How important do Michigan Elementary Principals rate the NETS-A related to Standard I, leadership and vision, to the job of the principalship?	1A, 2A, 3A
2. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard I, leadership and vision?	1B, 2B, 3B
3. How important do Michigan principals rate the NETS-A related to Standard II, learning and teaching, to the job of the principalship?	4A, 5A, 6A
4. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard II, learning and teaching?	4B, 5B, 6B
5. How important do Michigan Elementary Principals rate the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship?	7A, 8A, 9A
6. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard III, productivity and professional practice?	7B, 8B, 9B
7. How important do Michigan Elementary Principals rate the NETS-A related to Standard IV, support, management, and operations, to the job of the principalship?	10A, 11A, 12A
8. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard IV, support, management, and operations?	10B, 11B, 12B
9. How important do Michigan Elementary Principals rate the NETS-A related to Standard V, assessment and evaluation, to the job of the principalship?	13A, 14A, 15A
10. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard V, assessment and evaluation?	13B, 14B, 15B
11. How important do Michigan Elementary Principals rate the NETS-A related to Standard VI, social, legal, and ethical issues, to the job of the principalship?	16A, 17A, 18A
12. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard VI, social, legal, and ethical issues?	16B, 17B, 18B

Additional items on the survey related to professional development. Respondents had the option of answering “yes” or “no” when asked about professional development related to the standards. This survey had been validated by Billheimer (2007) and seeks to establish the leadership experiences of principals related to technology. Billheimer had the survey validated by several experts in the field to assure content validity (Appendix G). Ultimately, this survey tool sought to specifically identify the current state of school technology use as it related to technology use as a tool and instructional strategy.

Although Billheimer (2007) did not report on the reliability of the instrument, the internal consistency for the responses in the present study was examined using Cronbach alpha coefficients. The resulting alpha coefficient of .92 was indicative of good internal consistency.

Additional research was gathered through in-depth interviews. This type of qualitative data helped to provide depth, to the qualitative findings of the survey. The interviews were complimented with an interview script. The interview script included open-ended questions along with more specific questions for the purpose of gathering as much data as possible. There were two questions relating to each of the six NETS-A standards. Interview questions were listed in Appendix H. The interview of at least 10 principals was used to further investigate the leadership methods and strategies that are used by principals to lead technology integration in accordance with the NET-S standards. Using both a survey and interview helped the researcher to strengthen the knowledge claims and the validity of data collection in the study.

The researcher interviewed 10 participants face-to-face unless, distance and time prohibited this, then a phone interview was conducted. The technology directors and support staff at various Intermediate School Districts throughout Michigan recommended names of elementary principals recognized as effective technology leaders. The identified participants were entered into a MS Excel list and randomly selected and invited to participate. Specifically, the interview data served to strengthen insights and provided examples of successful strategies and tools used in the implementation of technology integration at the leadership level. This type of information presented a general picture regarding effectiveness of principal leadership for technology integration.

A pilot study was conducted with three randomly selected principals who had not been chosen to participate in the larger study. After this pilot, no concerns were raised regarding the survey instrument. An interview was conducted with one of the three participants. The

elementary principal was identified by a local intermediate school district as a highly effective leader of technology. The interview was very lengthy and some questions were revised. This pilot study assisted the researcher in determining the quality of the interview protocol so that revisions could be made if necessary. The questions were also restructured to fit in categories related to the six NETS-A standards.

### **Data Collection Procedures**

Two methods of data collection were used. The quantitative survey was conducted as a paper-pencil survey. All principals randomly selected received the survey and consent form by mail. The mailed packets included a brief cover letter, a copy of the Survey of Technology Experiences (Billheimer, 2007) with directions, and an addressed and stamped envelope for convenient return and the consent form. The surveys were precoded with a 3-digit number so that returns could be monitored and follow-ups could be sent out without having to re-survey those who originally respond. The returned surveys were tracked daily with a return rate graph. A reminder was sent out after two weeks. A second mailing was conducted to those requesting an additional mailing. As completed surveys and consent forms were returned, they were opened and reviewed.

The interviews were conducted face-to-face or by phone when distance hindered the opportunity. Qualitative interviewing consisted of 10 participants and used an open-ended method. Interviews with participants were scheduled in advance to allow for enough time for discussion of questions and conversation. The researcher contacted each participant by phone to request an interview. With permission of the participant, interviews were recorded, transcribed, and coded (Appendix H). Triangulation was used to compare and analyze data collected. These data included the collection of the demographic data, survey results and the in-depth interviews. Interviews ranged from approximately 45 to 90 minutes in length.

## Data Analysis

Quantitative data were analyzed using descriptive statistics and other appropriate statistical analyses. The data were analyzed to determine how Michigan elementary principals rate the level of importance of the NETS-A and to determine their interest in professional development related to the six NETS-A standards. The researcher used statistical analysis for the survey data and coding for both the survey and interview data. Final analysis resulted in a report containing statistical averages and percentages as well as a descriptive report of the coded results. The in-depth interview data sought to further develop the methods and strategies that principals' use for technology integration as related to the current state of technology use in their school. Table 2 presents the statistical analyses that were used to address each research question.

Table 2

### *Research Design Outline for Each Question*

Research Questions	Data Collection	Data Analysis
1. How important do Michigan Elementary Principals rate the NETS-A related to Standard I, leadership and vision, to the job of the principalship?	Survey – Q 1A, 2A, 3A Interview-Q 1, 2	Statistical Analysis Coding Descriptive Analysis Coding
2. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard I, leadership and vision?	Survey- Q 1B, 2B, 3B Interview-Q 1, 2	Statistical Analysis Coding Descriptive Analysis Coding
3. How important do Michigan principals rate the NETS-A related to Standard II, learning and teaching, to the job of the principalship?	Survey- Q 4A, 5A, 6A Interview-Q 3, 4	Statistical Analysis Coding Descriptive Analysis Coding
4. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard II, learning and teaching?	Survey- Q 4B, 5B, 6B Interview-Q 3, 4	Statistical Analysis Coding Descriptive Analysis Coding
5. How important do Michigan Elementary Principals rate the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship?	Survey- Q 7A, 8A, 9A Interview-Q 5, 6	Statistical Analysis Coding Descriptive Analysis Coding

Research Questions	Data Collection	Data Analysis
6. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard III, productivity and professional practice?	Survey- Q 7B, 8B, 9B Interview-Q 5, 6	Statistical Analysis Coding Descriptive Analysis Coding
7. How important do Michigan Elementary Principals rate the NETS-A related to Standard IV, support, management, and operations, to the job of the principalship?	Survey- Q 10A, 11A, 12A Interview-Q 7, 8	Statistical Analysis Coding Descriptive Analysis Coding
8. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard IV, support, management, and operations?	Survey- Q 10B, 11B, 12B Interview-Q 7, 8	Statistical Analysis Coding Descriptive Analysis Coding
9. How important do Michigan Elementary Principals rate the NETS-A related to Standard V, assessment and evaluation, to the job of the principalship?	Survey- Q 13A, 14A, 15A Interview-Q 9, 10	Statistical Analysis Coding Descriptive Analysis Coding
10. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard V, assessment and evaluation?	Survey- Q 13B, 14B, 15B Interview-Q 9, 10	Statistical Analysis Coding Descriptive Analysis Coding
11. How important do Michigan Elementary Principals rate the NETS-A related to Standard VI, social, legal, and ethical issues, to the job of the principalship?	Survey- Q 16A, 17A, 18A Interview-Q 11, 12	Statistical Analysis Coding Descriptive Analysis Coding
12. Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard VI, social, legal, and ethical issues?	Survey- Q 16B, 17B, 18B Interview-Q 11, 12	Statistical Analysis Coding Descriptive Analysis Coding

This study combined a quantitative analysis of the responses to the survey with qualitative analysis of themes generated by the discussion. Emergent themes were used to organize the data. The researcher coded the patterns of themes and coded the factors from the statistical analysis into themes so that the results from the two methods could be compared and described in narrative form (Reissman, 1993). Data analysis was organized according to the research questions, analytic insights and themes emerged during the data collection and analysis. The narrative analysis also highlighted professional development needs for principals as collected in the survey and interview collections. Triangulation of data was used to support the assertions to be identified and the integrity of the inferences to be made. Results of the surveys

and results of the interviews were studied in comparison to the NETS-A standards to support any inferences made in this research study. The researcher organized the quantitative survey data and qualitative interview data and secured it for appropriate access. The approval to conduct the study by the Wayne State University Human Investigation Committee is located in Appendix J.

### **Researcher Identity**

The researcher has worked in the field of education for 13 years. She has held the role of classroom teacher, lead technology teacher, elementary school principal, and administrator on special assignment for curriculum. Her credibility was presented to participants as a colleague in the practicing field. The researcher's experience as an active practitioner in the field of education, a school administrator in a Michigan public elementary school, and a central office administrator in a large school district has empowered her with appropriate field knowledge to conduct the study. This experience enabled the researcher with familiarity to the participants, which was particularly helpful in conducting the interviews, as well as interpreting the qualitative data. At the same time, such identity could have brought biases into the data collection and analysis processes. Thus, member checking was conducted with participants to ensure accuracy and various data were triangulated to establish trustworthiness of the study.

### **Ethical Considerations**

This study was not intended to harm the principals involved in completing the survey or in completing the interview process. All surveys were collected anonymously unless the survey participant voluntarily offered his/her contact information. All presentation of data from survey responses and interviews used numbers or pseudonyms to maintain the anonymity of the participant. The researcher, an educator in a Michigan school district, was not working directly with any of the participants in the study and had no influence over their professional evaluation. The participants were informed of the research objectives, data collection methods and data



collection devices. Transcriptions of the interview data as well as the documentation of the final data analysis were made available to participants upon request. Finally, all participant and researcher forms were filed with appropriate parties for future review if necessary.

### **Summary**

This mixed methods study used both a quantitative and qualitative approaches. The study analyzed to what extent elementary principals employ behaviors that supported their role as a technology instructional leader, using the framework of NETS-A Technology Standards for Administrators from ISTE, and how they adapted to the introduction and integration of new technology in their schools.

## **CHAPTER 4**

### **RESULTS**

This chapter presents results of the statistical analyses that have been used to describe the participants and address the research questions developed for this study. The chapter also includes the summary of the interviews that were conducted with 10 principals in Michigan schools. The chapter is divided into three sections. The first section uses descriptive statistics to provide a profile of the participants, with the research questions addressed in the second section. Additional analyses are included in the third section to add supportive information about the use of technology in schools.

This study demonstrates how Michigan elementary principals adapt to the introduction and integration of new technology in their schools. Through a quantitative method this study determines how Michigan elementary principals rate the level of importance of the National Educational Technology Standards – Administrators (NETS-A). The study also examines Michigan principals' interest in professional development related to the NETS-A. Finally, through qualitative research, this study describes the current practice and implementation of the NETS-A by Michigan elementary principals.

A total of 770 surveys were distributed to Michigan elementary principals and assistant principals. Of this number, 280 principals and assistant principals returned their completed surveys for a response rate of 36.4%.

#### **Description of the Sample**

The participants provided their positions on the survey. Their responses were summarized using frequency distributions. Table 3 presents results of this analysis.

Table 3

*Frequency Distributions: Position of the Respondent*

Position of the Respondent	Number	Percent
Assistant Principal	4	1.4
Principal	271	98.2
Other	1	.4
Total	276	100.0
Missing	4	

The majority of the participants (n = 271, 98.2%) reported their positions as principal, with 4 (1.4%) indicating their positions were assistant principals. One (0.4%) participant reported “other” as their position, but did not provide any additional information. Four participants did not provide a response to this question.

The participants were asked to provide their age and educational levels on the survey. Their responses were summarized using frequency distributions for presentation in Table 4.

Table 4

*Frequency Distributions: Age and Educational Level*

Age and Educational Level	Number	Percent
Age		
21 to 30	1	0.4
31 to 40	63	22.9
41 to 50	81	29.5
51 to 60	98	35.6
61 and over	32	11.6
Total	275	100.0
Missing	5	
Highest Level of Education		
Bachelors	1	0.4
Masters	171	62.2
Education Specialist	82	29.8
Doctorate	21	7.6
Total	275	100.0
Missing	5	

The largest group of respondents ( $n = 98$ , 35.6%) were between 51 and 60 years of age, with 81 (29.5%) indicating their ages were between 41 and 50 years of age. Thirty-two (11.6%) participants were 61 and over. Five participants did not provide a response to this question.

The majority of participants ( $n = 171$ , 62.2%) reported that completion of a master's degree was their highest level of education. Eighty-two (29.8%) had completed an education specialist and 21 (7.6%) had obtained a doctorate degree. Five participants did not provide a response to this question.

The participants were asked to indicate the number of years they had worked in education and the number of years they had been in their present positions. Their responses were summarized using descriptive statistics. Table 5 presents results of this analysis.

Table 5

*Descriptive Statistics: Educational Experiences*

Educational Experiences	Number	Mean	SD	Median	Range	
					Minimum	Maximum
Years in Education	276	24.16	9.64	24.00	6	46
Years in Present Position	275	7.76	6.70	6.00	1	38
Missing Years in Education	4					
Years in Present Position	5					

The participants reported they had worked a mean of 24.16 ( $sd = 9.64$ ) years in education. The median number of years in education was 24, with a range from 6 to 46 years. Four principals did not provide a response to this question. The participants had been in their present positions for a mean of 7.76 ( $sd = 6.70$ ) years, with a median of 6 years. The range of time in their present positions ranged from 1 to 38 years. Five participants did not provide the length of time in their present positions.

The participants were asked to indicate the location of their school community. Their responses were summarized using frequency distributions. The results of this analysis are presented in Table 6.

Table 6

*Frequency Distributions: Location of the School*

Location of the School	Number	Percent
Rural	96	35.8
Suburban	134	49.6
Urban	40	14.8
Total	270	100.0
Missing	10	

The largest group of participants ( $n = 134$ , 49.6%) identified the location of their schools as suburban and 96 (35.8%) reported their schools were located in rural locations. Forty (14.8%) participants indicated that their schools were located in urban areas. Ten principals did not provide a response to this question.

The participants were asked to indicate the grade levels of students in their buildings. Their responses were divided into four distinct categories and summarized using frequency distributions. Table 7 presents results of this analysis.

Table 7

*Frequency Distributions: Grade Levels of Schools*

Grade Levels of Schools	Number	Percent
PreK through 5 <sup>th</sup> grade	181	66.1
PreK through 8 <sup>th</sup> grade	80	29.2
PreK through 12 <sup>th</sup> grade	12	4.4
Other	1	0.3
Total	274	100.0

Missing 6

The majority of participants (n = 181, 66.1%) were in schools with grade configurations that included prekindergarten through fifth grades. However, some of these schools had different grades (e.g., prekindergarten through 1<sup>st</sup> grade, 2<sup>nd</sup> through 4th grade, 2<sup>nd</sup> through 5<sup>th</sup> grade, etc.). Eighty (29.2%) participants reported grade levels of prekindergarten through 8<sup>th</sup> grades and 12 (4.4%) were in schools that included grade levels from prekindergarten through 12<sup>th</sup> grades. One (0.3%) participant reported that his school was ungraded with students from 5 to 25 years of age.

The principals and assistant principals were asked if they did work-related technology activities from home. The results of this analysis are presented in Table 8.

Table 8

*Frequency Distributions: Do Work-related Technology Activities from Home (N = 280)*

Type of work-related technology activities from home	Number	Percent
Routinely access e-mail	276	100.0
Missing 4		
Do work-related technology activities routinely from home		
Yes	244	89.7
No	28	10.3
Missing 8		

All of the respondents indicated they routinely access e-mail (n = 276, 100.0%), with 4 participants failing to provide a response to this question. The majority of the principals and assistant principals (n = 244, 89.7%) routinely did work-related technology activities from home. Eight participants did not respond to this question.

The participants were asked if they had participated in technology-related professional development or if they had taken an online course. Their responses were summarized using frequency distributions for presentation in Table 9.

Table 9

*Frequency Distributions: Technology-related Education (N = 280)*

Technology-related Education	Number	Percent
Participated in technology-related professional development (# of hours)		
Less than 1 hour	27	9.8
1 and 4 hours	122	44.4
5 and 10 hours	71	25.8
11 hours or more	55	20.0
Missing	5	
Taken an online course		
Yes	140	51.7
No	131	48.3
Missing	9	

The largest group of respondents (n = 122, 44.4%) had participated in 1 to 4 hours of technology-related professional development. In contrast, 27 (9.8%) had participated in less than 1 hour of professional development. Five participants did not provide a response to this question.

The majority of the principals and assistant principals (n = 140, 51.7%) reported that they had taken an online course. Nine participants did not provide a response to this question.

Ten principals participated in one-on-one interviews to obtain additional information about the use of technology in their positions. The technology directors and support staff at

various Intermediate School Districts throughout Michigan recommended names of elementary principals recognized as effective technology leaders. From this list, 10 principals representing various years of experience, rural, urban and suburban areas, and males/ females were interviewed. Five of the principals were interviewed face to face and the remaining five were interviewed via telephone. The interviews for principals in the metropolitan Detroit area were interviewed in person. Other principals who were located in other areas of the state were interviewed on the telephone. After seeking permission from the principals, interviews were recorded. The interviews typically lasted from 45 to 90 minutes. The principals provided information on their personal and professional characteristics. Table 10 summarizes their responses.

Table 10

*Demographics for Interviews*

	<u>Gender</u>		<u>Age of Respondent</u>				<u>Location of School District</u>		
	Male	Female	21-30	31-40	41-50	51-60	Rural	Suburban	Urban
Interview #1	X			X				X	
Interview #2		X			X				X
Interview #3	X				X		X		
Interview #4		X		X				X	
Interview #5	X		X					X	
Interview #6		X			X			X	
Interview #7	X			X					X
Interview #8		X				X	X		
Interview #9	X					X	X		
Interview #10	X			X					X



Six (60.0%) of the participants were male, with 40.0% identifying their gender as female. One (10.0%) principal indicated that he was between 21 and 30 years of age, with four (40.0%) reporting they were between 31 and 40 years of age. Two (20.0%) principals were between 41 and 50 years of age, with 2 (20.0%) indicating their ages were between 51 and 60 years of age. Three (30.0%) of the principals were in urban schools with a similar number reporting they were in rural schools. Four (40.0%) of the principals were in suburban schools.

### **Quantitative and Qualitative Analyses for Research Questions**

Twelve research questions were developed for this study. Each of these questions was addressed using frequency distributions, following the same format as Billheimer (2007).

The survey items related to the six standards of the National Education Technology Standards for Administrators (NETS-A) and used a 7-point Likert scale. The *Survey of Technology Experiences* (Appendix D) consisted of 18 close-ended items developed from the six standards of leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. The level of importance of the items from the six standards of the NETS-A had responses on a scale from 1 to 7 with the following criteria: 1 = “Not important”, 4 = “Important” and 7 = “Very Important”. Additional items on the survey relate to interest in professional development. Respondents had the option of answering “yes” or “no” when asked about interest in professional development for each of the 18 items taken from each of the six standards of the NETS-A.

In addition, interview responses related to each research question are presented in this section. Using coding techniques, participants’ answers (transcripts) were thematically aggregated for important emerging category analysis. Four consistent themes emerged from the transcript data: engaged learning and teaching, data collection, professional development, and

budget shortage problems. Additional analyses using inferential statistical analyses are also included in the section, Ancillary Findings.

*Research question 1.* How important do Michigan Elementary Principals rate the NETS-A related to Standard I, leadership and vision, to the job of the principalship?

The responses to the three items, included on Standard I, were summarized using descriptive statistics. The results of these analyses are presented in Table 11.

Table 11

*Descriptive Statistics: Standard I - Leadership and Vision – Importance*

I believe that a principal should:	Number	Mean	SD
1. Participate in a district wide process for developing a shared vision for technology use.	279	5.78	1.33
2. Work with staff to develop technology-rich school improvement plan grounded in research.	279	5.96	1.17
3. Support a strong technology committee within the school.	279	5.81	1.24
Standard I – Leadership and Vision	280	5.85	1.01

The mean scores for the three items indicated that principals and assistant principals considered Standard I – Leadership and Vision to be between important and very important. The overall mean of 5.85 (sd = 1.01) for the first standard was indicative that principals and assistant principals considered this standard to be important.

*Research question 2.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard I, leadership and vision?

The responses to the three items measuring principals’ and assistant principals’ interest in professional development for Standard I, leadership and vision were summarized using frequency distributions. Table 12 presents results of these analyses.

Table 12

*Frequency Distributions: Standard I: Leadership and Vision – Interest in Professional Development*

Interest in Professional Development	Number	Percent
1. Participate in a district wide process for developing a shared vision for technology use.	130	50.2
Yes	129	49.8
No		
Missing 21		
2. Work with staff to develop technology-rich school improvement plan grounded in research.	160	61.3
Yes	101	38.7
No		
Missing 19		
3. Support a strong technology committee within the school.		
Yes	101	39.3
No	156	60.7
Missing 23		

The majority of participants (n = 130, 50.2%) indicated they were interested in participating in professional development for developing a shared vision for technology use. Twenty-one participants did not provide a response to this question. Most participants (n = 160, 61.3%) were interested in professional development to work with staff to develop a technology-rich school improvement plan grounded in research. Nineteen principals and assistant principals did not provide a response to this question. When asked if they were interested in professional development to support a strong technology committee within the school, 101 (39.3%) answered yes. Twenty-three participants did not provide a response to this question.

*Interview questions 1 and 2.* While the survey asked principals to identify the level of importance of leadership and vision in regards to participation in district wide planning, developing a technology rich school, and supporting a school-based technology committee, the interviews with principals provided additional insight and several examples of the potential of technology leadership in Michigan schools. Each of the interviewees commented on their own

vision for the school to progress in technology usage. One strand that emerged was that technology is currently seen as a potential way to strengthen existing curricula that supports meaningful, engaged learning for students. All ten interviewees (100%) agreed that their role as principal was important to the facilitation of technology usage within their school buildings. The interviewees all stated there was not a written statement of a school vision of the use of technology; although, most believed there was a “feeling” or foreseen commitment that it was important at their school. Nearly half of the principals felt that providing a vision for technology was historically a district led initiative. Evidence from the interviewees notes, suggest that 60 % of principals interviewed were surprised to be considered in the planning and creating of a vision for the district as this was typically completed at the district level. One interviewee stated, “We have a vision of what we want each classroom to have and so what I have to do is to be the visionary and that is what a principal’s job is...to get the resources.” (Interviewee 3, Line 765) Principals’ reluctance to providing the interviewee with written documentation of a building or district vision within a plan was evidence that creating, supporting, or implementing a common and collaborative vision for the building was not considered until the question was raised. After review of seven of the ten interviewed principals’ school improvement plans, no buildings had mentioned the use of technology within this document either.

The comments of the principals interviewed regarding a building wide vision of technology varied and included the following topics: using technology as a tool for the delivering curriculum and integrating it into instruction, providing technology as visionary support for students, making technology a vehicle for communication with parents, staff, and colleagues, using technology as a means for collection of data and accessing reporting systems, and providing further access to professional development and support systems. One principal stated,

“To me, principals are expected to be the key leaders of curriculum within their buildings. This includes technology.” (Interviewee 10, Line 2992)

Several principals commented on their visions of using technology in new ways for the future. These ideas included installing more Promethean boards or Smart boards for classroom use, providing all teachers and students with laptop computers, and adopting core instructional materials that have technology resources embedded in them such as the “Envisions” math program. Many of the principals commented on the continued use of communication efficiency devices such as list serves, email and blog resources, and electronic phone tree systems that can mass produce a phone message to the entire school community. One interviewee suggested, “I would like to continue with the positive movement towards technology integration in all subject areas. I am proud of where we are at in the process, yet I think we also have a lot of work to continue. We will need extensive professional development in several key areas such as data to guide instruction and the use of hands-on technology like Smart Boards and clickers.” (Interviewee 7, Line 1969)

Two principals of the 10 interviewed (20%) discussed their plans for the facilitation of providing every teacher in the district with a laptop computer in the next few months. Both of these principals referred to the professional development plans they would provide to teachers hosted by Apple, Inc. One of the same two principals explained their strategic means of fundraising over the last two years that just allowed the school to purchase Promethium interactive technology for every classroom in the school.

Every principal commented on the recent priority to implement the use of on-line data management systems that allow for teachers and data team members to access student assessment information in a timely manner which then allows for educators to make suitable decisions related to student strengths and weaknesses. One interviewee commented, “At the

district, school, and classroom levels, educators can then create and analyze custom reports. But we are just skimming the surface of learning this. We have had quite a bit of professional learning in the data tools but there is so much more to learn.” Two principals remarked on the ease of the data management system to score tests using a scanner that within just a few minutes produces results.

Ten of 10 (100%) principals interviewed stated that at least a district technology plan was in place. Two principals commented that a building plan was also in place and one of those two had several parent and community members partaking in the creation of the plan two years ago. The same principal mentioned the collaboration of the local intermediate school district in support of both creating and carrying out a school-wide plan. Each principal commented on the role of technology key resource leader/s or support staff member rather than a building committee that helped to either create a school plan or to help guide and support initiatives within the plan. Eight of ten principals (80%) also noted the use of key resource teachers or lead teachers at each grade level that help with the implementation of new technologies into the classroom. Technology leaders or representatives included: principals, district technology staff, building technology support staff, media teachers, para-professionals, key resource teachers, or intermediate school district support personnel. Only two principals commented on having established committees at the building level.

One interviewee mentioned the use of a technology survey that was used with both teachers and students to help comprise a building plan. “The expectation we have in our district is that kids are prepared for a global world, which means we really need to consider interacting on a much bigger scale. The goals that we write for our building in each subject area each year for our school improvement plan, they take that into consideration...” (Interviewee 10, Line 3145) After review of the school improvement plans for this building, the interviewee could not

find evidence that technology was specifically included or embedded within the current school improvement plan.

*Research question 3.* How important do Michigan Elementary Principals rate the NETS-A related to Standard II, learning and teaching, to the job of the principalship?

The participants' responses to the three items included on Standard II – Learning and Teaching were summarized using descriptive statistics. Table 13 presents results of this analysis.

Table 13

*Descriptive Statistics: Standard II – Learning and Teaching – Importance*

I believe that a principal should:	Number	Mean	SD
4. Promote effective practices in technology integration to improve instruction.	279	6.36	.94
5. Provide teachers with technology to design, assess, and modify student instruction.	277	6.27	1.12
6. Participate in professional development with instructional staff for effective technology integration.	279	6.18	1.06
Standard II – Learning and Teaching	280	6.27	.89

The means for the importance of each of the three items measuring Standard II – Learning and Teaching were above 6.00, indicating that the principals and assistant principals considered each of these items to be approaching very important. The overall mean for Standard II of 6.27 (sd = .89) provided support of the importance of this Standard II.

*Research question 4.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard II, learning and teaching?

The principals' and assistant principals' responses to the interest in professional development for the three items measuring Standard II, Learning and Teaching were summarized using frequency distributions. Table 14 presents results of these analyses.

Table 14

*Frequency Distributions: Standard II – Learning and Teaching – Interest in Professional Development*

Interest in Professional Development	Number	Percent
4. Promote effective practices in technology integration to improve instruction.		
Yes	201	77.6
No	58	22.4
Missing 21		
5. Provide teachers with technology to design, assess, and modify student instruction.		
Yes	185	71.7
No	73	28.3
Missing 22		
6. Participate in professional development with instructional staff for effective technology integration.		
Yes	188	72.3
No	72	27.7
Missing 20		

The majority of principals and assistant principals (n = 201, 77.6%) indicated they were interested in professional development to promote effective practices in technology integration to improve instruction. Twenty-one participants did not provide a response to this question. Most participants (n = 185, 71.7%) reported that they would like professional development to provide teachers with technology to design, assess, and modify student instruction. Twenty-two participants did not provide a response to this question. A total of 188 (72.3%) principals and assistant principals indicated they would participate in professional development with instructional staff for effective technology integration. Twenty participants did not provide a response to this question.

*Interview questions 3 and 4.* While survey items asked principals to identify the level of importance of learning and teaching related to promoting technology integration, providing technology to design, assess and modify student instruction, and participation in professional development with staff for technology integration, interviews provided further insight and



examples of technology leadership in Michigan elementary schools. Throughout the interviews, principals articulated a wide range of answers when asked about technology integration in teaching and learning. The answers ranged from describing specific technology tools to recounting examples of what they would consider successful technology integration within their own schools. The following includes descriptions and examples from principals interviewed.

The themes of a shared vision and a focus on engaging pupils were most predominant in the principal interviews. When asked about what effective technology integration looks like within the elementary classroom, all principals indicated that students would be using laptop computers, computer labs, assistive technology for special needs, I-pods, participating in a video conference, or engaging in a lesson provided by the teacher on Promethean or Smart board technology. One principal responded “technology serves its main purpose of engaging students in authentic and hands-on activities.”

For effective technology integration, most principals described the use of computer programs and internet resources to aid student learning including: Accelerated Reader, Kidspiration, Read Naturally, United Streaming, Kid Pix to name a few. Most principals also spoke of students using technology tools such as: presentation software like Power Point, word processing tools like Alpha Smarts, and display tools such as documentation cameras or “Elmos.” One interviewee commented “Technology is a tool we use to assist the curriculum, for conducting research and for making presentations.” (Interviewee 1, Line 30)

One principal remarked that they and the teaching staff spent considerable time rewriting the curriculum standards in grades K-2 so that the technology standards were embedded into the various subject areas. For effective teaching in learning, nearly all principals mentioned that some teachers are beginning to use projectors or interactive white boards, referred to as Promethean boards or Smart boards, for use in conducting lessons for students. Nine of ten

(90%) of principals interviewed had expressed the need to expand these resources and the professional development opportunities so that all teachers and students could be provided with the opportunity to use the equipment. Some principals remarked that they had the equipment installed in a central site within the building so that all teachers could have an opportunity to sign out the room and use the equipment. One interviewee commented on her vision for technology in the future, “I think that as we go further in depth with technology and the prices eventually come down, I definitely would like to immerse more of my students in the use of technology. I hope to get every teacher on board and get them the training they need, because they are all at different learning levels.” (Interviewee 1, Line 358) Another interviewee envisioned her students being able to have exposure to “daily interactions for kids and not something that is just a special occasion.” (Interviewee 2, Line 523)

All principals provided examples of what students might be doing if the teacher was effectively integrating technology:

- Communicating with experts via video conferencing equipment
- Using the interactive white boards for interactive activities
- Taking a Zoomerang survey on the internet
- Presenting using Power Point
- Brainstorming writing ideas with Kidspiration or Inspiration
- Viewing examples with a document camera
- Using calculators during mathematics lessons
- Listening to audio books during literacy stations
- Taking a virtual field trip
- Using clay animation to re-enact a story
- Using clicker technology to take a quiz

- Creating music using Garage Band
- Making I-movies

All principals interviewed stated examples of technology to engage students in learning. All principals recognized the need for further exploration of engaged learning and the need for technology to be embedded into more instructional practices by teachers. All ten principals interviewed also expressed additional need for support and professional development for teachers but only six principals expressed the need for this type of training for themselves. Principals each mentioned the many challenges of providing such hands-on technology based learning. Issues stated in interviews included the need to provide exciting, technology-supported activities for all students, particularly students at-risk as school may be the only means for some students to experience technology resources. One veteran principal of thirty years of service to education reflected, “I am excited about the future and the way classrooms are going to look, if we even have classrooms, but there is just something in me that continues to say that students should be able to experience real life ways of learning.” (Interviewee 3, Line 1183) Further discussion with this principal focused around the need for additional time to learn and implement technology resources in conjunction with professional development initiatives so that both teachers and students could be brought to a greater level of computer literacy. “If you are not spending the money to teach people, then you know it’s not going to be used,” commented that same veteran principal.

All principals interviewed talked in depth about teachers using technology to make data based decisions for instruction. One interviewee suggested, “technology saves a lot of time too as it helps narrow things down, target kids that may be struggling, identify the State of Michigan GLCEs (Grade Level Content Expectations) that the kids do not understand, as opposed to going through countless, countless pieces of paper.” (Interviewee 6, Line 1642) Another commented,

“technology use has really promoted data driven decision making efforts in which teachers can easily monitor student progress and track changes.” (Interviewee 7, Line 1830) Several principals discussed their recent professional development on this topic and the ease of using technology for assessment tracking such as the DIBELS assessment for reading which allows school personnel to enter and monitor individual reading performance and produce reports within seconds of entering data. All principals mentioned using data to make decisions based on student needs particularly in the area of assistive technology support for implementing Individualized Education Plans (IEPs).

All of the principals interviewed believed there was a need for more relevant and meaningful professional development and training for technology integration. Six principals interviewed discussed promoting and participating in professional development with teachers for technology integration. All principals discussed efforts for providing recent professional development for data warehouse management systems such as Data Director. All principals stated that the majority of the professional development currently taking place in their schools was based on more administrative uses than instructional uses of technology. Although the principals participated in and provided many less opportunities for instructional use of technology, more than half of principals also mentioned the training they had set -up for their staff on interactive white board use, yet only two principals were versed in using this technology themselves. One principal commented on their willingness to learn the tool and has recently begun to model using the interactive white board as they conduct staff meetings. One principal mentioned a web-based site the teachers use to share lessons. Another principal shared how they themselves go into classrooms and model technology use for teachers on a regular basis.

More than half the principals discussed the need for providing a professional development model that allows for differentiated instruction since teachers have varying

knowledge of technology use. The principals all believed they provided general administrative support for teacher integration of technology by providing professional development to the teacher, corresponding the high-user teachers to new equipment as it was received, and providing financial support as best as possible to obtain new hardware and/or software. One principal stated, “Some teachers are able to use technology and feel comfortable with it, others are still trying to remember their logins for their emails; so you have to take it at different steps.” (Interviewee 2, Line 494) Another interviewee suggested, “People need to be coached or taught at the level they are at.” (Interviewee 10, Line 3072) This would allow for expert teachers to continue progressing while providing support to those hesitant of technology use. One interviewee remarked on a successful professional development experience. “The very best professional development that has been conducted in this building took place in the classroom with kids. I had someone come and model for the teacher and eventually weaned the teacher off the support, but I will be honest, this was time consuming and pretty costly for one on one instruction.” (Interviewee 7, Line 1853)

The principals interviewed were able to discuss a wide variety of examples illustrating technology integration. One principal remarked, “Personally, if I were in the classroom right now as a former tech teacher, I would want a Smart Board mounted in the front of the classroom with a digital projector hanging or mounted from the ceiling which is connected to my main teacher computer, as well as an audio sound system and document camera.” (Interviewee 2, Line 505) The various descriptions given by the interviewees represented a diverse account of principals’ reflections and answers. However, all principals agreed on the continued need for professional development and personnel support in promoting effective classroom practices as well as to aide student achievement efforts.

*Research question 5.* How important do Michigan Elementary Principals rate the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship?

The participants were asked to rate the level of importance of the three items measuring the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship. Their responses were summarized using descriptive statistics for presentation in Table 15.

Table 15

*Descriptive Statistics: Standard III – Productivity and Professional Practice – Importance*

I believe that a principal should:	Number	Mean	SD
7. Use current technology-based management systems to maintain personnel and student records.	279	6.12	1.28
8. Use email to communicate with at least two groups of stakeholders: teachers, parents, community, or peers.	280	6.54	.98
9. Use telecommunications and/or the school website to communicate and collaborate with others.	279	6.15	1.18
Standard III – Productivity and Professional Practice	280	6.27	.91

The mean scores for the three items on Standard III, productivity and professional practice, were above 6.00, indicating that the participants perceived these topics were very important. The mean of 6.27 (sd = .91) for the total score provided support that the principals and assistant principals considered this standard very important.

*Research question 6.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard III, productivity and professional practice?

The principals and assistant principals were asked to indicate if they were interested in professional development of each of the three items included in Standard III – Productivity and Professional Practice. The responses to these three items were summarized using frequency distributions for presentation in Table 16.

Table 16

*Frequency Distributions: Standard III – Productivity and Professional Practice – Interest in Professional Development*

I believe that a principal should:	Number	Percent
7. Use current technology-based management systems to maintain personnel and student records.		
Yes	124	47.9
No	135	52.1
Missing 21		
8. Use email to communicate with at least two groups of stakeholders: teachers, parents, community, or peers.		
Yes	61	23.8
No	195	76.2
Missing 24		
9. Use telecommunications and/or the school website to communicate and collaborate with others.		
Yes	90	34.9
No	168	65.1
Missing 22		

A total of 124 (47.9%) principals and assistant principals indicated an interest in professional development for using current technology-based management systems to maintain personnel and student records. Twenty-one participants did not provide a response to this question. Sixty-one (23.8%) participants indicated that they were interested in participating in professional development for using email to communicate with at least two groups of stakeholders: teachers, parents, community, or peers. Twenty-four participants did not provide a response to this question. Ninety (34.9%) participants were interested in professional development focusing on the use of telecommunications and/or the school website to

communicate and collaborate with others. Twenty-two participants did not provide a response to this question.

*Interview questions 5 and 6.* While survey items asked principals to identify the level of importance of productivity and professional practice specifically related to using technology-based management systems, using email to communicate with stakeholders, using telecommunications to communicate, interviews with principals provided further insight and examples of technology related leadership in Michigan schools. The interview results were consistent with survey results in that principals felt these were areas that they needed less professional development due to experiences in these areas in recent years. Every principal interviewed uses email to communicate with stakeholders. Six of ten principals used laptops throughout the day as they travel to meetings and appointments. Seven principals also are provided with a hand held device for calling, emailing, and viewing reports or retrieving student data files such as home phone numbers, schedules, and emergency contacts.

All principals discussed the varying ways technology is used for managerial tasks throughout the day including: communicating with colleagues, district personnel, and parents via email, using web-based secure sites to view data such as assessments and student information. One interviewee commented “technology is used in every part of this building on a daily basis for many facets.” (Interviewee 8, Line 2246) Principals indicated they used several different modes for communicating with teachers in regards to school business. All principals interviewed use email on a daily basis. One principal discussed use of a Blackboard site to gather and archive information throughout the school year while another principal discussed the use of a shared common folder for storing and sharing items within the school community. Four principals discussed the use of electronic calendars for scheduling meetings with teachers and the same principals commented on sending a weekly electronic agenda with the latest updates.



“Teachers submit personal day approval via a web- based system and submit work orders for repairs or requests for delivery via a web- based system” stated an interviewee.

One principal discussed the use of blogs or podcasts within the school environment. The same principal commented that they would like to soon get to the point where the teachers incorporate these ideas into classroom routines.

Five of ten interviewed principals (50 %) described the use of school web pages that were used to provide information regarding the school day, district events, and brief information about school staff and resources. Principals commented on that some but not all teachers used classroom web pages to post daily agendas and announcements.

Six principals indicating the use of a phone service in which the principal or a district administrator is able to record a message and send it out to the entire school community or district within just a few minutes. This service is often used for informing the community of upcoming events or reporting school closures.

All principals interviewed commented on the use of technology by their administrative assistants and office staff. Several examples included: registering students into an electronic student data base, uploading immunization records, schedule events on a master district calendar, report students absences, check payroll updates, and order supplies on-line. One principal discussed the Point-of-Sale (POS) software that is used at lunch time to verify student access to lunch funds or credits. Parents can upload money to the system and students never have to carry cash or checks to school. One principal said, “I think that right now with the way that school systems are designed, technology is an integral piece of managing daily tasks of a building.” (Interviewee 4, Line 1332)

*Research question 7.* How important do Michigan Elementary Principals rate the NETS-A related to Standard IV, support, management, and operations, to the job of the principalship?

The participants were asked to rate the importance of three items related to Standard IV – support, management, and operations to the job of the principalship. The responses were summarized using descriptive statistics for presentation in Table 17.

Table 17

*Descriptive Statistics: Standard IV – Support, Management, and Operations – Importance*

I believe that a principal should:	Number	Mean	SD
10. Provide school-wide technology professional development for sharing ideas and resources.	279	5.88	1.21
11. Allocate discretionary funds/resources to advance implementation of the school technology plan.	274	5.57	1.25
12. Advocate for adequate, timely, and high-quality technology support services.	278	6.10	1.16
Standard IV – Support, Management, and Operations	279	5.85	.93

The mean score of 5.85 (sd = .93) for Standard IV – support, management, and operations was indicative that principals and assistant principals considered the three items included on this standard were important. The mean scores on each of the individual items were an indication that the participants considered each of these items to be important.

*Research question 8.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard IV, support, management, and operations?

The participants were asked to indicate their interest in professional development for the three items related to the Standard IV, support, management, and operations. Frequency distributions were used to summarize their responses. Table 18 presents results of this analysis.

Table 18

*Frequency Distributions: Standard IV: Support, Management, and Operations – Interest in Professional Development*

Interest in Professional Development	Number	Percent
10. Provide school-wide technology professional development for sharing ideas and resources.		
Yes	136	52.7
No	122	47.3
Missing 22		
11. Allocate discretionary funds/resources to advance implementation of the school technology plan.		
Yes	72	29.4
No	173	70.6
Missing 35		
12. Advocate for adequate, timely, and high-quality technology support services.		
Yes	63	24.4
No	195	75.6
Missing 22		

The majority of the principals and assistant principals (n = 136, 52.7%) reported they would be interested in school-wide technology professional development for sharing ideas and resources. Twenty-two participants did not provide a response to this question. In contrast, 72 (29.4%) of the principals and assistant principals were interested in professional development regarding allocation of discretionary funds/resources to advance implementation of the school technology plan. Thirty-five participants did not provide a response to this question. In regard to professional development to advocate for adequate, timely, and high-quality technology support services, 63 (24.4%) participants indicated an interest. Twenty-two participants did not provide a response to this question.

*Interview questions 7 and 8.* While survey items asked principals to identify the level of importance of support, management, and operations specifically related to providing school-wide professional development, allocating discretionary funds and resources for technology, and advocating for quality technology support, interviews with principals provided further insight and examples of technology based leadership in Michigan schools.

All principals interviewed discussed the use of either district support personnel or an on-line management system to track technology service requests. All principals rely on technology savvy staff to help trouble shoot problems before calling on district personnel. “We have four or five key technology leaders in the building where I can call on to help other teachers who might be struggling or might just have questions.” (Interviewee 5, Line 1495)

All principals interviewed discussed the concern that all the amount of technology within the building has increased that technology support, particularly support staff has decreased due to budget constraints. Providing necessary technology support and resources is managed by principals in a variety of ways including: district fund allocations, passing bonds within the school community, grants, community sponsors, and fundraisers. One interviewee commented that the recent bond issue was focused on “providing technology for student instruction.” (Interviewee 1, Line 328) Another principal shared their plan for creating a 21<sup>st</sup> Century School by providing each student and teacher in the district with a laptop. The same principal discussed the possibility of using their district bond funds to help make significant gains in achieving this goal. “There is not a lot of money out there in general funds, as you know, or anyplace else to use for technology, so you pretty much are having to go to bond money...” The researcher noted several times during interviewees that amount of discussion that was had on the budget constraints. The economic state leading to these discussions is perceived by the interviewee to be a key influence in the results of research question 8.

However, one principal described their recent achievement of supplying each classroom in the building with an interactive white board. Several funding sources were combined to complete this task over a two year period. The principal commented that “We looked at every avenue to get money and even the children collected and brought in enough change to buy a board too.” (Interviewee 9, Line 2895)

A common theme amongst all principals is that they were each very interested in seeking additional support, resources, and funding for implementing future technology endeavors. All principals advocated the need for additional technology support for their schools. “People forget that technology implementation is not just about putting computers in every classroom. It also means providing sustained funding for maintenance, for upgrades to software, for ongoing professional development, and substitutes for teachers to be out of the classroom for trainings.” (Interviewee 10, Line 3211)

Current technology support, although minimal in some instances, was provided in several ways. Intermediate school district support, district staff, building or grade level leaders, media specialists (librarians), and principal themselves offered support when possible. One district described their recent partnership with Mac Professionals to help with the implementation of technology initiatives. Another principal commented on their use of parent volunteers that they recruited to help support the technology needs in the building. The parents recruited have experience in working with technology.

*Research question 9.* How important do Michigan Elementary Principals rate the NETS-A related to Standard V, assessment and evaluation, to the job of the principalship?

The three items that were included on Standard V, assessment and evaluation were rated by principals and assistant principals regarding their importance to the job of the principalship. The responses were summarized using descriptive statistics for presentation in Table 19.

Table 19

*Descriptive Statistics: Standard V – Assessment and Evaluation - Importance*

I believe that a principal should:	Number	Mean	SD
13. Promote and model technology use analyzing data improving student learning and productivity.	279	6.37	1.08
14. Guide teacher professional development toward individual growth in technology.	279	5.75	1.24
15. Include effective technology use as one criterion in assessing performance of instructional staff.	279	5.32	1.47
Standard V – Assessment and Evaluation	279	5.81	1.05

The mean score for the principals and assistant principals indicated that the three items measuring assessment and evaluation ( $m = 5.81$ ,  $sd = 1.05$ ) were considered important. Item 13, promote and model technology use analyzing data improving student learning and productivity ( $m = 6.37$ ,  $sd = 1.08$ ) was considered most important. Item 15, include effective technology use as one criterion in assessing performance of instructional staff ( $m = 5.32$ ,  $sd = 1.47$ ), was considered least important.

*Research question 10.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard V, assessment and evaluation?

The principals and assistant principals were asked to indicate their interest in attending professional development on the three items included in Standard V, assessment and evaluation. The responses were summarized using frequency distributions for presentation in Table 20.

Table 20

*Frequency Distributions: Standard V: Assessment and Evaluation – Interest in Professional Development*

Interest in Professional Development	Number	Percent
13. Promote and model technology use analyzing data improving student learning and productivity.		
Yes	161	61.5
No	101	38.5
Missing 18		
14. Guide teacher professional development toward individual growth in technology.		
Yes	122	47.1
No	137	52.9
Missing 21		
15. Include effective technology use as one criterion in assessing performance of instructional staff.		
Yes	100	38.9
No	157	61.1
Missing 23		

The majority of participants (n = 161, 61.5%) reported they were interested in professional development to promote and model technology use analyzing data improving student learning and productivity. Eighteen participants did not provide a response to this item. When participants were asked if they were interested in professional development to guide teacher professional development toward individual growth in technology, 122 (47.1%) indicated yes. Twenty-one principals and assistant principals did not respond to this item. One hundred (38.9%) participants indicated they were interested in professional development that included effective technology use as one criterion in assessing performance of instructional staff. Twenty-three participants did not provide a response to this item.

*Interview questions 9 and 10.* While survey items asked principals to identify the importance of assessment and evaluation as it relates to modeling technology use for analyzing student data, guiding professional development towards individual growth, and assessing technology performance of instructional staff, interviews with principals provided further insight

and examples of technology leadership in Michigan schools. Principals interviewed occasionally facilitated professional development for staff and/ or modeled the use of technology to analyze data. Two principals commented on their use of the technology to highlight data during staff meetings. All principals recognized the use of on-line data warehouses to collect and analyze student performance data. Principals modeled uses of technology as they provided weekly updates via email to staff, updated master calendars electronically, and some even provided in class modeling of technology integrated lessons. No principals mentioned the use of wikis, blogs, or podcasts to lead building staff initiatives.

Six out of ten principals interviewed stated that technology was not yet included in annual teacher evaluations but the need to do so is present. However, no principals commented on their willingness to participate in professional development in order to facilitate such an initiative. Eight of ten principals interviewed stated they do expect technology integration within the classrooms as they make informal visits or walkthroughs of the classrooms. “I do look for technology use, see where teachers are, much like when you are assessing the kids to see where their level is in reading, you can assess the staff and see what their levels of technology comfort are and where and when they are using it” (Interviewee 2, Line 594). Another principal commented “I don’t want teachers to integrate technology for the sake of having it there, but rather it should be integrated into lessons so that the benefits of it result in increased student achievement” (Interviewee 7, Line 1913). All principals commented that technology should be included in teacher evaluations. One principal shared “ If you are not assessing it, or evaluating it, then it is always going to be one of those things that people would say, “Well, why do I need to use that?” (Interviewee 3, Line 1084).

All 10 principals commented on how essential that technology is to their school improvement plan. “Technology helps us monitor the progress that we are making towards our



achievement in our school improvement plan” (Interviewee 4, Line 1345). Another principal remarked, “collecting data for the purpose of school improvement plans and gathering information on how students are progressing has become an operational norm for us” (Interviewee 7, Line 1907). The discussion of data in regards to using technology for school improvement purposes was continuous throughout all ten principal interviews and was revisited on several occasions throughout most interviews.

*Research question 11.* How important do Michigan Elementary Principals rate the NETS-A related to Standard VI, social, legal, and ethical issues, to the job of the principalship?

The principals and assistant principals were asked to rate the importance of three items measuring Standard VI, social, legal, and ethical issues, to the job of the principalship. Their responses were summarized using descriptive statistics for presentation in Table 21.

Table 21

*Descriptive Statistics: Standard VI – Social, Legal, and Ethical Issues - Importance*

I believe that a principal should:	Number	Mean	SD
16. Secure and allocate technology resources to enable teachers to meet the needs of all learners.	277	5.91	1.28
17. Enforce an “Acceptable Use Policy” and other policies related to security, copyright, and technology use.	279	6.06	1.43
18. Participate in planning a focus on healthy and safe practices related to technology use.	279	5.57	1.44
Standard VI – Social, Legal, and Ethical Issues	279	5.84	1.14

The principal and assistant principal ratings for the three items included on Standard VI, social, legal, and ethical issues, provided evidence that the respondents considered these items important to very important in their positions. The mean score of 6.06 (sd = 1.43) for item 17, enforce an “Acceptable Use Policy” and other policies related to security, copyright, and

technology use, provide evidence that principals and assistant principals considered it the most important of the three items. Item 18, participate in planning a focus on healthy and safe practices related to technology use ( $m = 5.57$ ,  $sd = 1.44$ ) was the least important of the three items.

*Research question 12.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard VI, social, legal, and ethical issues?

Principals and assistant principals were asked to indicate if they would participate in professional development for the three items included in Standard VI, social, legal, and ethical issues. Their responses were summarized using frequency distributions. Table 22 provides the results of this analysis.

Table 22

*Frequency Distributions: Standard VI – Social, Legal, and Ethical Issues – Interest in Professional Development*

I believe that a principal should:	Number	Percent
16. Secure and allocate technology resources to enable teachers to meet the needs of all learners.		
Yes	120	46.9
No	136	53.1
Missing 24		
17. Enforce an “Acceptable Use Policy” and other policies related to security, copyright, and technology use.		
Yes	52	20.2
No	205	79.8
Missing 23		
18. Participate in planning a focus on healthy and safe practices related to technology use.		
Yes	76	29.8
No	179	70.2
Missing 25		

The principals and assistant principals ( $n = 120$ , 46.9%) indicated they were interested in professional development to secure and allocate technology resources to enable teachers to meet

the needs of all learners. Twenty-four participants did not provide a response to this item. Fifty-two (20.2%) participants indicated an interest in professional development to enforce an “Acceptable Use Policy” and other policies related to security, copyright, and technology use. Twenty-three participants did not provide a response to this item. When asked if they were interested in professional development for planning a focus on healthy and safe practices related to technology use, 76 (29.8%) indicated yes. Twenty-five participants did not provide a response to this question.

*Interview questions 11 and 12.* While survey items asked principals to identify the level of importance of social, legal, and ethical issues related to securing technology resources to meet the needs of all learners, enforcing policies related to security and copyright, and planning a focus on safe technology practices, interviews with principals provided further insight and examples of technology leadership in Michigan schools. Every principal interviewed described having a district-wide acceptable use policy for both students and staff. Similar to the survey results, every principal interviewed discussed the importance of providing technology that is used for educational purposes only. Each principal commented on the possible consequences for disobeying the rules and consequences which ranged from a loss of privilege to use the school’s informational technology resources for a designated time to providing evidence of crime by a student or any other person to law enforcement.

All principals interviewed described some means of internet filter system that is purchased by the district to help teachers and administrators police what students are viewing. “The district does a very good job with the screening software selected that helps keep a lot of inappropriate things out of kids view, but a lot of it comes back to teacher monitoring” (Interviewee 2, Line 630). Although a legal requirement for elementary schools, every principal interviewed reconfirmed the importance of providing filtering to protect students’ best interest.

In addition, all principals stated that staff also sign acceptable use policies, most often when they are hired. The same interviewee also remarked, “All teachers have signed a technology use policy and it is reviewed and enforced yearly” (Interviewee 2, Line 635). Two of 10 principals interviewed stated that they personally reiterate this policy at a staff meeting at least one per school year. Furthermore, the same two principals discussed the importance of reminding staff about acceptable use of school email accounts.

Several principals interviewed stated the importance of teaching students and teachers about copyright laws. “In terms of copyright, students who are doing research based things in upper elementary grades specifically are taught what are the issues of plagiarism and what you can use from a website and what you cannot use, like how you cannot copy pictures. Those are everyday practices in our media center” (Interviewee 5, Line 1564). One principal commented that recently the teachers have had to address copyright in terms of music and video downloading for inclusion in projects that students are constructing for a class assignment.

Several principals interviewed stated that technology has made an impact on providing security and safety mechanisms for keeping the school community safe. Items mentioned in the principal interviews included: web cams at entrances and exits to the buildings and card-swipe machines that give access to staff only allowing them to enter the building without checking into the main office. “The only way we can get in is if you have access to a key or if you have a security card, so the teachers have access to come in and out all of the time, but it keeps us safe knowing who is in our building at all times” (Interviewee 1, Line 316). All principals interviewed referenced these items as district initiatives and informative and brief professional development would be relevant to learning about safety and security policies affected by emerging technologies including social networking and cyber bullying.

Principals interviewed recognized the increased problems that are arising at school because of internet and email use at home. For example, one principal mentioned the use of Facebook in regards to cyber bullying and name calling. Issues like this are punishable at school if they carry into the school environment. This has brought a new dimension of discipline into the schools and has begun to shape new policies and procedures that school districts and law enforcement agencies are dealing with. “Policies are changing constantly from cell phone use to bullying which now includes cyber bullying, etc. Policies emerge and change as we see technology change” (Interviewee 7, Line 1940). All principals commented that updates regarding policies with their district are necessary to learn about but substantial professional development on this topic was of least concern in relationship to the other areas.

### *Summary of Standards*

The responses for the importance of the items on the six standards were summarized using descriptive statistics. Table 23 presents results of this analysis.

Table 23

### *Descriptive Statistics: Summary of Standards- Importance*

NETS-A Standards:	Number	Mean	SD
Standard I – Leadership and Vision	280	5.85	1.01
Standard II – Learning and Teaching	280	6.27	.89
Standard III – Productivity and Professional Practice	280	6.27	.91
Standard IV – Support, Management, and Operations	279	5.85	.93
Standard V – Assessment and Evaluation	279	5.81	1.05
Standard VI – Social, Legal, and Ethical Issues	279	5.84	1.14

The mean scores for the six standards were consistent, ranging from 6.27 (sd =.89) for Standard II, learning and teaching to 5.81 (sd = 1.05) for Standard V, assessment and evaluation.

The principals indicated that all six standards were from important to very important in their positions as principals.

The number of principals indicating an interest in professional development on each of the six standards was summarized by averaging the positive responses. The results of this analysis are presented in Table 24.

Table 24

*Summary of Interest in Professional Development for NETS-A Standards*

NETS-A Standards:	Number	Percent
Standard I – Leadership and Vision	188	67.1
Standard II – Learning and Teaching	229	81.8
Standard III – Productivity and Professional Practice	144	51.4
Standard IV – Support, Management, and Operations	154	55.0
Standard V – Assessment and Evaluation	192	69.6
Standard VI – Social, Legal, and Ethical Issues	139	49.6

The majority of participants were interested in at least one type of professional development for all standards, except Standard VI – social, legal, and ethical issues (n = 139, 49.6%). The greatest number of principals and assistant principals (n = 229, 81.8%) were interested in professional development for Standard II - learning and teaching.

### **Ancillary Findings**

Additional statistical analysis was completed on the importance of the six NETS-A standards to determine if the responses varied by the time spent in technology-related professional development, taking an online course, and geographic location of the school. A one-way multivariate analysis of variance (MANOVA) was used to compare the responses on the

importance of the six NETS-A standards by the time spent in technology-related professional development. Table 25 presents results of this analysis.

Table 25

*One-way Multivariate Analysis of Variance – Importance of NETS-A Standards by Time Spent in Technology-Related Professional Development*

Hotelling's Trace	F Ratio	DF	Sig	Effect Size
.08	1.14	18, 788	.311	.03

The Hotelling's trace of .08 obtained on the one-way MANOVA comparing the importance of the six NETS-A standards by the length of time spent in technology-related professional development was not statistically significant,  $F(18, 788) = 1.14$ ,  $p = .311$ ,  $d = .03$ . This result indicated that the principals did not differ in their perceptions of the importance of the six NETS-A standards by the length of time spent in technology-related professional development. To further examine the lack of statistically significant differences, descriptive statistics were obtained for each of the standards. Table 26 presents results of this analysis.

Table 26

*Descriptive Statistics – Importance of NETS-A Standards by Time Spent in Technology-Related Professional Development*

Standard	Number	Mean	SD
<b>Standard I – Leadership and Vision</b>			
Less than 1 hour	27	5.81	1.03
Between 1 and 4 hours	121	5.76	.99
Between 5 and 10 hours	71	5.85	1.10
11 hours or more	54	6.06	.96
<b>Standard II – Learning and Teaching</b>			
Less than 1 hour	27	6.15	.90
Between 1 and 4 hours	121	6.23	.79
Between 5 and 10 hours	71	6.28	.98
11 hours or more	54	6.41	.98
<b>Standard III – Productivity and Professional Practice</b>			
Less than 1 hour	27	6.36	.95
Between 1 and 4 hours	121	6.24	.77
Between 5 and 10 hours	71	6.30	1.06
11 hours or more	54	6.23	1.01
<b>Standard IV – Support, Management, and Operations</b>			
Less than 1 hour	27	5.94	1.16
Between 1 and 4 hours	121	5.83	.84
Between 5 and 10 hours	71	5.88	.94
11 hours or more	54	5.80	1.02
<b>Standard V – Assessment and Evaluation</b>			
Less than 1 hour	27	5.51	1.21
Between 1 and 4 hours	121	5.77	1.01
Between 5 and 10 hours	71	5.97	1.03
11 hours or more	54	5.85	1.10
<b>Standard VI – Social, Legal, and Ethical Issues</b>			
Less than 1 hour	27	5.64	1.24
Between 1 and 4 hours	121	5.82	1.04
Between 5 and 10 hours	71	5.86	1.23
11 hours or more	54	6.01	1.15

The comparison of the mean scores for the importance of the six NETS-A standards support the nonsignificant findings on the MANOVA. Based on these findings, it appears that



perceptions of the importance of the standards do not differ by the length of time that principals participated in technology-related professional development.

The interest in participating in professional development related to the six NETS-A standards were compared by the length of time participating in technology-related professional development using Kruskal-Wallis one-way analysis of variance (ANOVA). The results of this analysis are presented in Table 27.

Table 27

*Kruskal-Wallis One-way Analysis of Variance – Interest in Participation in Professional Development Associated with NETS-A Standards by Time Spent in Technology-Related Professional Development*

Standard	Number	Mean Rank	Chi-Square	Sig
<b>Standard I – Leadership and Vision</b>				
Less than 1 hour	27	134.78	2.09	.555
Between 1 and 4 hours	122	140.16		
Between 5 and 10 hours	71	128.32		
11 hours or more	55	147.30		
<b>Standard II – Learning and Teaching</b>				
Less than 1 hour	27	143.80	1.44	.695
Between 1 and 4 hours	122	142.34		
Between 5 and 10 hours	71	134.73		
11 hours or more	55	129.74		
<b>Standard III – Productivity and Professional Practice</b>				
Less than 1 hour	27	147.11	1.15	.765
Between 1 and 4 hours	122	140.56		
Between 5 and 10 hours	71	135.73		
11 hours or more	55	130.78		
<b>Standard IV – Support, Management, and Operations</b>				
Less than 1 hour	27	145.48	.92	.821
Between 1 and 4 hours	122	139.44		
Between 5 and 10 hours	71	138.68		
11 hours or more	55	130.25		
<b>Standard V – Assessment and Evaluation</b>				
Less than 1 hour	27	133.65	.95	.812
Between 1 and 4 hours	122	139.95		
Between 5 and 10 hours	71	142.32		
11 hours or more	55	130.23		
<b>Standard VI – Social, Legal, and Ethical Issues</b>				
Less than 1 hour	27	144.83	.57	.569
Between 1 and 4 hours	122	136.93		
Between 5 and 10 hours	71	140.75		
11 hours or more	55	133.48		

The results of the Kruskal-Wallis one-way ANOVAs were not statistically significant. These findings provided support that interest in participating in professional development for the six NETS-A standards did not differ by the length of time the principals and assistant principals had participated in technology-related professional development.

A one-way MANOVA was used to test the importance of the six NETS-A standards by participation in an online course. The results of this analysis are presented in Table 28.

Table 28

*One-way Multivariate Analysis of Variance – Importance of NETS-A Standards by Participating in an Online Course*

Hotelling's Trace	F Ratio	DF	Sig	Effect Size
.01	.30	6, 262	.936	.01

The Hotelling's trace of .01 produced by the one-way MANOVA comparing the importance of NETS-A standards between participants who had taken an online course and those who had not been in this type of course was not statistically significant,  $F(6, 262) = .30$ ,  $p = .936$ . This result indicated that perceptions of the importance of NETS-A Standards did not differ between principals' and assistant principals' participation in online courses. To further investigate this lack of statistically significant differences, descriptive statistics were obtained for the six NETS-A standards. Table 29 presents results of this analysis.

Table 29

*Descriptive Statistics – Importance of NETS-A Standards by Participation in an Online Course*

Standard	Number	Mean	SD
Standard I – Leadership and Vision			
Took an online course	138	5.90	1.03
Did not take an online course	131	5.78	1.00
Standard II – Learning and Teaching			
Took an online course	138	6.28	.94
Did not take an online course	131	6.25	.85
Standard III – Productivity and Professional Practice			
Took an online course	138	6.28	.97
Did not take an online course	131	6.27	.86
Standard IV – Support, Management, and Operations			
Took an online course	138	5.84	.97
Did not take an online course	131	5.85	.88
Standard V – Assessment and Evaluation			
Took an online course	138	5.84	1.11
Did not take an online course	131	5.78	1.00
Standard VI – Social, Legal, and Ethical Issues			
Took an online course	138	5.89	1.16
Did not take an online course	131	5.80	1.11

The comparison of the mean scores for the six NETS-A standards did not differ between principals and assistant principals who had taken an online course and those who had not completed this type of course. These findings supported the lack of statistically significant differences on this analysis.

The responses regarding interest in attending professional development for the six NETS-A standards were compared between participants who had attended an online course and those who had not attended this type of course using Mann-Whitney test for two independent samples. The results of this analysis are presented in Table 30.

Table 30

*Mann-Whitney Test for Two Independent Variables – Interest in Participation in Professional Development Associated with NETS-A Standards by Participation in an Online Course*

Standard	Number	Mean Rank	Z	Sig
Standard I – Leadership and Vision				
Took an online course	140	135.12	-.94	.348
Did not take an online course	131	136.94		
Standard II – Learning and Teaching				
Took an online course	140	140.17	-.30	.766
Did not take an online course	131	131.55		
Standard III – Productivity and Professional Practice				
Took an online course	140	134.74	-1.15	.250
Did not take an online course	131	137.35		
Standard IV – Support, Management, and Operations				
Took an online course	140	131.08	-.11	.912
Did not take an online course	131	141.26		
Standard V – Assessment and Evaluation				
Took an online course	140	132.93	-.69	.490
Did not take an online course	131	139.28		
Standard VI – Social, Legal, and Ethical Issues				
Took an online course	140	134.82	-.28	.782
Did not take an online course	131	137.26		

The results of the comparison of interest in professional development in the six NETS-A standards between participants who had attended an online course and those who had not taken this type of course were not statistically significant. Based on these findings, it appears that taking an online course was not contributing to statistically significant differences in interest in professional development.

The location of the school (rural, suburban, and urban) was used as the independent variable in a one-way multivariate analysis of variance. The dependent variables in this analysis were the mean scores for the six NETS-A standards. Table 31 presents results of this analysis.

Table 31

*One-way Multivariate Analysis of Variance – Importance of NETS-A Standards by Location of the School*

Hotelling's Trace	F Ratio	DF	Sig	Effect Size
.06	1.26	12, 518	.241	.03

The Hotelling's trace of .06 obtained on the comparison of the importance of NETS-A standards among rural, suburban, and urban schools was not statistically significant,  $F(12, 518) = 1.26$ ,  $p = .241$ ,  $d = .03$ . This result indicated that principals and assistant principals in schools located in the three geographical areas were similar in their perceptions of the importance of the NETS-A standards. Descriptive statistics were obtained for the six standards by the location of the school to examine the lack of statistically significant differences. Table 32 presents results of this analysis.

Table 32

*Descriptive Statistics – Importance of NETS-A Standards by Geographic Location of the School*

Standard	Number	Mean	SD
Standard I – Leadership and Vision			
Rural	95	5.82	1.05
Suburban	133	5.85	1.02
Urban	40	5.90	1.00
Standard II – Learning and Teaching			
Rural	95	6.23	.89
Suburban	133	6.29	.95
Urban	40	6.23	.70
Standard III – Productivity and Professional Practice			
Rural	95	6.22	.85
Suburban	133	6.30	1.00
Urban	40	6.28	.78
Standard IV – Support, Management, and Operations			
Rural	95	5.68	.99
Suburban	133	5.96	.88
Urban	40	5.89	.92
Standard V – Assessment and Evaluation			
Rural	95	5.65	1.07
Suburban	133	5.89	1.10
Urban	40	5.95	.83
Standard VI – Social, Legal, and Ethical Issues			
Rural	95	5.64	1.10
Suburban	133	5.90	1.0
Urban	40	6.12	.93

The mean scores for the participants' perceptions on the importance of the six NETS-A standards were similar across the three geographic locations. On a scale of 1 to 7, with 7 indicating the great importance, the scores were between 5.5 and 6.30, providing support of the importance of these standards.

The responses on the participants' interest in professional development for the six NETS-A standards were compared by geographic location using Kruskal-Wallis one-way analysis of variance. Results of this analysis are presented in Table 33.

Table 33

*Kruskal-Wallis One-way Analysis of Variance – Interest in Participation in Professional Development Associated with NETS-A Standards by Geographic Location of the School District*

Standard	Number	Mean Rank	Chi Square	Sig
Standard I – Leadership and Vision				
Rural	96	127.44	2.58	.275
Suburban	134	137.03		
Urban	40	149.73		
Standard II – Learning and Teaching				
Rural	96	136.87	.61	.739
Suburban	134	132.54		
Urban	40	142.13		
Standard III – Productivity and Professional Practice				
Rural	96	125.73	4.85	.088
Suburban	134	136.47		
Urban	40	155.70		
Standard IV – Support, Management, and Operations				
Rural	96	132.82	2.53	.282
Suburban	134	132.34		
Urban	40	152.53		
Standard V – Assessment and Evaluation				
Rural	96	133.49	.12	.942
Suburban	134	136.25		
Urban	40	137.81		
Standard VI – Social, Legal, and Ethical Issues				
Rural	96	130.42	2.11	.349
Suburban	134	134.81		
Urban	40	150.00		

The differences in principals' interest in participation in the six NETS-A standards by geographic area were not statistically significant. These findings indicate that principals in the three geographic regions (rural, suburban, and urban) did not differ in their interests to participate in professional development for the six NETS-A standards.



### **Summary**

The results of the statistical analysis of the quantitative data and the content analysis of the qualitative interviews have been presented in this chapter. The results included data collected from the Survey of Technology Experiences (Billheimer, 2007) and the data gathered from interviews with principals recognized by the Michigan Intermediate School Districts as effective technology leaders. The National Educational Technology Standards for Administrators (NETS-A) were imperative to the development of the survey instrument as well as to the questions used in the interviews. Conclusions and recommendations based on these findings and the review of literature can be found in Chapter V.

## CHAPTER 5

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

With the emergence of new technologies in today's classroom, the purpose of this study was to analyze the extent to which elementary principals employ behaviors that support their roles as technology instructional leaders. The framework of the National Educational Technology Standards for Administrators (NETS-A) from the International Society for Technology in Education (ISTE) was used in this study.

The NETS-A are a national consensus of educational stakeholders regarding what best indicates effective school leadership for comprehensive and appropriate use of technology in schools. These standards have been adopted by the ISTE. The NETS-A consists of six standards related to: (a) leadership and vision; (b) learning and teaching; (c) productivity and professional practice; (d) support, maintenance, operations, and finance; (e) assessment and evaluation; and (f) social, legal, and ethical issues (ISTE, 2002).

As issues concerning the lack of systemic change in school reform and technology integration persist, little research and discussion has been published concerning the extent to which technology leadership behaviors identified in the NETS-A standards are being implemented in schools. This study demonstrates how Michigan elementary principals adapt to the introduction and integration of new technology in their schools.

Through an initial letter requesting for participation, 770 Michigan K-6 public school principals were asked to complete the *Survey of Technology Experiences* consisting of 18 closed-ended items developed from the six standards of leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. Each principal was asked to rate the level of

importance for each statement in relation to their own position. Additional items on the survey were related to interest in professional development. Demographic data also were collected.

Ten Michigan elementary school principals from a variety of K-6 public school districts were identified for in-depth interviews. Technology directors at each of the Intermediate School Districts across Michigan identified principals who were effective technology leaders in the geographical region based on the *Profiles for Technology-Literate Administrators*. This profile was developed based on the ISTE National Educational Technology Standards (NETS-A) and Performance Indicators for Administrators. The identified participants participated in in-depth interviews to obtain information on their training and practice for technology leadership.

This chapter includes a summary of how Michigan Elementary Principals adapt to the introduction and integration of new technology in their schools. Conclusions are presented regarding principals' perceptions of the importance of the NETS-A, interests in professional development, and implementation of the technology standards. Implications and recommendations for further study derived from the findings on the "Survey of Technology Experiences" (Billheimer, 2007) and interviews with principals are also presented in this chapter.

### ***Methods***

This mixed methods study used quantitative methods to examine Michigan elementary principals' perceptions of the importance of the NETS-A standards to the role of the principalship and to determine their interest in professional development related to these standards. Qualitative methods were used to describe the implementation of the NETS-A standards by Michigan elementary principals who were identified as effective technology leaders. The survey, "Survey of Technology Experiences" (Billheimer, 2007), was distributed to a random sample of 770 Michigan principals. Of this number, 280 returned their completed surveys for a response rate of 36.4%. The principals' rated the level of importance of the items

from the six standards of the NETS-A using a Likert-type scale ranging from 1 to 7, with a 1 indicating Not Important, 4 indicating Important, and 7 indicating Very Important. Three questions were developed for each of the six standards for a total of 18 items. The principals also were asked to indicate their interest in professional development by answering “yes” or “no” for each of the 18 items that measured the six standards of the NETS-A. Demographic data also were collected including: number of years of experience in education, current position, number of years at current school in present position, participants’ highest educational level, gender, age, and participation in professional development in regards to technology. The qualitative data were obtained from 10 interviews that were conducted either face-to-face or via telephone with Michigan elementary school principals identified by local intermediate school district technology personnel as effective technology leaders in their geographical region based on the *Profiles for Technology-Literate Administrators* (ISTE; 2002). The identified participants were entered into a MS Excel list and randomly selected and invited to participate. The interviews were audio taped and transcribed for analysis.

Statistical analyses included frequency distributions to determine the extent to which principals perceived the standards were important and their interest in participating in professional development. In addition, inferential statistical analyses were used to determine if any significance existed between the principals’ perceptions of level of importance and demographic data. The qualitative data were analyzed using content analysis to determine emergent patterns and trends in the interviews. Multivariate analysis of variance (MANOVA) and Kruskal-Wallis one-way analysis of variance (ANOVA) were used to compare responses on the survey by selected demographic data. The results of the content analysis were included in Chapter IV with the qualitative data for each research question.

### ***Demographics***

The population of the study consisted of approximately 2,000 Michigan principals. The random sample was selected from the Michigan Department of Education database of 2009-2010 principals and assistant principals. Elementary was defined as a school servicing a least kindergarten through sixth grades or some combination thereof. Participants were preferably certified in K-8 or K-12 administration. Of the 770 participants who were asked to complete the *Survey of Technology Experiences*, 280 returned the survey representing a 36.4% response rate.

Ten principals representing various geographic regions of the state, various grade levels, and genders were interviewed from the list of principals recommended as effective technology leaders by local intermediate school district technology personnel as effective technology leaders based on the Profiles for Technology-Literate Administrators (ISTE, 2002). The identified participants were entered into a MS Excel list and randomly selected and invited to participate.

### **Discussion**

This section presents the findings and conclusions based on the results of the data analysis of the *Survey of Technology Experiences* (Billheimer, 2007). Descriptive statistics of all data were reported in Chapter 4 along with the qualitative analysis from the semi-structured interviews. The qualitative analysis provided a description of implementation of the NETS-A by Michigan elementary principals who were identified as effective technology leaders by technology directors or support staff at intermediate school districts within Michigan. Statistical analyses revealed numerous similarities within implementation of some standards and a vast diversity in implementation of other standards. All principals interviewed were familiar with administrative tasks using technology (e.g., spreadsheets, and word processing). All respondents indicated they routinely used email, with 89.7% of principals and assistant principals routinely doing work-related technology activities from home. More specifically, 12 research questions,

two for each NETS-A standard, were developed for this study. Each set of questions is summarized by NET-A standards:

*Standard I, Leadership and Vision*

*Research question 1.* How important do Michigan Elementary Principals rate the NETS-A related to Standard I, leadership and vision, to the job of the principalship?

*Research question 2.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard I, leadership and vision?

The survey and interview questions asked in regards to Standard I took into consideration that educational leaders should inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision (ISTE, 2002). According to the ISTE Principal Performance Profiles for Technology Literate Principals (2002), principals who integrate technology effectively in their buildings typically perform several tasks related to this standard:

- Effective principals participate in an inclusive district process through which stakeholders formulate a shared vision that defines expectations for technology use.
- Effective principals develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan.
- Effective principals promote highly effective practices in technology integration among their staff (ISTE, 2002)

The principals and assistant principals participating in the survey, considered Standard I- Leadership and Vision to be important. Interviews produced similar results with each interview commenting on a vision for the school to make progress in technology usage related to their current situation. This data were consistent with the conclusions of Project Tomorrow (2009),

with district administrators (90%) and principals (92%) reporting that effective implementation of instructional technology is important or extremely important to their vision.

All of the principals interviewed commented that their personal vision for technology use in their school had been influenced by the implementation of data warehouses that have led the charge for professional learning communities over the past year. As indicated in the literature review, effectively using technology empowers administrators to manage large amounts of information and make data-driven decisions. Every principal interviewed discussed in depth about the continued push to look at the types of instruction currently in place, what are the trends for the future based on current data, and how technology could support implementation of new programs within schools. School districts are beginning to transform the way they perform business by using data and assessment management systems that allow for more timely access to multiple sources of data (e.g., state reports, assessments, and student demographic information). Although data management systems have several uses, the most common and frequently used applications are accessing student test scores and profile information. If given the time and training, school educators could begin using these technology-based management systems by combining multiple data types over time to begin transforming schools into professional learning communities where teachers, principals and support staff share best practices and pinpoint what instructional strategies work and which are not effective.

Over three quarters of the principals interviewed discussed using the technology to establish or maintain the development and facilitation of collaborative groups or data grade level or building teams that work to improve student learning. This process is known to be a critical step in relooking at the instructional practices in the classroom and the results of those practices. The technology has served as a vehicle to have conversations regarding progress monitoring student achievement as mentioned in several examples within the interviews.

All interviewees agreed that their roles as principals were instrumental in the facilitation of technology usage within their school buildings. The personal vision of each of these principals was unique, but included a variety of common elements including: integration of technology into instruction, providing technology as a visual support for students, making technology a vehicle for enhanced communication with the school community, providing sustained and on-going professional development of emerging technologies, and collecting data to ensure individual growth based on student need. Although principals could discuss their vision they had for technology integration in schools, no principals had written documentation of a collaborative vision within the district or building technology plan.

As noted in the literature, the Collaborative for Technology Standards for School Administrators (TSSA, 2001) suggested school administrators take on the responsibility of “Inspiring a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision” (p. 6). Technology integrated with leadership could result in the changes required to meet 21<sup>st</sup> Century demands. “For public education to benefit from the rapidly evolving development of information and communication technology, leaders at every level – school, district, and state – must not only supervise, but provide informed, creative and ultimately transformative leadership for systemic change” (*Toward a New Golden Age*, 2004, p. 15).

All 10 principals also actively worked to seek resources to move the school forward in terms of using data to guide instruction by providing equipment and professional development to the best of their ability, staying within constraints of challenging economic times. There was deep concern by all principals that technology integration would come to a halt if they could not find the money for future technology initiatives and professional development especially in



regards to recent cuts for school spending and designation of school funding going to already-approved changes in State of Michigan legislation.

As indicated in the results, principals were willing to articulate a vision of how technology could produce instructional changes as a critical element in leadership. Although issues of time, funds, and lack of professional development were seen as a challenge, the vision that technologies could transform the way teachers teach and pupils learn was evident in both the quantitative and qualitative analyses.

*Standard II, Learning and Teaching*

*Research question 3.* How important do Michigan Elementary Principals rate the NETS-A related to Standard II, learning and teaching, to the job of the principalship?

*Research question 4.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard II, learning and teaching?

The greatest range in analyses of the qualitative and quantitative data appeared in Standard II, Learning and Teaching. The survey and interview questions asked in regards to Standard II took into consideration that educational leaders should ensure that curricular design, instructional strategies and learning environments integrate appropriate technologies to maximize teaching and learning (ISTE, 2002). Principals who effectively lead integration of technology typically perform several tasks in relationship to this standard:

- Effective principals can assist teachers in using technology to access, analyze, and interpret student performance data, and use results to design, assess, and modify student instruction appropriately.
- Effective principals can design, implement, support, and participate in collaborative professional development for all instructional staff that institutionalizes effective integration of technology for increased student achievement (ISTE, 2002).

Results of this study indicated that Michigan elementary principals' rate the level of importance of Standard II, learning and teaching, as high importance with a mean score of 6.27. Principals also articulated the highest interest in some form of professional development for the items in Standard II (81.8%). Even though Michigan elementary principals recognized the importance of technology in teaching and learning, the high interest in professional development indicated that principals were aware of a weakness in leadership capacity for using technology in teaching and learning.

The interpretations of technology integration expressed by principals during the interview process were diverse. When asked, "What would students be doing when teachers effectively integrated technology?" the principals who were interviewed provided a vast range of technology implementation in schools. Specific examples included the use of laptops, interactive white boards, Internet access, video conference equipment, and I-pods to be of most use within their classrooms as the present time. The use of wikis, blogs, or podcasts, were only discussed as important or necessary instructional practices in the context of one interview. These items were referred to as emerging technologies that only are incorporated by the few tech savvy teachers who learned the skills to incorporate such practices on their own merit. However, as the literature indicated, students growing up today have their own system of communication (Prensky, 2005) that involves instant messaging; sharing information through blogs; buying and selling on eBay; exchanging through peer-to-peer technology; creating with Flash; meeting in 3D worlds; collecting via downloading, coordinating, and collaborating through wikis; searching with Google; reporting via camera phones; programming; socializing in chat rooms; and learning via Web surfing. These tools are extensions of their brains (Tapscott, 2009).

As suggested in the literature, the role of the principal as instructional leader is critical and Michigan principals are aware of the importance of their role as indicated in this study's

findings. For example, technology is important for a diverse population of students, especially for those who lack access to computers at home. The use of assistive technology is extremely helpful for students with special needs. When teachers are developing individualized lesson plans, modifications or accommodations may be needed to the lessons for particular students. Curriculum adaptation may be required to aid struggling students with a particular concept or students who are doing well and need a more challenging curriculum. Technology can be a tool for teachers by providing multiple means of representation, engagement, and motivation.

The high level of interest in professional development by Michigan elementary principals indicates a willingness to construct the essential capacity to facilitate technology initiatives. With No Child Left Behind (NCLB), schools began to be held more accountable for the performance of their students on national and state assessments, and the principals' duties and responsibilities changed to accommodate the new mandates. Principals became more responsible for teaching and learning in their schools. In particular, their need to monitor instruction increased along with their responsibility to help teachers improve their teaching. The high rating of Standard II indicated that principals identified with the importance of promoting effective practices in technology integration so that students could learn to use higher-order thinking skills that could be used in a global learning environment. As Mehlinger and Powers (2002) stated, "It is no longer possible for administrators to be both naive about technology and be good school leaders" (p. 218). Principals of effective schools should be role models by setting positive examples for others to follow, especially technology use. The actions of the principal are routinely noticed and interpreted by others as "what is important."

Principals are beginning to understand that engaging the entire school staff in decision making could result in more commitment to school reform initiatives. However the amount of time spent on this task is still limited by certain restraints, such as: time management and

contract restrictions. To be successful, professional learning opportunities must begin to take shape within schools on a more consistent basis. Principals must take time to discuss technology plans with key stakeholders to promote meaningful teaching and learning within the classroom.

As noted by Lemke and Coughlin (1998):

The unique combination of what is known today about brain research and cognitive learning theory, combined with the high-speed networked computers that are slowly making their way into schools, presents educators with opportunities never before possible. The question is whether or not educators and the education system will act strategically enough to capitalize on this unique opportunity. (p. 8)

The results indicate that teachers need considerable support to integrate technology into the curriculum, including supportive leadership. Principals are looked at to provide ongoing opportunities for differentiated instruction for the vast range of technology literate staff within their buildings.

*Standard III, Productivity and Professional Practice*

*Research question 5.* How important do Michigan Elementary Principals rate the NETS-A related to Standard III, productivity and professional practice, to the job of the principalship?

*Research question 6.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard III, productivity and professional practice?

The survey and interview questions for Standard III took into consideration that educational leaders should apply technology to enhance their professional practice and to increase their productivity as well as that of others in their buildings (ISTE, 2002). Principals who lead integration of technology effectively typically perform several tasks related to this standard:

- Effective principals use current technology-based management systems to access and maintain personnel and student records.
- Effective principals tend to use a variety of media and formats, including telecommunications and the school website, to communicate, interact, and collaborate with the education community (ISTE, 2002).

Less than half of principals (47.9%) surveyed indicated they were interested in professional development for using current technology-based management systems to maintain personnel and student records. Fewer principals (23.8%) were interested in professional development for email communication purposes, with 90 (34.9%) participants were interested in professional development focusing on the use of telecommunications.

With the increased accountability to be instructional leaders, principals' priorities should be to provide staff development that can improve the rigor of instruction that ultimately is expected to raise the level of student achievement. These new expectations for principals have led school districts to rethink and adjust their paradigm concerning the role of the principal. Principals who participate in school-wide professional development on technology integration promote shared leadership for school improvement. All principals who were interviewed emphasized the importance of professional development in their schools and more than half the principals interviewed promoted shared leadership by participating in professional development with staff. However, most principals interviewed mentioned that tasks, such as emailing, now are routine daily occurrences and not seen as a need for further support.

Principals also commented that with the exception of data reporting for school improvement purposes, many managerial tasks (e.g., maintaining personnel files and telecommunication responsibilities) have been shifted to the office manager or administrative assistant. As reliance on technology continues to expand in schools, the role of the office staff

has greatly changed, with principals relying on their staff to perform duties, (e.g., writing and editing reports, answering e-mail, data entry, and managing the school website). Office automation and organizational restructuring have led secretaries, administrative assistants, or clerks to assume additional responsibilities that were once reserved for managerial and professional staff.

As far as needs for current or future professional development for their school staff, each principal had different perspectives. This information provides additional support regarding the principals' lack of interest in professional development for Standard III.

*Standard IV, Support, Management, and Operations*

*Research question 7.* How important do Michigan Elementary Principals rate the NETS-A related to Standard IV, support, management, and operations, to the job of the principalship?

*Research question 8.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard IV, support, management, and operations?

The survey and interview questions asked in regards to Standard IV took into consideration that educational leaders should ensure the integration of technology to support productive systems for learning and administration (ISTE, 2002). Principals who lead integration of technology effectively typically perform several tasks related to this standard:

- Effective principals provide school-wide staff development for sharing work and resources across commonly used formats and platforms.
- Effective principals allocated funds and other resources to advance implementation of the technology plan.

- Effective principals also advocate for adequate, timely, and high-quality technology support services (ISTE, 2002)

Principals surveyed in this study indicated that all three items included within this standard were important. These items included; providing school-wide professional development for the sharing of ideas and resources, allocating discretionary funds/ resources to advance implementation of the schools or district's technology plan, and advocating for adequate, timely, and high quality support services. In contrast to the importance revealed in Research Question 7, the responses to Research Question 8 suggested that a small percentage (29.4%) of the principals surveyed were interested in professional development on discretionary funding. A smaller percent (24.4%) of principals expressed an interest for professional development for technology support services. The lack of response and interest may suggest the frustration within the state of Michigan on school funding and the downfall of the state's economy.

As illustrated in the literature and confirmed in the interviews conducted with the 10 principals, many challenges are facing school principals regarding to technology integration. As principals and district administrators' work toward greater integration of technology into classroom instruction, their primary challenges include funding to acquire new technologies (55%) or update the technology infrastructure (45%), staff professional development (46%) and on-going technical support (32%). Schools and school districts need to continue making investments in technology, such as the "Speak Up Data" (Project Tomorrow, 2009); revealed new attitudes and values support the impact of technology on both the learner and the teachers. Project Tomorrow indicated that many teachers are using digital media tools (66%), digital resources (46%), and games (42%); but they lack access to mobile computers or devices for every student, as well as consistent, reliable Internet access in their classroom.

Furthermore, the management of technology infrastructure and support may be the implementation problem that has the potential to impact technology implementation negatively. The equipment that teachers and students are using needs to be easily accessible and dependable. Teachers need to be able to depend on technology as they build lesson plans and develop instruction without having to worry that their planning efforts and schedules will not be accessible because of equipment malfunctions or unavailability. A few negative experiences can lead teachers to believe that technology use is more problematic than helpful and as a result can be expected to reduce technology use in their classrooms. Principals, staff, teachers, and students should not be expected to be technology support experts, but rather, principals should be responsible for securing the reasonable technical and infrastructure support needed to encourage technology use within their buildings. As the results conclude, while each leader believed they demonstrated support when possible, there were differences in their technology skills and their vision of support about technology for each of their personal buildings.

*Standard V, Assessment, and Evaluation*

*Research question 9.* How important do Michigan Elementary Principals rate the NETS-A related to Standard V, assessment and evaluation, to the job of the principalship?

*Research question 10.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard V, assessment and evaluation?

The survey and interview questions asked regarding Standard V took into consideration that educational leaders should use technology to plan and implement comprehensive systems of effective assessment and evaluation (ISTE, 2002). Principals who effectively lead integration of technology typically perform several tasks in relationship to this standard:

- Effective principals promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity.



- Effective principals implement evaluation procedures for teachers that assess individual growth toward established technology standards and guide professional development planning.
- Effective principals include effectiveness of technology use in the learning and teaching process as one criterion in determining performance of instructional staff (ISTE, 2002).

In regards to Standard V, Assessment and Evaluation, principals' responses varied by the specificity the item. For example, Item 13, promote and model technology use analyzing data improving student learning and productivity was considered most important. In contrast, Item 15, include effective technology use as one criterion in assessing performance of instructional staff was considered least important. In interviews, principals continuously remarked that the use of technology in teacher formal evaluations was not a priority and most often was not a factor in performance. This finding could be a result of the likeliness that school leaders, in general, do not feel competent in evaluating teachers in the area of technology use. Another aspect of principals' behavior regarding evaluating teachers and technology is that approximately one-third of principals have taken a technology course (Whale, 2003), including graduate courses, as well as seminars, workshops, and professional in-services.

As with any educational intervention, the effectiveness of technology depends upon the appropriate selection and implementation of that technology to meet teaching and learning goals. Assessment and evaluation of performance is a characteristic of the newly drafted National Education Technology Plan (NETP) for both principals and teachers. However; few states have implemented this plan. The Principals Technology Leadership Assessment (PTLA), is one of the nation's first assessment for principals based on ISTE's National Educational Technology Standards for Administrators (NETS-A). PTLA is a mechanism to assess principals' relative

strengths and needs in regard to technology leadership and can be a helpful tool to structure principals' dialogue with their school districts regarding their technology-related professional needs and interests.

In 2006, a study conducted in Michigan (Whale, 2006) found that 42 (19.1%) out of 220 school districts in the study included teacher technology skills as an evaluation criterion in formal teacher evaluations. In earlier research about the degree to which principals use and agree with the Technology Standards for School Administrators (Whale, 2003), several principals said that they would like to use teacher technology skills in teacher evaluation, but were prohibited from doing so by union contract.

A majority of the principals interviewed also commented on the need for differentiated professional development that focused on providing principals and teachers with training at their instructional level of expertise. Based on results of conducting a needs assessment, principals could provide a learning model that could challenge the expert technology user and put additional support in place for novice technology users. The teacher evaluations could then be used to measure technology growth as a model of performance improvement.

*Standard VI, Social, Legal, and Ethical Issues*

*Research question 11.* How important do Michigan Elementary Principals rate the NETS-A related to Standard VI, social, legal, and ethical issues, to the job of the principalship?

*Research question 12.* Are Michigan Elementary Principals interested in professional development in the NETS-A related to Standard VI, social, legal, and ethical issues?

The survey and interview questions based on Standard VI took into consideration that educational leaders need to understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues (ISTE, 2002). Principals who effectively lead integration of technology typically perform several tasks relative to this standard:

- Effective principals secure and allocate technology resources to enable teachers to meet the needs of all learners in their classrooms.
- Effective principals adhere to and enforce acceptable use policy and other policies and procedures related to security, copyright, and technology use among staff and students in the districts.
- Effective principals also participate in development of facility plans that support and focus on health and environmentally safe practices related to the use of technology (ISTE, 2002).

The principal and assistant principal ratings for items relating to Standard VI, social, legal and ethical issues, provided evidence that respondents considered those items as important to their positions, but lacked interest in participating in professional development regarding this standard. For example, 20.2% of respondents indicated an interest in professional development to enforce “Acceptable use” policies. These data support research that most principals lack the ability to understand various policy and planning issues related to the successful implementation of technology and therefore do not feel obligated to be a part of its planning. Generally, the responses of the 10 principals indicated that minimal attention was provided for social, ethical, and legal issues of technology integration, with this area designated as a central office responsibility. A majority of the interviewees commented that policies are made at the district level, and their role was to help enforce the policies by discussing their importance with the staff, students, and the school community, along with providing reminders of their importance.

However, in reality, if principals are using and encouraging technology use within their buildings, they should have the knowledge needed to ensure proper use of technology by teachers and students. Principals should demonstrate an understanding of current ethical and legal standards regarding rights and restrictions governing technology, technology systems,

digital media and information technology within the context of today's society. Based on the interview responses, principals appear to have basic knowledge within this area. Parents are becoming increasingly alarmed regarding the issue of privacy. Although, all principals interviewed had media policies for parents to sign, security and privacy concerns are continually questioned with such things as: What information about my student or their associations to the classroom, school, or district must be revealed to others, and under what conditions? What information does the student have a right to access, under what conditions and with what safeguards? Valid concerns have been raised with regard to issues of Internet safety and the need to help young people learn to use information and communication technologies in an ethical and socially-responsible manner (Berson, Berson, & Ralston, 1999). As incredible as something like the Internet has proven to be, it presents special problems for students regarding the reliability of information, copyrighting, and acquisition of potentially inappropriate information especially for elementary-age students.

Federal and/or state laws and district policies regarding technology can often times only be reactive to situations that develop from new and emerging technologies. Often times, social, ethical, and legal issues associated with technology use often result in questions of personal accountability and honesty with regard to appropriate applications of media or technology, rather than issues pertaining to regulations. For this reason, school personnel need to be familiar with ethical matters of technology use. Situations associated with unethical practices are reminiscent of the tale of the "chicken and the egg" – which came first, the laws that guide human behavior, or the behavior that guides the law (Schnackenberg, Vega, & Relation, 2009).

### ***Ancillary Findings***

The ancillary findings provided additional support that principals were generally unaware of standards for technology, although they answered the items as important. Principals,

regardless of the length of time spent in technology related professional development, participation in on-line courses, or the location of the school (urban, rural, suburban) did not differ significantly in their responses to the items on the survey.

### **Implications for Practice**

This section describes implications for practice and research that this study's findings have for principals' professional development of in the area of educational technology. The findings of this study provide valuable information to guide decision making by Michigan politicians, policymakers, the Michigan Department of Education, colleges and universities, as well as state, county, and local school districts. The most important issue for effective technology use in schools is presence of informed and effective principals. However, many principals do not feel comfortable with technology and have significant professional development needs in this area as indicated by this study. It is worth mentioning again that this study is based on the National Educational Technology Standards for Administrators (NETS-A) and improvements considered for more effective and meaningful professional development should be considered in relationship to these research-based standards.

Principal's preparation in technology is a key element in promoting technology success in schools (Hope, Kelley, & Kinard, 1999). However, as results of this study found, minimal attention has been given to preparing school administrators for their role as technology leaders. As a result, many of today's administrators lack technology skills and experiences necessary to be effective technology leaders. Research indicates that few school administrators use technology meaningfully to improve the efficiency and effectiveness of their work (Riedl et al., 1998). Without basic technology competency, most school leaders lack the ability to understand the various policy and planning issues related to the successful implementation of technology (McLeod et al., 2005).

Creighton (2003) stated that, “even the best of schools have barely tapped the potential of technology to radically impact teaching and learning” (p. 2). As results of this study indicated principals identified as technology leaders in the State of Michigan lack the skills needed to implement the latest school reform efforts.

If the potential of educational technology in all schools is to be realized, now is the time to focus on and commit resources to professional development of principals in the area of educational technology. Principals must be engaged in comprehensive, long-term planning to encourage and implement systemic changes for a globalized vision of teaching and learning using new and innovative technology tools as they become available. Principals also must model good instructional practices including modeling the use of appropriate technology use for school reform efforts.

Consideration regarding innovative methods of professional development delivery (e.g., online and distance learning opportunities) need to be made available. Principals need the flexibility and individualized experiences that this method of delivery may afford. Principals also need to have opportunities to engage in collaborative networks to enhance their professional practices.

Aspiring principals participating in current university-based educational leadership preparation programs need coursework dedicated to learning to be effective technology leaders in 21<sup>st</sup> century schools and beyond. These classes should create lifelong technology users, willing to adapt to new advances in educational programming as they arise.

In conclusion, this study can contribute to a better understanding of current professional development needs of practicing principals in the area of educational technology. Though the study was limited to elementary principals in the State of Michigan, results of the study have nationwide implications. Other researchers nationally could perform similar surveys within a

state or region to determine where educational leaders stand in terms of educational leadership and professional development efforts.

### **Recommendations for Future Research**

This study provided insight into Michigan elementary principals' perceptions of the level of importance of technology leadership standards to the role of the principalship as instructional leaders, their interest in professional development in these standards, and a description of the implementation of these standards from 10 principals identified as effective technology leaders. The study also raises questions that can be answered by further research. Recommendations for further research include:

- Further study could examine the efficacy of technology-related professional development available for principals to determine gaps in available professional development.
- The quantitative and qualitative components of this study included surveying and interviewing elementary principals. This study did not consider the perceptions and feedback from secondary principals, associate principals, and assistant principals. Additional research should include these building level administrators who are responsible for helping teachers and staff implement technology in their classrooms.
- The qualitative component of this study included interviews of principals determined as effective technology leaders. This study should compare the responses of principals relative to their self-reported levels of expertise from intermediate or novice technology users.
- Further research could focus on sources of funding for providing professional development in technology, as well as determining how to obtain resources for developing technology-rich schools.

- As this study revealed the need for differentiation of professional development for a range of technology users, further study on current levels of technology integration by teachers in Michigan schools could be useful in promoting systemic change in technology use in schools.
- Further studies could take a closer look at specific emerging technologies and their effect on student achievement.
- Additional research could be conducted using other district leaders such as technology directors, curriculum staff, or superintendents as the focus group.
- A longitudinal study measuring change in the efficiency and expertise of staff in a single school or school district could be used to determine if the principal has the ability to cause dynamic movement in adapting technology over time.

### **Concluding Statement**

In conclusion, the findings in the present study regarding the professional development interests and needs of Michigan elementary principals provide information on their readiness to contribute to the reinvention of education and schools and willingness to adapt systemic change in the 21<sup>st</sup> century and beyond. The 21st century educational leader needs to embrace technology and create new opportunities for its use. The world that students have inherited is a high-tech, fast-changing environment and an effective principal has to merge technology into curriculum development and assessment. For leaders to articulate such visions, they need to understand how technology can be used as instructional and classroom management tools in the teaching and learning dyad across all disciplines. Stegall (1998) suggested that principals' technology leadership is essential in elementary schools. If teachers are to be supported in their efforts to implement technology, then professional development is needed to address the myriad of knowledge and organizational issues faced by teachers as they attempt to incorporate new



learning areas as part of their everyday curriculum offerings in the elementary school context (Darling-Hammond, & Berry, 1998).

This study is intended to transform principals into positive change agents who oversee development of a vision, lead the creation of a plan, participate in professional development, and model successful integration of technology skills into best practices for future elementary principals in the State of Michigan. The role of the principal as documented in the literature is important as a leader of change and technology reform, as well as an instructional leader and school visionary. Michigan principals recognized the importance of the NETS-A to their role as instructional leader of the school. However, the interest in professional development signals a lack of readiness or comfort as a leader of change in technology reform in the State of Michigan. The interest in professional development signals elementary principals' and assistant principals' willingness to improve their practice and accept challenging demands of leading systemic change in technology implementation. Therefore, educational stakeholders can consider the following recommendations in building the leadership capacity in principals needed to implement systemic technology reform:

- State and district leaders need to find ways to provide adequate time and other incentives for administrators to participate in meaningful technology-related professional development.
- State and district leaders need to include building principals and assistant principals in creating strategic plans that include extensive technology-related professional development with continuous revision of the plan to adapt to changing needs.
- State and district leaders should design and develop expectations for administrators that include the NETS-A. Opportunities for professional development and practice should be available in a variety of technology formats and modes of delivery.

- State and district leaders are encouraged to provide opportunities for principals recognized as effective technology leaders to share ideas and successes through professional dialogues, observations, and modeling sessions.
- Recently, Michigan released the 2010 Educational Technology Plan that included 2010-2012 goals and objectives of the Michigan State Board of Education and the Michigan Department of Education (MDE) related to increasing and improving learning options and outcomes for all Michigan PreKindergarten through grade 16 students. Within this plan, districts should carry out the effective application of educational technology and data to inform instruction. This study can help to outline further initiatives for the Michigan State Education Technology Plan and more specifically a focus for the roll –out of Goal 2: Leadership and Goal 3: Professional Learning.

**APPENDIX A****NATIONAL EDUCATIONAL TECHNOLOGY STANDARDS  
FOR ADMINISTRATORS (ISTE, 2002)***National Educational Technology Standards for Administrators*

ISTE National Educational Technology Standards (NETS) and Performance Indicators for Administrators (Developed by the TSSA Collaborative and adopted by ISTE NETS)

**I. Leadership and Vision**

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

Educational leaders:

- A. facilitate the shared development by all stakeholders of a vision for technology use and widely communicate that vision.
- B. maintain an inclusive and cohesive process to develop, implement, and monitor a dynamic, long-range, and systemic technology plan to achieve the vision.
- C. foster and nurture a culture of responsible risk-taking and advocate policies promoting continuous innovation with technology.
- D. use data in making leadership decisions.
- E. advocate for research-based effective practices in use of technology.
- F. advocate, on the state and national levels, for policies, programs, and funding opportunities that support implementation of the district technology plan.

**II. Learning and Teaching**

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

Educational leaders:

- A. identify, use, evaluate, and promote appropriate technologies to enhance and support instruction and standards-based curriculum leading to high levels of student achievement.
- B. facilitate and support collaborative technology-enriched learning environments conducive to innovation for improved learning.
- C. provide for learner-centered environments that use technology to meet the individual and diverse needs of learners.
- D. facilitate the use of technologies to support and enhance instructional methods that develop higher-level thinking, decision-making, and problem-solving skills.
- E. provide for and ensure that faculty and staff take advantage of quality professional learning opportunities for improved learning and teaching with technology.

### **III. Productivity and Professional Practice**

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

Educational leaders:

- A. model the routine, intentional, and effective use of technology.
- B. employ technology for communication and collaboration among colleagues, staff, parents, students, and the larger community.
- C. create and participate in learning communities that stimulate, nurture, and support faculty and staff in using technology for improved productivity.
- D. engage in sustained, job-related professional learning using technology resources.
- E. maintain awareness of emerging technologies and their potential uses in education.
- F. use technology to advance organizational improvement.

### **IV. Support, Management, and Operations**

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

Educational leaders:

- A. develop, implement, and monitor policies and guidelines to ensure compatibility of technologies.
- B. implement and use integrated technology-based management and operations systems.
- C. allocate financial and human resources to ensure complete and sustained implementation of the technology plan.
- D. integrate strategic plans, technology plans, and other improvement plans and policies to align efforts and leverage resources.
- E. implement procedures to drive continuous improvements of technology systems and to support technology replacement cycles.

### **V. Assessment and Evaluation**

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

Educational leaders:

- A. use multiple methods to assess and evaluate appropriate uses of technology resources for learning, communication, and productivity.
- B. use technology to collect and analyze data, interpret results, and communicate findings to improve instructional practice and student learning.
- C. assess staff knowledge, skills, and performance in using technology and use results to facilitate quality professional development and to inform personnel decisions.
- D. use technology to assess, evaluate, and manage administrative and operational systems.

## **VI. Social, Legal, and ethical Issues**

Educational leaders understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues.

Educational leaders:

- A. ensure equity of access to technology resources that enable and empower all learners and educators.
- B. identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology.
- C. promote and enforce privacy, security, and online safety related to the use of technology.
- D. promote and enforce environmentally safe and healthy practices in the use of technology.
- E. participate in the development of policies that clearly enforce copyright law and assign ownership of intellectual property developed with district resources.

(National Educational Technology Standards for Administrators, published by the International Society for Technology in Education, (ISTE), NETS Project, copyright 2002, ISTE, 800.336.5191).

**APPENDIX B****PERFORMANCE PROFILES FOR PRINCIPALS (ISTE, 2002)**

ISTE National Educational Technology Standards (NETS) and Performance Indicators for Administrators (Developed by the TSSA Collaborative and adopted by ISTE NETS).

**NETS for Administrators****Profiles for Technology-Literate Administrators****Principal Profile**

Principals who effectively lead integration of technology typically perform the following tasks. Effective principals:

**I. Leadership and Vision**

1. participate in an inclusive district process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.
2. develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan.
3. promote highly effective practices in technology integration among faculty and other staff.

**II. Learning and Teaching**

4. assist teachers in using technology to access, analyze, and interpret student performance data, and in using results to appropriately design, assess, and modify student instruction.
5. collaboratively design, implement, support, and participate in professional development for all instructional staff that institutionalizes effective integration of technology for improved student learning.

**III. Productivity and Professional Practice**

6. use current technology-based management systems to access and maintain personnel and student records.
7. use a variety of media and formats, including telecommunications and the school website, to communicate, interact, and collaborate with peers, experts, and other education stakeholders.

**IV. Support, Management, and Operations**

8. provide campus-wide staff development for sharing work and resources across commonly used formats and platforms.
9. allocate campus discretionary funds and other resources to advance implementation of the technology plan.
10. advocate for adequate, timely, and high-quality technology support services.

**V. Assessment and Evaluation**

11. promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity.
12. implement evaluation procedures for teachers that assess individual growth toward established technology standards and guide professional development planning.
13. include effectiveness of technology use in the learning and teaching process as one criteria in assessing performance of instructional staff.

**VI. Social, Legal, and Ethical Issues**

14. secure and allocate technology resources to enable teachers to better meet the needs of all learners on campus.
15. adhere to and enforce among staff and students the districts acceptable use policy and other policies and procedures related to security, copyright, and technology use.
16. participate in the development of facility plans that support and focus on health and environmentally safe practices related to the use of technology.

(National Educational Technology Standards for Administrators, published by the International Society for Technology in Education, (ISTE), NETS Project, copyright 2002, ISTE, 800.336.5191).

APPENDIX C

TECHNOLOGY LEADERSHIP STATE GRADES AND RANKS  
(Education Research Center, 2008)

Technology Leadership: State Grades and Ranks

Overall Score	Grade	Rank	Access to Technology		Grade		Use of Technology		Grade		Capacity to Use Technology		Grade	Rank	
West Virginia	95	A	1	South Dakota	100	A	1	Arizona	100	A	1	Georgia	100	A	1
South Dakota	92	A-	2	Wisconsin	100	A	1	Georgia	100	A	1	West Virginia	100	A	1
Georgia	91	A-	3	West Virginia	96	A	3	North Carolina	100	A	1	Kentucky	93	A	3
Virginia	89	B+	4	Wyoming	94	A	4	Utah	100	A	1	Connecticut	86	B	4
Kentucky	88	B+	5	North Dakota	93	A	5	Arkansas	90	A-	5	Florida	86	B	4
North Dakota	86	B	6	Maine	91	A-	6	Florida	90	A-	5	Illinois	86	B	4
Florida	85	B	7	Virginia	90	A-	7	Idaho	90	A-	5	Louisiana	86	B	4
Louisiana	82	B-	8	Kansas	88	B+	8	Kentucky	90	A-	5	New Hampshire	86	B	4
Pennsylvania	82	B-	9	Nebraska	88	B+	8	Louisiana	90	A-	5	North Dakota	86	B	4
North Carolina	82	B-	10	Pennsylvania	86	B	10	Maryland	90	A-	5	South Dakota	86	B	4
Oklahoma	81	B-	11	New Mexico	85	B	11	Michigan	90	A-	5	Texas	86	B	4
Wisconsin	81	B-	12	Montana	84	B	12	Missouri	90	A-	5	Virginia	86	B	4
Arkansas	80	B-	13	Indiana	83	B	13	Oklahoma	90	A-	5	Alaska	80	B-	13
Kansas	80	B-	14	Kentucky	83	B	13	South Dakota	90	A-	5	Arkansas	80	B-	13
Wyoming	80	B-	15	Connecticut	81	B-	15	Virginia	90	A-	5	California	80	B-	13
South Carolina	80	B-	16	Florida	80	B-	16	West Virginia	90	A-	5	Iowa	80	B-	13
Illinois	79	C+	17	South Carolina	80	B-	16	Alabama	80	B-	17	Maryland	80	B-	13
Texas	79	C+	17	Vermont	80	B-	16	Alaska	80	B-	17	New York	80	B-	13
Connecticut	79	C+	19	North Carolina	79	C+	19	Colorado	80	B-	17	Ohio	80	B-	13
Maine	79	C+	20	Idaho	79	C+	20	Hawaii	80	B-	17	Oklahoma	80	B-	13
Arizona	78	C+	21	Iowa	78	C+	21	Illinois	80	B-	17	Pennsylvania	80	B-	13
Indiana	78	C+	21	Minnesota	78	C+	21	Indiana	80	B-	17	South Carolina	80	B-	13
Maryland	78	C+	23	Massachusetts	75	C	23	Kansas	80	B-	17	Vermont	80	B-	13
Alaska	78	C+	24	New Jersey	75	C	23	Maine	80	B-	17	Washington	80	B-	13
Missouri	77	C+	25	Ohio	75	C	23	Massachusetts	80	B-	17	Alabama	73	C	25
Nebraska	76	C	26	Alaska	74	C	26	Minnesota	80	B-	17	Arizona	73	C	25
Vermont	76	C	27	Georgia	74	C	26	Mississippi	80	B-	17	Colorado	73	C	25
Michigan	76	C	28	Oklahoma	74	C	26	New Jersey	80	B-	17	Delaware	73	C	25
Idaho	76	C	29	Illinois	73	C	29	North Dakota	80	B-	17	Indiana	73	C	25
Massachusetts	76	C	30	Michigan	73	C	29	Oregon	80	B-	17	Kansas	73	C	25
New Jersey	76	C	30	Texas	73	C	29	Pennsylvania	80	B-	17	Massachusetts	73	C	25
Iowa	75	C	32	Arkansas	71	C-	32	South Carolina	80	B-	17	Mississippi	73	C	25
New Hampshire	75	C	33	Louisiana	70	C-	33	Tennessee	80	B-	17	Missouri	73	C	25
Ohio	75	C	34	Tennessee	70	C-	33	Texas	80	B-	17	Nebraska	73	C	25
Minnesota	74	C	35	Missouri	69	D+	35	Wyoming	80	B-	17	New Jersey	73	C	25
Tennessee	74	C	36	New Hampshire	69	D+	35	California	69	D+	36	Tennessee	73	C	25
Utah	74	C	37	Washington	67	D+	37	Connecticut	69	D+	36	Wisconsin	73	C	25
New Mexico	73	C	38	New York	66	D	38	Delaware	69	D+	36	Hawaii	66	D	38
Alabama	73	C	39	Alabama	66	D	39	Iowa	69	D+	36	Maine	66	D	38
Colorado	72	C-	40	Colorado	65	D	40	Montana	69	D+	36	Michigan	66	D	38
New York	72	C-	42	Nevada	65	D	41	Nevada	69	D+	36	New Mexico	66	D	38
Montana	71	C-	43	Utah	63	D	43	New Hampshire	69	D+	36	North Carolina	66	D	38
Mississippi	70	C-	44	Arizona	62	D-	44	New Mexico	69	D+	36	Rhode Island	66	D	38
California	69	D+	45	District of Columbia	62	D-	44	New York	69	D+	36	Wyoming	66	D	38
Hawaii	68	D+	46	Delaware	61	D-	46	Ohio	69	D+	36	District of Columbia	59	F	46
Delaware	67	D+	47	California	59	F	47	Rhode Island	69	D+	36	Idaho	59	F	46
Oregon	66	D	48	Hawaii	59	F	47	Vermont	69	D+	36	Montana	59	F	46
Rhode Island	65	D	49	Mississippi	59	F	47	Washington	69	D+	36	Nevada	59	F	46
Nevada	64	D	50	Oregon	59	F	47	Wisconsin	69	D+	36	Oregon	59	F	46
District of Columbia	60	D-	51	Rhode Island	59	F	47	District of Columbia	59	F	51	Utah	59	F	46
U.S.	77	C+		U.S.	75	C		U.S.	80	B-		U.S.	75	C	

Technology Counts 2008: STEM: The Push to Improve Science, Technology, Engineering, and Mathematics  
Editorial Projects in Education Research Center, 2008

[www.edweek.org/go/tc08](http://www.edweek.org/go/tc08)



**APPENDIX D****COVER LETTER FOR SURVEY &  
SURVEY OF TECHNOLOGY EXPERIENCES (BILLHEIMER, 2007)**

**January 22, 2010**

Dear Principal,

My name is Lisa Rivard and I am a doctoral student in Instructional Technology at Wayne State University. I am writing to seek your voluntary participation in a study of Michigan principals being conducted as part of the requirements for completing my doctorate. Your opinions will be very important to the success of the study.

It is my understanding that you have experience in serving as an elementary principal or assistant principal. Your name was selected randomly from a list of Michigan principals and assistant principals. The survey will ask your opinion about the importance of technology and your interest in technology related professional development.

Your participation is voluntary and your answers are completely confidential. Data will be reported in aggregate form only with no identification of individuals. The identifying number on the survey will only be used as a method to send follow-up surveys to non-responders. When you return your completed survey today, your name will be deleted from the participant list. Your name is not connected to your answers in any way. This survey is completely voluntary and you may decline to participate without penalty. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628.

Results from the survey will be used to help make decisions about technology and professional development needs. If you have additional questions, you may contact me at \_\_\_\_\_ or by email at \_\_\_\_\_.

You are asked to answer the questions as honestly and accurately as possible. Please return all responses to me as soon as possible, yet no later than March 1, 2010. Please accept my appreciation in advance for your cooperation and timely participation in this research study.

Sincerely,

Lisa Rivard

**SURVEY OF TECHNOLOGY EXPERIENCES (BILLHEIMER, 2007)**

**Part I. Following is a list of technology related statements. In Column A, please rate the level of importance each statement is to the role of the principalship on a scale of 1 to 7 with:**

**1 = Not Important** (I do not think this is important at all to the job of the principal.)

**4 = Important**

**7 = Very Important** (I think this is essential for a principal as an instructional leader.)

**In Column B, please indicate your interest in professional development on the topic by marking yes or no.**

<b>I believe that a principal should:</b>		<b>Column A Level of Importance</b>							<b>Column B Are you interested in professional development on this topic?</b>	
		<b>1 = Not Important 4 = Important 7 = Very Important</b>								
1	participate in a district wide process for developing a shared vision for technology use.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
2	work with staff to develop technology-rich school improvement plan grounded in research.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
3	support a strong technology committee within the school.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
4	promote effective practices in technology integration to improve instruction.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
5	provide teachers with technology to design, assess, and modify student instruction.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
6	participate in professional development with instructional staff for effective technology integration.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
7	use current technology-based management systems to maintain personnel and student records.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
8	use email to communicate with at least two groups of stakeholders: teachers, parents, community, or peers.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
9	use telecommunications and/or the school website to communicate and collaborate with others.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
10	provide school-wide technology professional development for sharing ideas and resources.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
11	allocate discretionary funds/ resources to advance implementation of the school technology plan.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>

<b>I believe that a principal should:</b>		<b>Column A Level of Importance 1 = Not Important 4 = Important 7 = Very Important</b>							<b>Column B Are you interested in professional development on this topic?</b>	
12	advocate for adequate, timely, and high-quality technology support services.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
13	promote and model technology use analyzing data improving student learning and productivity.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
14	guide teacher professional development toward individual growth in technology.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
15	include effective technology use as one criterion in assessing performance of instructional staff.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
16	secure and allocate technology resources to enable teachers to meet the needs of all learners.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
17	enforce an “Acceptable Use Policy” and other policies related to security, copyright, and technology use.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>
18	participate in planning a focus on healthy and safe practices related to technology use.	1	2	3	4	5	6	7	<b>Yes</b>	<b>No</b>

**Please continue on next page.**

**Part II. Based on your current job, please complete the following.**

1. I am currently a(n):  Assistant Principal     Principal     Neither
2. I routinely access email.  
 Yes     No     No computer
3. I routinely do work related technology activities from home.  
 Yes     No     No computer
4. In the last year I have participated in technology related professional development for:  
 None     Less than 1 hr     Between 1-4 hrs  
 Between 5-10 hrs     11 hours or more
5. I have taken an online course.  
 Yes     No
6. The grade levels in my school are: \_\_\_\_\_
7. I would consider the school community:  Rural     Suburban     Urban
8. Number of years in my current position: \_\_\_\_\_
9. I have worked in education for: \_\_\_\_\_ years.
10. I am:  21-30 yrs old     31-40yrs old     41-50 yrs old  
 51-60 yrs old     61+ years old
11. My highest degree is:  
 Bachelors     Masters     Specialist     Doctoral     Other

**Thank you for participating in this study.**

**If you have lost or misplaced the return envelope, please mail to:**

**Lisa Rivard**

## **APPENDIX E**

### **INTERVIEW PROTOCOL**

#### **Interview Agenda**

- Request permission to tape the interview
- Explain the purpose of the study.
- Guarantee confidentiality
- Remind the participant that participation is entirely voluntary and there is no penalty for nonparticipation.
- At any time the participant may stop the interview.
- Assure the participant that the Wayne State University Graduate Office and the HIC approved the study.

#### **Script**

Once again thank you for participating in this interview. This will take approximately forty-five minutes of your time. I will ask you some questions and you will answer the questions based on your experiences. There may be no benefits for you; however, information from this study may benefit other people now or in the future. The possible benefits to you for taking part in this research study will be information in helping you as an educational leader to develop professional development opportunities that integrate technology based constructs as a part of current school reform efforts. The risk associated with this research is a potential loss of confidentiality.

There is no cost or payment to you. If you have questions while taking part, please stop me and ask. Your answers are completely confidential. Data will be reported in aggregate form only with no identification of individuals.

I will be recording the entire interview, in fact the recorder is currently on and taping. Because I am recording, I may or may not take notes while you are speaking. I will be transcribing the interview within the next week. The information you share today will become part of this study, as well as this interview. However, you will only be identified as a participating principal and never by name. Also any names you give during this interview in relationship to a school, teacher, or student will also not contain identifying information. Now that we have discussed the Ground Rules and Summary of Rights, we are going to get started on the focus of the interview which is the relationship between educational leadership and the use of technologies in schools.

If you have questions about this research study you may call me at \_\_\_\_\_ . If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628.

Your participation in this research is voluntary, and you will not be penalized or lose benefits if you refuse to participate or decide to stop. May I continue?

By now you have had a chance to look over the focus questions for the interview that I sent by email. Are there any questions before I begin with questions?

### Questions Grouped by NET-A standards:

#### Leadership and vision

1. Begin by sharing how technology is currently being used in your school.
2. How do you model effective technology use in your school?

#### Learning and teaching

3. Please share some examples of effective technology use by teachers in your school.
4. What role do you feel technology plays in student achievement?

#### Productivity and professional practice

5. Please describe the technology related professional development plans you have implemented in the last year.
6. What new support do you want to provide for schools and classrooms in regards to Technology?

#### Support, management, and operations

7. Explain how you are able to support technology integration in your school.
8. How do you utilize technology to support your management related tasks in school?

#### Assessment and evaluation

9. How does technology contribute to your school improvement plan?
10. When conducting teacher evaluations, what do you look for and how do you determine effective technology use and integration?

#### Social, legal, and ethical issues.

11. What kinds of policies and practices do you have related to security, copyright, and technology use?
12. How are you able to secure and allocate resources for technology integration in teaching and learning?

Please share anything else you would like to tell me concerning technology in your school or about the direction you would like to take your school with technology.

Thank the principal for their time and response. Assure the participant of how important the responses are to gain a clearer description of technology within Michigan schools, in particular the role of principal in supporting technology initiatives.

## APPENDIX F

### CONSENT FORMS

#### Research Informed Consent

Title of Study:

ENHANCING EDUCATION THROUGH TECHNOLOGY:  
PRINCIPAL LEADERSHIP FOR TECHNOLOGY INTEGRATION IN SCHOOLS

Principal Investigator (PI): Lisa Rivard  
Wayne State University – Instructional Technology

**Purpose** You are being asked to be in a research study of elementary school administrators and how each adapts to the introduction and integration of new technology in their schools. You are being asked to participate because you are a Michigan K-6 public school principal. Your name and address has been provided by Michigan's electronic data base. Only principals and assistant principals at the elementary level that hold at least a K-8 certification in administration are being asked to participate. Elementary will be defined as a school servicing kindergarten through sixth grades or any combination of.

This study is being conducted at Wayne State University. **Please read this form and ask any questions you may have before agreeing to be in the study.**

In this research study, the researcher will examine how technology is increasingly becoming an important factor in the school curriculum and in the education system, as it is seen to enhance and improve student learning. The researcher will also look at how this poses a challenge to school administration and as a result the need for comprehensive technology training programs.

**Study Procedures** If you agree to take part in this research study, you will be asked to participate in the Survey of Technology Experiences (Billheimer, 2007). You may also be selected to participate in a face to face interview.

1. Participants in this study will be asked to complete a survey on technology experiences. The survey will be replicated to fit the needs of this study.
2. The survey will take no longer than one half hour of the participant's time. The researcher has sent the survey via mail along with the consent to all participants.
3. The Survey of Technology Experiences consists of 18 close-ended items developed from the national technology standards in the U.S. and uses a seven- point Likert scale. The *Survey of Technology Experiences* consists of 18 close-ended items developed from the six standards of leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. Each participant is asked to rate the level of importance for each statement in relation to their own position of principal. The level of importance of the items from the six standards of the NETS-A has responses on a scale from 1 to 7 with the following criteria: 1 = "Not important", 4 = "Important" and 7 = "Very Important". Three questions were developed for each of the six standards for a total of 18 items. Additional items on the survey relate to interest in professional development. Participants have the option of answering "yes" or "no" when asked about

interest in professional development for each of the 18 items taken from each of the six standards of the NETS-A. Demographic data will also be collected.

4. Surveys will be coded to protect participants' identity.
5. In addition to the survey, approximately ten survey participants will be invited to volunteer for an in-depth interview through their participation in the survey and based on established criteria. The interview will consist of open ended questions about technology use and principal leadership. The interview should last no more than 45 minutes in length. The researcher will have the option of videotaping the interview and collecting field notes. All names and places mentioned that are related to the participant will be coded to protect participants' identity.

**Benefits** There may be no benefits for you; however, information from this study may benefit other people now or in the future. The possible benefits to you for taking part in this research study will be information in helping you as an educational leader to develop professional development opportunities that integrate technology based constructs as a part of current school reform efforts.

**Risks** The risk associated with this research is a potential loss of confidentiality.

**Alternatives** The only other alternative is to not participate.

**Study Costs** Participation in this study will be of no cost to you.

**Compensation** You will not be paid for taking part in this study. You will receive a gift card for participating if chosen for the face to face interview.

**Research Related Injuries** No reimbursement or compensation is offered by Wayne State University, the State of Michigan, or Michigan Elementary and Middle Schools Principal Association (MEMSPA). If you think that you have any questions related to the research, contact the PI right away at .

**Confidentiality** All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code number. Information that identifies you personally will not be released without your written permission. However, the study sponsor, the Human Investigation Committee (HIC) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.] may review your records.

When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity.

If audiotape recordings of you will be used for research or educational purposes, your identity will be protected or disguised. If tapes are used the tapes will be destroyed within one year of collection. The subject does have the right to review the tape but not edit. Names and places relevant to the participant will be coded and pseudonyms will be used after the coding is complete.

**Voluntary Participation/Withdrawal** Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you decide to take part in the study you can later change your mind and withdraw from the study. You are free to only answer questions that you want to answer. You are free to withdraw from participation in this study at any time. Your



decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

The PI may stop your participation in this study without your consent. The PI will make the decision and let you know if it is not possible for you to continue. The decision that is made is to protect your health and safety, or because you did not follow the instructions to take part in the study.

**Questions** If you have any questions about this study now or in the future, you may contact Lisa Rivard or one of her research team members at the following phone number . If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

**Consent to Participate in a Research Study**

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

\_\_\_\_\_  
Signature of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of participant

\_\_\_\_\_  
Time

\_\_\_\_\_  
Signature of person obtaining consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of person obtaining consent

\_\_\_\_\_  
Time

**APPENDIX G****CONTENT VALIDITY QUESTIONS (DILLMAN, 1978)****Content Validity Questions Developed by Original Researcher**

1. Will the words be uniformly understood?
2. Do the questions contain abbreviations or unconventional phrases?
3. Are the questions too vague?
4. Is the question too precise?
5. Is the question biased?
6. Is the question objectionable?
7. Is the question too demanding?
8. Is it a double question?
9. Does the question have a double negative?
10. Are the answer choices mutually exclusive?
11. Has the researcher assumed too much knowledge?
12. Has too much been assumed about respondent behavior?
13. Is the question technically accurate?

(Dillman, 1978, pp. 99-114).

**APPENDIX H****SAMPLE OF TRANSCRIPTED INTERVIEWS****INTERVIEW #1**

**I will be asking you questions based by the NETS-A standards and the first two are on Leadership and Vision. If you could just begin by sharing how technology is currently being used throughout your school.**

It is being used by just about every one of my staff members. In the office, staff keeps our student data base and our student records, our attendances all through our technology. Everything that we do in the front office really has a technology piece added to it. Our automated phone system allows us to contact all of our parents to deliver messages. We also have our PTO using technology. If we go to our PTO website, they built a website this year that actually has a list server built in just to keep everybody informed on what we are doing and what and what is happening in the school. Myself, in my office, use technology extensively for data to keep track of data, to desegregate data. Data Director is a key component of how we are going to implement our instruction, based on student achievement. We have to know where the kids are before we can move them forward. Also, the teachers, on a daily basis are using technology for records, for grades, using technology, e-mail to share ideas, to bounce off ideas, to find research, to find websites. We are very lucky here at our school. We have quite a bit of technology to use. We have a series of laptop carts that students will then sign out, or teachers have students use in work stations. We do a lot of PowerPoint presentations. We use technology as a tool to serve their curriculum. It is not the curriculum itself; it is just a tool we use to assist the curriculum, for the research, for the presentation, as key component for our technology. The technology is something that we drive on and we continue to use it and implement it.

**How do you model effective technology use in your building?**

In the building here, I am actually one of the technology trainers in the building. I do a lot of work with the teachers on an individual level. If they do not know how to work on one of the pieces or when we meet during our grade level data team meetings, we will talk about how we can use technology to enhance the curriculum, to help the students get a better understanding of their curriculum, to help the students with their presentation skills. As far as our data instruction, I also train all of my staff members in a program called Data Director. Data Director is a program that we are able to see all of our students results, tracking back a few years if we would like, but more importantly tracking back to exactly what is happening right now so then we can adapt our instruction based on student results right now, where they are. This is a program that I know I have had spent an excessive amount of time helping my staff understand the program, along with other programs also.

**Now, you have given some examples of how effective technology is used by your teachers in your school? How else do you see your teachers using technology as you walk around the building?**

41 I see a lot with the instructors. We do a lot of center based, hands on instruction, especially when  
42 it comes to our science instruction. The students will be recording their data from science  
43 experiments and then using the technology to write up their science plan, or to write up their  
44 science experiment. We also use for our writing; we use a lot of technology for our final pieces.  
45 We can have a final published piece, not just typing in there, but also when we do, more  
46 importantly the revision process. If a student writes out a whole page by hand, the chances of  
47 them going back and revising it are slim, but if they can go back, just like myself, I write on the  
48 computer and then go back read it and change words, change adverbs, move things around, so  
49 that we have a good solid writing piece. We will use our 6+1 writing traits, so we will go back,  
50 for instance we are looking on voice and then when we go back to revise, we see our paper right  
51 there on the computer and then we are able to go back and add some key elements to voice or  
52 key elements to organization. We use this technology pretty much on a daily basis. The students  
53 use quite a bit of technology for researching, we do a lot of research papers and finding out the  
54 facts that we need to implement into our lessons and then using those facts. We also do quite a  
55 bit of video conferencing here. We have used video conference this year. We have been video  
56 conferenced with, I don't quite remember the name of it, but it was a science center in Antarctica  
57 and we had a unit on weather and they were talking, we actually talked real time with a scientist  
58 that was doing some weather studies down in Antarctica. We have also talked to the San Diego  
59 Zoo. We have also been with COSI in Columbus, Ohio, Ann Arbor, with some people at  
60 University of Michigan. We have been doing quite a bit of video conferencing on a big level, but  
61 also video conferencing, sharing writings and sharing ideas with schools that are maybe 2-3  
62 miles down the road, but we have a different perspective when we talk with some other students.

63 **You mentioned students and their role in technology, what role do you feel technology**  
64 **plays in student achievement?**

65 The technology really is just a tool. Technology is not the student achievement. We want our  
66 students to be proficient in our standards. We want all of our students to have a mastery of their  
67 grade level context expectations before they leave that grade level. Now what we use technology  
68 for is a tool just like in days past, we would use the ruler or the pencil, whatever tools were  
69 available to you. What happens with technology, our tools are so much more advanced that we  
70 are able to do a lot more.

71 **Could you take a minute to describe the technology related professional development plans**  
72 **or PD that you have implemented in this last school year?**

73 Well the big one for this year has been our Data Director data warehouse. Data Director really  
74 came on to the scene with us at our school at the end of the spring time last year. This year, my  
75 goal was then to have that up and running so that all of my teachers were able to access Data  
76 Director and be able to use the data and desegregate the data so we are not spending, hours and  
77 hours and hours of work, as far as checking the papers, finding out what questions they missed,  
78 finding out what GLCE's they missed and where we can adapt our instruction with that. With  
79 Data Director, we can do that in five minutes. We scan them right through, we have our grade  
80 level test, our chapter test units, whatever you call it. We have it right there, the results and we

81 know where we need to move on. We take the pretest, we move on to some project monitoring  
82 then we have a post-test piece and we can still see even from the post test if there is something  
83 that we missed. The teachers then can spend the time using this developing instruction on key  
84 components of GLCE's that were not necessarily covered to mastery as we thought. The  
85 technology allows us to do this. Professional development wise, we spent probably, I would say  
86 4-5 hours this year at staff meetings, after school time, working in the computer lab just to get a  
87 better sense of how the program works and started to make some exams and start to run some  
88 exams and collate them with our GLCE's. This is going to be the plan until the next things  
89 comes around that helps us out. That is one really great thing about technology is that we always  
90 have something better that is going to save us even more time and I think that the teachers find  
91 that very important, that technology piece saves us time. It saves us time to work on what we  
92 really need to work on.

93 **Now you mentioned the next thing. What new support would you want to provide for your**  
94 **school and your classrooms in regards to technology?**

95 Well time would be the biggest thing. I mean that is something that I know we do not necessarily  
96 have. I mean there are a million different programs and lesson plans and online support and I  
97 know that our textbooks, for instance, I know we went to, as principals, we went to an  
98 outstanding math in-service that actually showed us the text books and lessons that they had,  
99 supplement lessons, advanced lessons, beginning lessons, all right on the computer. We can take  
100 now five computers, put them in one little math group while the teacher is working with another  
101 group. We actually have direct instruction coming from the computer. I would like to spend  
102 more time emphasizing technology support so our students aren't getting only direct instruction  
103 from the teacher, they are getting it double dipped, triple dipped, so that we can keep moving  
104 forward in helping those students out. Especially students at the lower levels where if you know  
105 if we can get more support, we are not going to have problems down the road.

106 **The next two questions talk a little bit more about support and management and the**  
107 **operations of technology. If you could just explain how you are able to support technology**  
108 **integration, those new things that come to your building within your school.**

109 Well, I am very fortunate here at my building. We have quite a few teachers who are very tech  
110 savvy and in fact, by all means, I am not the leader on the tech savvy place here. I try to teach as  
111 much as I possibly can, but I have teachers that I will show them a program and boom, they are  
112 ready to run. They are a very young staff, so they are all into the gadgets and everything else that  
113 goes with it, that I am learning from them just as much as they are learning from me, even  
114 though it is a brand new program and I show it to them, they will come back and show me  
115 something that is far more advanced than I ever did. So it is kind of like a give and take here.

116 **How do you utilize technology to support your management related tasks within your**  
117 **school?**

118 The management tool SASI was a big one for us right now, as far as the management of  
119 attendance and the management of guiding student records and when we transfer students within  
120 the district. The management of our data teams has been tremendously supported by technology.

121 In the past, I know I have spent hours and hours and hours writing graphs from the MEAP scores  
122 and writing graphs from the end of the year assessments or mid-year assessments. Now, with the  
123 advent of Data Director, I can just pop them right out, so the management has saved up a lot of  
124 time for me. Management, as far as with the e-mail, we are able to communicate with everybody  
125 in the whole district. If I have a question or something, I can really just quickly shoot an email to  
126 my board office, they can get right back to me, I can shoot an email right to other principals if I  
127 have any questions. One of the nicest inventions that we have had in the last couple of years is  
128 our phone service. I am able to talk, leave a message on 500 peoples telephones all at once to tell  
129 them events that are coming up, tell them about certain things that are coming up. Another one of  
130 the big inventions that we had is Maintenance Connection. Maintenance Connection is a program  
131 that we can use to write our maintenance needs. For instance, if I have a tile popping up, I go  
132 right onto the computer, I state specifically what it is and then it goes through and the carpenters  
133 know exactly what the problem is so they are not coming out to my school looking to see what  
134 the problem is, going back, getting the tools that they need, coming back. What we end up doing  
135 is really saving a lot of time, save a lot of money by knowing what the problem is, they get the  
136 stuff that they need, it is already here when they are ready to go.

137 **The next two questions deal with assessment and evaluation. How does technology**  
138 **contribute to your school improvement plan?**

139 Well, technology really is one of the key components of our school improvement plan. Our  
140 school improvement plan definitely is set to guide our students to mastery of all of our GLCE's.  
141 That is the end result of all of our school improvement, where we want to go from. Well, if we  
142 do not know where the students are at any particular time, how are we going to ever get them  
143 there? Also it helps with the students that need that extra support, or with students that actually  
144 need the advanced studies. What we can end up doing is once again through Data Director, it is  
145 my new favorite program, what we can end up doing is take the beginning of a chapter test, we  
146 would run it through, we would find out exactly what students scored, where they are at, what  
147 they already know, what they don't know, where we can focus our instruction on and if we have  
148 students that already are scoring 95 to 100%, on this chapter test, well why would we sit there  
149 and teach them for a month the same thing that they already know. We now know that we can  
150 then advance their learning through this. Also, with our spreadsheets and some other data  
151 assessments, we can organize all of our students for instance by Rigby levels for reading. We  
152 organize them, we can plot their growth and where they are going. We can find out which  
153 students did not show much growth and then we get our special education teacher and our  
154 reading consultants involved. We have all kinds of different avenues to support those students, so  
155 once again they are getting not only reading instruction from the teacher, they are getting double  
156 dipped, triple dipped so we can get to the level that they need to be at.

157 **When conducting teacher evaluations, what do you look for and how do you determine**  
158 **effective technology use and integration within that classroom?**

159 That is a tricky one, because I do have a couple of teachers here who are very, very effective, but  
160 I can tell you that I have one teacher here who has been in the district for 40 years. Now here

161 technology is not up to par as far as what I would consider, she does not really utilize the  
162 technology and in fact, she still has a record player in her classroom. But, the thing is, the  
163 students learn. So, she does it a little differently and she utilizes the same mastery of the  
164 GLCE's, but what I have tried to explain to her in the past is that she is just working harder, the  
165 technology tools are here to save the time of the teacher, to help the teacher, to not only enhance  
166 the ability to conduct instruction, she is doing the exact same thing, but for instance, instead of  
167 printing off a graph of where her students are right from our data warehouse, she is doing it all  
168 by hand and it is getting the graph and getting the information, but it is taking quite a bit of time.  
169 But, when I look at the majority of my teachers, we have teachers utilizing technology every day  
170 in the classroom. When I do my walk thrus, the laptops are always constantly in use. Our two  
171 computer labs are always constantly in use. We see all the time our video conferencing being  
172 used. We see all of the time students using it, not just to play a game on technology, but actually  
173 to utilize and enhance their instruction. So, I think that any time a teacher works with the  
174 technology, it is not only saving her or him a lot of time, but it is giving those students an extra  
175 push and an extra ability to focus on the instruction and focus on what they are learning and to  
176 learn about the technology too. The technology is going to a piece that we are going to have  
177 forever, it is not going anywhere, it is only going to get more and more advanced and I think the  
178 more we have our students immersed in it, the better off they are going to be, so we try to convey  
179 that message to all of my staff, to get the students immersed in technology, but not just  
180 technology, but using it as a curriculum tool.

181 **The next two questions talk about ethical, social and legal issues. What kinds of policies**  
182 **and practices do you have related to security, copyright in technology?**

183 We have an outstanding program. We are a wireless school. We have all of our laptops, all of our  
184 computers are instantly hooked up to the net from anywhere in the building. The great thing  
185 about the program that we have is a blocker, the program does block unethical sites, or sites that  
186 we just don't want our students to be at. That also helps us with our security. As far as copyright  
187 issues, anything that is on the web, we may use it, but we do not publish it. For instance, if a  
188 student finds a great beautiful picture of a mountain that was taken from somewhere and adds it  
189 to their presentation, they use it for their presentation, but we do not publish it anywhere, so I  
190 don't think that we are really in violation of any copyright laws, but we are just using it for our  
191 purposes here and get the students to take it home. As far as our security, our security with our  
192 technology, we also have in our front office, we have security cameras, we have one right on the  
193 front door, right on our back door. That is a piece of technology that we can see who is coming  
194 into our school, who we are buzzing back to the back of our school and then the office staff have  
195 a button that they can hit to unlock the door, so we do have a tight security where we can keep  
196 the building on lockdown all of the time. Our teachers also have their badges which work as a  
197 key card. All of our buildings, except for our front door are locked all of the time. The only way  
198 we can get in is if you have a key or if you have the security key card, so the teachers have  
199 access to come in and out all of the time, but it keeps us safe knowing who is in our building at  
200 all times.



201 **How are you able to secure and allocate resources for technology integration in teaching**  
202 **and learning?**

203 With the budget cuts coming up, that is always a tough one, how we can secure additional  
204 resources. Sure I would love to have a computer, I would love to have computers for every one  
205 of my students in the school, but unfortunately, we do not have those kinds of resources. What  
206 we do is our district has provided us with a couple of bond issues. The bond issues have really  
207 focused on implementing instruction, implementing technology for instruction.

208 **What about professional development?**

209 Professional development really happens on pretty much my own time with my own staff. We do  
210 not really have much money as far as to send people out or to train people on different things, but  
211 we are creative to allocate resources and to allocate professional development, even for the  
212 students. One example is our gifted and talented program. They were making I-movies, learning  
213 how to make commercials. They actually took a field trip over to the Apple store and so we used  
214 the resources of the Apple store to utilize some higher level technology components by people  
215 that really know what they are doing and they really showed the kids and then the students  
216 actually came back and then they started teaching their counterparts, the other students and their  
217 teachers and now everybody is up and running and pretty fluent on that piece. So I think that you  
218 really have to be creative, especially with all of the cuts that are coming down, you really have to  
219 be creative in technology. You can't just jump for the next best thing because there is always  
220 going to be something better.

221 **As the school principal and as a leader, just share anything else that you would like to tell**  
222 **me concerning technology in your school or about other direction you would like to take**  
223 **your school with technology.**

224 I think that as we go further in depth in technology and the prices eventually do come down, I  
225 definitely would like to immerse more of my students in the use of technology. I feel that here in  
226 my building, we definitely are. You can walk by any building, any room, any day, you are going  
227 to see even the first grade rooms, you are going to see kids working on laptops, you are going to  
228 see kids in the computer pods, you are going to see kids that are working with I-movie or the  
229 Elmo machines, or the teachers utilizing those. I think that more technology and that goes back  
230 to the funding issue, more technology is definitely going to be more beneficial because it is  
231 going to support the curriculum even more in depth. It gives students a hands-on access to what  
232 we are doing and what we need to do. I think that as far as management from my part in the  
233 building, and my office staff here, the more it grows; the better off it is going to be, just with the  
234 example of the phone system that we used to have. It used to be that if I wanted to contact  
235 everybody, I was writing them a letter and it would go out, and then 2-3 days later they would  
236 get it and then send it back and some would send it back some would never get it, and we would  
237 start putting it in the mail and that is a whole lot of money on stamps. Now I can easily contact  
238 everybody instantly. And same with our PTO website. We have a list server built, everybody that  
239 wants to sign up for it can sign up for it and we get all of the information directly to you, as soon  
240 as it is possible.

241

242 **INTERVIEW #2**

243

244 **I will be asking you questions based by the NETS-A standards and the first two are on**  
245 **Leadership and Vision. If you could just begin by sharing how technology is currently**  
246 **being used throughout your school.**

247 Currently technology is mainly used in the form of email, which is used to communicate with  
248 staff. Staff use it to communicate with parents, I am using to communicate with parents through  
249 email. The second major form of technology that we are seeing is the data warehouse tool, which  
250 is a data warehouse of student information that is pulled together to use for data teams. Some  
251 other forms of technology that have been observed are some online resources that students access  
252 through the Media Center. There are a couple of teachers have been observed doing interactive  
253 Jeopardy with their students using technology. We are hoping eventually to get clickers to add  
254 that in, but right now it is more of a communication tool, a data tool to share data back and forth  
255 and is slowly building into more and more student integration.

256 **How do you personally model effective technology use in your building?**

257 A couple of different ways. I actually taught technology lessons with some of the grades being a  
258 former technology teacher. There are some lessons that I enjoyed teaching at different levels, so  
259 when I hear a teacher is covering that area of the curriculum, I offer to do a lesson with them for  
260 them using the technology that is available in the building. Smart Board is one of my favorite  
261 models because there is so much you can do with it. Also modeling use of technology at staff  
262 meetings; like making use of the data projector, the document cameras, showing that there are  
263 other ways besides an overhead, to display materials. I use technology myself to communicate  
264 with staff, with parents, a lot of the information sent to staff and sent to parents is put in a PDF  
265 file and attached now versus using a paper document. So, pushing more towards integrating  
266 technology in all areas and encouraging teachers to have kids instead of doing the paper pencil  
267 tasks, they can use an online form or they can build a project based through PowerPoint, through  
268 Hyper Studio, through something like that. Students are more engaged, so I try to model that  
269 with the staff as well.

270 **The next two questions talk about learning and teaching. Please share some examples of**  
271 **effective technology used by your teachers in your school?**

272 As far as learning and teaching goes teachers who have the document cameras available to them  
273 in their classrooms along with a data projector to go with it will use that a lot more effectively in  
274 their teaching and learning. They will model different writing samples, they can put student  
275 writing samples right up on the document camera for the class to edit together. They can share  
276 their own writing samples, they can put a page from the book as they are doing informational  
277 texts or any type of text genre and the students can follow along with them. I have noticed  
278 teachers using the document camera in science to zoom in on different things and project it up,  
279 especially in a rock unit so that the students could really see it close up and in person. Some  
280 other examples of effective technology, is when fourth grade teachers did an interactive  
281 PowerPoint. A few years ago used to be the Michigan Curriculum or Social Studies Curriculum,

282 so instead of having the students create the paper and pencil report, they did it all in interactive  
283 PowerPoint and we have done the same thing with Hyper Studio.

284 **What role do you feel technology plays in student achievement?**

285 Technology is not going to go away. Technology is going to continue to advance and get more  
286 advanced and students are going to be way ahead of where we are as far as technology, so as far  
287 as student achievement, that is their language. Students get technology. That is how they speak  
288 and we need to learn their language. We speak it with an accent. They are more native to it and  
289 we need to continue to use technology to engage students. Students respond better to the online  
290 forms, especially the current and upcoming generations. A lot of their life has been television,  
291 video games, interactive computers and if we go to paper pencil tasks, it is not going to engage  
292 their learning. If we try to stretch them using technology, whether it is to create projects or to do  
293 something online, they are much more interested in that than taking a paper to pencil, so we need  
294 to continue as educators to learn and grow along with the students so that we can use technology  
295 to help improve their achievement and help engage them in their learning.

296 **The next two questions talk about productivity and professional practice. Describe any of  
297 the technology related professional development plans or PD that you have implemented  
298 with your staff in this last school year, in your building.**

299 One of the things that was used, which has kind of pushed us is using the data warehouse, which  
300 is pulling data on different students. Some other things that we have done is looking at the use of  
301 the document cameras, use of the Smart Board and how you can use it. The Smart Board can  
302 actually be used as an electronic flip chart, which is absolutely fabulous. You can store all of  
303 your notes from KWL on the Smart Board and then just pull it up through your projector again  
304 and not have to keep the paper hanging all around the room. So it makes it real easy to do some  
305 group work and that so we have had some opportunities for staff to be trained using the data  
306 warehouse, using some online resources. Some of the courses have been on website design; put  
307 together your own classroom webpage, something simple that is not too involved so that teachers  
308 can maintain it. So, different ways to try and help teachers understand the technology, you have  
309 such a wide range. Some teachers are able to use technology and feel comfortable with it, others  
310 are still trying to remember their logins for their email, so you have to take it at different steps.  
311 You have to differentiate your technology professional development, just like you would  
312 differentiate for learning within the classroom for students.

313 **What new support would you want to provide for your school and your classrooms in  
314 regards to technology?**

315 Personally, if I were in the classroom right now as a former tech teacher, I would want a Smart  
316 Board mounted in the front of the classroom with a data projector hanging mounted from the  
317 ceiling that is connected to my main teacher computer, as well as the audio sound system and  
318 having the document camera available so that I can play through whether it is using the United  
319 Streaming, which is an online video storage for different clips that I can project through using  
320 the Smart Board and also lets through in a clicker system as well so that I can work with kids.  
321 This would be the ultimate type of technology to provide for integrating technology on a daily

322 basis with students. That along with having the availability of portable laptop carts, or having the  
323 computer lab that students can be taken to use online resources. That would be a way to try and  
324 get technology integrated on a daily system with kids. We already have some of that going on  
325 with things like Read Naturally, where students are doing Read Naturally during reading time.  
326 Being able to get the technology so it is a daily use for kids and not something that is just a  
327 special occasion.

328 **The next two questions talk about support and management and the operations of**  
329 **technology. If you could just explain how you are personally able to support technology**  
330 **integration within your school.**

331 One of the things I try and do is that we do have some funding where we can use furniture and  
332 equipment replacement, repair and so I try to dedicate a little bit of that to technology purchases.  
333 We are looking at adding more document cameras, adding more data projectors, document  
334 camera carts for teachers, the possibility of putting in a promethium board and looking at what  
335 teachers are asking for and support as far as the students need. Our support staff work with staff  
336 so that we can get programs that we are using, such as the Read Naturally program into our labs,  
337 into our laptops so that students have access on multiple levels to the same types of things. If  
338 teachers have an idea or have seen an idea, we check things out together, see whether or not this  
339 is something that is going to work with our students, if it is research based, as far as the program  
340 or a software piece and if it works with our technology, working with the district level, with their  
341 technology department to see what we need in order to make things work for our students. The  
342 support person is like a technology service person, but she is here part-time and she helps with  
343 repair of machines, uploading, downloading software onto the machines, fixing printers, making  
344 things work within building.

345 **How do you utilize technology to support your management related tasks within your**  
346 **school?**

347 Personally, I could not survive without my own computer, keeping track of whether it is logs on  
348 student issues, staff issues, communicating with parents, I do a weekly newsletter to staff that  
349 goes out every Monday morning with updates, calendar events, communicating with staff back  
350 and forth on the issues throughout the day. I also use an electronic system with parents where if  
351 there is something coming up or just little reminders for parents so that they can, it kind of keeps  
352 them in connection with it. Using my email system and calendar system, I use technology to help  
353 keep track of pretty much everything, keeping all of my data in one place, organizing web sites  
354 that I use frequently, so I need my computer, in fact I wish it were a little more portable.

355 **The next two questions deal with assessment and evaluation. How does technology**  
356 **contribute to your school improvement plan?**

357 We actually use our data and store our data that we are using for school improvement through  
358 technology. We have a shared file within our school that all of our core data team members can  
359 access and use and we put our information in there. We keep things like the Golden Package  
360 which comes from the State of Michigan with reports and we kind of store everything in one  
361 location so that we can access different student data all at once. That helps us at least pulling the

362 information together. When we sit down to gather information on students, we take a look at  
363 what can we pull from online. We use technology to take a look at and research different things  
364 that we want to use for RTI (Response to Intervention), different programs. We use technology  
365 for several different things, not just the gathering of data, the storing of data, but also to use it as  
366 research to figure out best practices, to figure out ways to help students best achieve.

367 **When conducting teacher evaluations, do you look for technology use in your classrooms**  
368 **and how do you determine effective technology use and integration by your teachers?**

369 I do look for technology use, see where teachers are, much like when you are assessing the kids  
370 to see where their levels are in reading, you can assess with the staff and see what their levels are  
371 as technology comfort and where they are using it. Basic use is usually in email, teachers are  
372 pretty good about using their email systems. More medium to advanced is having teachers using  
373 software based programs like the Number Worlds, the Read Naturally, some of the things that  
374 we have available, utilizing online sources like the Brain Pop, the United Streaming within  
375 classes, instead of just the standard VHS or DVD, that they are using with classes, whether or not  
376 a teacher is able to operate the technology systems. There are some that are very eager to use  
377 United Streaming, but are not quite sure how to get it to project onto a television or up into a data  
378 projector so that they can share with students. Effective technology use and integration would be.  
379 There are different levels. At the lower level would be the basic email for communication, kind  
380 of a midlevel would be using different programs to support student getting knowledge to  
381 students, presenting knowledge in different ways and then a higher level would be using the  
382 technology to have students show progress and show what they know.

383 **The last two questions deal with social, legal and ethical issues. What kinds of policies and**  
384 **practices do you have related to security, copyright in technology use?**

385 We follow pretty much what the district has in place, as far as technology, policies and practices  
386 and guidelines, which basically comes down to the copyright laws, as far as copying things and  
387 distributing copies. The document camera can often help you get around that a little bit because  
388 you are not actually copying, but you are displaying items for students to reference. We follow  
389 the basic proper use of technology. We do not want to see emails being used and abused for  
390 personal reasons or for sending things out that are not related to education, monitoring what  
391 students are doing as far as projects and not just leaving them unattended in a computer lab or  
392 unattended with technology out in the hallway, that we can monitor what kind of websites they  
393 are accessing. The district does a very good job of screening software that helps keep a lot of  
394 inappropriate type things out of kids view, but a lot of it comes back to teacher monitoring. All  
395 students have signed a technology use policy that outlines what the parameters are and what the  
396 rules and expectations are. All teachers have signed a technology use policy and that is reviewed  
397 and enforced yearly.

398 **How are you able to secure and allocate resources for technology integration in teaching**  
399 **and learning?**

400 We have a couple of different things, the district does give us a little bit of money in a fund and  
401 we can take that and determine how we want to use it best, as far as technology. We actually did

402 some office fundraising on our own, sold some cookie dough and was able to come up with  
403 enough funding to help purchase a research based software and hands-on based math system to  
404 use for Response to Intervention, called Number Worlds, but we did that through a separate fund  
405 raising versus taking it out of our general fund which we were using for more of our whole  
406 student population, where as Number Worlds just hit's a smaller population of students that need  
407 help. Our PTO/PTA organization has also donated funds for technology, helping to buy things  
408 like a document camera or a data projector when they can, setting up a cart system that we can  
409 use, so it is kind of a combination of all different sources. Things that we can use from the  
410 district that is given to us as funds, which is obviously taxpayer dollars, things that we can raise  
411 on our own through special projects, things that are donated to us. We have a center based  
412 program here that receives outside funding from Knights of Columbus, so they have money that  
413 they use from those donations in order to purchase assistive technology pieces so that is another  
414 way that we can get technology in multiple sources without having to always rely strictly with  
415 taxpayer allocated funds.

416 **Is there anything else that you could share regarding technology in your school or about**  
417 **the direction you would like to take your school with technology?**

418 Ultimately, I would like to see more of the higher level technology integration where technology  
419 is not just being used to deliver information, deliver instruction, but technology is actually in the  
420 hands of students, being used by the students to show what they know. To be able to produce  
421 some kind of project or product that illustrates mastery of their GLCES, their content area. That  
422 is really taking that technology and using it as a tool for learning versus taking the technology  
423 and just using it as a way to distribute learning. So, that would be the ultimate goal, is to get it to  
424 that point where teachers feel comfortable enough with using the technology themselves that  
425 students are able to take different projects and just have teacher support. The hard part with that  
426 being the professional development piece, the time for professional development, the  
427 differentiation of professional development for teachers and getting people to feel comfortable at  
428 different levels is a challenge.

**APPENDIX I**

**CORRESPONDENCE**

**LETTER TO SURVEY DEVELOPER SEEKING PERMISSION TO USE SURVEY &  
PERMISSION TO USE SURVEY**

Dixie Billheimer  
2637 Washington Blvd.  
Huntington, WV 25705

Dear Dr. Billheimer,

I am writing to ask permission to use the survey entitled *Survey of Technology Experiences*. This tool would be used to research how elementary school administrators in Michigan adapt to the introduction and integration of new technology in their schools. This survey will help to complete research that will be used in my dissertation for Wayne State University in the field of Instructional Technology. I would appreciate your permission in completing my doctoral requirements.

Please know that I can be reached at the following contacts:

Mail:

Phone:

Email:

I look forward to your response in this matter. Thank you for your time and consideration.

Sincerely,

Lisa Rivard  
Wayne State University Doctoral Student  
Utica Community Schools, Elementary Principal

**PERMISSION TO USE SURVEY**

Dear Ms. Rivard,

I received your request to use my *Survey of Technology Experiences* in your research. I am granting you permission to use this survey with the elementary school administrators in Michigan to complete your research for your dissertation. Best wishes for success in completing your work.

Regards,

Dr. Dixie Billheimer  
Chief Executive Officer  
West Virginia Center for Professional Development  
208 Hale Street  
Charleston, West Virginia 25301  
1-800-982-7348 or 304-558-0539  
FAX: 304-558-0989  
dbillheimer@wvcpd.org



## APPENDIX J

## HUMAN INVESTIGATION COMMITTEE APPROVAL

WAYNE STATE  
UNIVERSITY

HUMAN INVESTIGATION COMMITTEE  
101 East Alexandrine Building  
Detroit, Michigan 48201  
Phone: (313) 577-1628  
FAX: (313) 993-7122  
<http://hic.wayne.edu>



## NOTICE OF EXPEDITED APPROVAL

**To:** Lisa Rivard  
College of Education

**From:** Ellen Barton, Ph.D. *E. Barton*  
Chairperson, Behavioral Institutional Review Board (B3)

**Date:** January 15, 2010

**RE:** HIC #: 129109B3E  
Protocol Title: Enhancing Education through Technology: Principal Leadership for Technology Integration in Schools

Sponsor:  
Protocol #: 0912007876

**Expiration Date:** January 14, 2011

**Risk Level / Category:** Research not involving greater than minimal risk

The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Expedited Review* (Category 7\*) by the Chairperson/designee for the Wayne State University Behavioral Institutional Review Board (B3) for the period of 01/15/2010 through 01/14/2011. This approval does not replace any departmental or other approvals that may be required.

- Recruitment Letter
- Consent Form

- \* Federal regulations require that all research be reviewed at least annually. You may receive a "Continuation Renewal/Reminder" approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval *before* the expiration date. Data collected during a period of lapsed approval is unapproved research and can never be reported or published as research data.
- \* All changes or amendments to the above-referenced protocol require review and approval by the HIC **BEFORE** implementation.
- \* Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the HIC Policy (<http://www.hic.wayne.edu/hicpol.html>).

**NOTE:**

1. Upon notification of an impending regulatory site visit, hold notification, and/or external audit the HIC office must be contacted immediately.
2. Forms should be downloaded from the HIC website at [www.hic.wayne.edu](http://www.hic.wayne.edu).

\*Based on the Expedited Review List, revised November 1998

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**ABSTRACT****ENHANCING EDUCATION THROUGH TECHNOLOGY:  
PRINCIPAL LEADERSHIP FOR TECHNOLOGY INTEGRATION IN SCHOOLS**

by

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Principals need to acquire understanding of, and proficiency in, technology skills and integration to be effective instructional leaders. As issues concerning the lack of systemic change in school reform and technology integration persist, little research has been published concerning the extent to which technology leadership behaviors identified in the National Educational Technology Standards for Administrators (NETS-A; International Society for Technology in Education, 2002) are being implemented in schools. The purpose of this study is to analyze the extent to which Michigan elementary principals employ behaviors that support their role as effective technology leaders.

Michigan K-6 school principals (n = 280) completed the *Survey of Technology Experiences* (Billheimer, 2007) developed from the six NETS-A standards (leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues). Through this quantitative method, the study determined how principals rated the level of importance of the NETS-A and their interest in professional development. Through a qualitative method, this study

describes the principal's current practice and implementation of the NETS-A. Ten principals from K-6 schools participated in in-depths interviews of their training and practice for technology leadership.

Results concluded that the most important issue in effective technology use in schools is presence of informed and effective principals. Many principals, regardless of the length of time spent in technology-related professional development, participation in on-line courses, or location of the school (urban, rural, suburban), did not feel comfortable with technology and had significant professional development needs as indicated by this study. There also was a need for principals to engage in collaborative networks to enhance their professional practice. Furthermore, consideration to innovative methods of professional development delivery, such as online and distance learning opportunities, need be available. Results of this study can be used to prepare Michigan principals for the emergence of a global society's demand of technology competent principals and to align current perspectives of administrator preparation in regards to technology skills and technology leadership to the NETS-A standards.

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