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A Study of Minnesota Elementary Principals' Perceptions on 1:1 Technology Implementation

Susan J. Powell

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**A Study of Minnesota Elementary Principals' Perceptions
on 1:1 Technology Implementation**

by

Susan J Porter Powell

A Dissertation

Submitted to the Graduate Faculty of

St. Cloud State University

in Partial Fulfillment of the Requirements

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Dr. Roger Worner, Chairperson
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Abstract

According to the Center for Universal Education at the Brookings Institute the rapid advancement in technology today requires students to attain a broader set of competencies to be successful than in the past (Winthrop, McGivney, Williams, & Shankar, 2016). To achieve these higher standards, education must take “new approaches that can reach children who have not yet been reached” to attain higher student learning outcomes (Winthrop et al., 2016).

School leadership matters when a school or school district is considering a technology initiative (Anderson & Dexter, 2005) and principals must be increasingly involved in the project to model and support implementation (Anthony & Patavanich, 2014; Stuart, Mills, & Remus, 2009).

“A growing body of evidence has suggested that we are in the midst of a global learning crisis. Pedagogical practices and curricula used in schools are ill equipped to allow children to learn the skills they will need for the future. If education systems in their current form fail to improve learning outcomes, it is because the design of the way education is delivered itself is flawed. In a failed system, incremental improvements are insufficient to bring about the transformational shifts to curriculum and pedagogy needed to get better results.” (Winthrop et al., 2016)

The 2017 National Assessment of Educational Progress (NAEP) depicts Minnesota’s achievement levels relatively unchanged from the 2015 NAEP results, however, Minnesota continues to have one of the largest achievement gaps in the nation (NAEP, 2017). Minnesota school districts are infusing technology into classrooms to address learning disparities, and in 2016 the State of Minnesota reported that 55% of Minnesota schools had operationalized some level of a 1:1 technology initiative.

The purpose of the study was to examine the perceptions of a sampling of Minnesota elementary principals on the extent, value and quality of their involvement in the implementation of their school districts’ 1:1 technology initiatives. Further, the study intended to ascertain the sample group principals’ perceived preparedness to provide leadership and training to their schools’ teaching staffs, (including staff employed one or more years following implementation,) regarding their school districts’ 1:1 technology initiatives.

Acknowledgement

This dissertation journey was extremely long and arduous, fraught with more obstacles than I could have ever imagined. There is deep emotion because I finished and deeper emotion due to all who have passed during these years. It is truly a miracle and the result of many blessings and prayers that I have made it this far.

It goes without saying this study and the completion of my doctoral studies would not have occurred without the love and support of my advisor, Chair and friend, Dr. Roger Worner. I truly do not have the words to articulate my gratitude for Roger's never-ending encouragement and belief that I could finish. I am eternally grateful for your guidance and friendship.

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Table of Contents

	Page
List of Tables	7
Chapter	
1. Introduction	9
Purpose of the Study	15
Statement of the Problem	15
Research Questions	17
Delimitations	18
Definition of Terms	19
Organization of the Study	20
2. Review of Related Literature	21
Introduction	21
History of Technology in the Classroom	21
The Principal as Technology Leader	26
Principal as Leader of Change	30
Professional Development	35
Chapter Summary	37
3. Methodology	39
Introduction	39
Purpose	40
Research Questions	40

	5
Chapter	Page
Participants	41
Human Subject Approval-Institutional Review Board	41
Instruments for Data Collection and Analysis	42
Research Design	43
Procedure and Timeline	44
Summary	45
4. Research Findings	46
Introduction	46
Research Questions	46
Survey Results: Participant Demographics	47
Findings: Presence of 1:1 Technology Initiative	48
Findings: Years of Implementation of 1:1 Technology Initiative	48
Survey Results for Research Question 1: Extent of Involvement in Planning and Implementation	50
Survey Results for Research Question 2: Perceived Quality of Involvement in Planning and Implementation	55
Survey Results for Research Question 3: Value of Staff Development	60
Survey Results for Research Question 4: Preparedness to Provide Leadership and Training	62
Survey Results for Research Question 5: Preparedness to Train Newly Hired Teachers	65

Chapter	Page
Interview Results	68
Conclusion	71
5. Conclusions and Recommendations	72
Study Overview	72
Research Findings: Question One	73
Research Findings: Question Two	75
Research Findings: Question Three	77
Research Findings: Question Four	78
Research Findings: Question Five	80
Discussion	82
Limitations	85
Recommendations for Further Research	86
Recommendations for Practice	87
Summary	88
References	89
Appendices	
A. IRB Approval	103
B. Online Survey	105
C. Informed Consent Form	106
D. Letter from MESPA	107

List of Tables

Table	Page
1. Principal Responses to the Presence of a 1:1 Technology Initiative	48
2. Principal Responses to the Number of Years of 1;1 Initiative	49
3. Number of Responses by Question	50
4. Principals Involvement in Planning 1:1 Technology Initiatives	51
5. Principals' Perceptions of Involvement in Planning 1:1 Technology Initiatives by Years of Implementation	53
6. Principal Involvement in Implementing 1:1 Technology	54
7. Principals' Perceptions of Involvement in Implementing 1:1 Technology	55
8. Principals' Quality of Involvement in Planning 1:1 Technology	56
9. Principals' Perceptions of the Quality of Involvement in Planning 1:1 Technology	57
10. Principals/ Perceptions of the Quality of their Involvement During Implementation	58
11. Principals' Perceptions of the Quality of Involvement in Implementation of 1:1 Technology	59
12. Perceived Value of District Provided Staff Development	61
13. Principals' Perceptions of the Value of District Provided Staff Development for 1:1 Technology Initiatives	62
14. Principals' Perceptions on Preparedness to Provide Leadership on 1:1 Technology Initiatives	63

Table		Page
15.	Principals' Perceptions on Preparedness to Provide Building-Wide Leadership for 1:1 Technology Initiatives	65
16.	Principals' Perceptions on their Preparedness to Provide Newly Hired Teachers Training in 1:1 Technology	66
17.	Principals' Perceptions on Preparedness to Provide Training to Newly Hired Teachers	67
18.	Interviewee Comments Addressing Preparedness to Provide Building Leadership	68
19.	Interviewee Comments Addressing Preparedness to Provide Training	70

Chapter 1: Introduction

According to the Center for Universal Education at the Brookings Institute the rapid advancement in technology today requires students to attain a broader set of competencies to be successful than in the past (Winthrop, McGivney, Williams, & Shankar, 2016). To achieve these higher standards, education must take “new approaches that can reach children who have not yet been reached” to attain higher student learning outcomes (Winthrop et al., 2016).

The 2017 National Assessment of Educational Progress (NAEP) depicts Minnesota’s achievement levels relatively unchanged from the 2015 NAEP results, however, Minnesota continues to have one of the largest achievement gaps in the nation (NAEP, 2017). Minnesota school districts are infusing technology into classrooms to address learning disparities, and in 2016 the State of Minnesota reported that 55% of Minnesota schools had operationalized some level of a 1:1 technology initiative.

Technology usage and expenditures in schools have risen dramatically in recent years. According to Gosmire and Grady (2007) educational technology costs rose by nearly 300% from 1987-2007. Principals are responsible and held accountable for these expenditures, yet few principals are experts in technology (Gosmire & Grady, 2007). The Technology Standards for School Administrators Collaborative recognized in 2001 that the effective 21st Century administrator must be a hands-on user of technology for students and teachers to fully utilize the technology that is infiltrating our schools (TSSA Collaborative, 2001).

In 2001, Public Law 107-110, otherwise known as the No Child Left Behind Act, was enacted by the Congress of the United States to improve academic outcomes for all students, as well as improve student outcomes using technology (Section 2402,b,1). As increased pressures

and penalties associated with the No Child Left Behind Act were occurring in American schools, there was a concurrent expansion of computer technology in volume, complexity and form in schools across the country including the expanded use of computer laboratories and the appearance of interactive white boards in individual classrooms. The No Child Left Behind Act also sought to broaden penalties for those schools receiving federal funding which failed to achieve annual student performance targets, commonly known as adequate yearly progress (AYP) (The Elementary and Secondary Education Act, 2010). Improving the academic performance of all children required that particular attention was to be focused on students who were not achieving at an acceptable level.

Title 1 is a federal statute focused on the achievement of financially disadvantaged children. According to the No Child Left Behind Act, Title 1 encompassed 12 purposes, three of which were to ensure all students had access to highly qualified teachers and curriculum, the achievement gap between different subgroups of children delineated by race and socio economic status was to be reduced and the needs of children with limited English language skills, disabilities, or migratory status were to be met (NCLB. Section 1001). An additional purpose of Title 1 was to amplify the quality of instruction through the mandated use of high-quality research-based instructional strategies and extensive professional development. It was through abiding by the purposes of Title 1 that all children, including students who were under achieving, would receive a fair and equitable education, and at a minimum, reach proficiency on rigorous state academic standards as measured by state assessments (NCLB. Section 1001).

A significant feature of the No Child Left Behind Act of 2001 was the penalties that were to be levied on schools that received Title 1 funding but failed to meet annual achievement

targets. Under the Act, school districts were held accountable for achieving or failing to achieve rigorous targets as referenced in the timeline established by the law stating,

Each State shall establish a timeline for adequate yearly progress. The timeline shall ensure that not later than 12 years after the end of the 2001-2002 school year, all students in each group described in subparagraph (C)(v) will meet or exceed the State's proficient level of academic achievement on the State assessments under paragraph (3). (Title 1—Improving the academic achievement of the disadvantaged, 2005)

AYP was defined by the National Council on Measurement in Education (NCME), as “the amount of annual achievement growth to be expected by students in a particular school, district, or state in the United States federal accountability system, No Child Left Behind (NCLB)” (National Council on Measurement in Education, n.d.).

Failure to achieve AYP resulted in sanctions with increasing impact on underperforming schools and districts. Two years of inadequate academic performance by these schools or districts resulted in the designation, In Needs of Improvement, and after 3 consecutive years of inadequate academic performance, those schools or districts were required to provide free tutoring and supplemental education services to families requesting additional instruction for their students. Following a fourth year of inadequate academic performance, the underperforming schools or districts, were cited for Corrective Action, and a fifth year of inadequate academic performance required the restructuring of those schools or districts. Clearly, the consequences for schools or districts and the pressures applied to principals in those schools receiving federal dollars during the years of No Child Left Behind were significant (Dillon & Rotherham, 2007).

Simultaneous with the enactment of Public Law 107-110 in 2001, it was reported that 99% of public schools had access to the internet, including 87% of all instructional spaces

(NCES, 2002). According to the 2000 United States Census, 51% of households had a computer and 41.5% had Internet access at home. While 41.5% of homes had Internet access, however, only 21% of the children in the United States used the Internet at home for school-related activities (Newburger 2001).

By 2015, active Internet users in the United States as a percentage of the population rose to 75%, and as of January 2016, the NBN Digital Parenting Report stated that approximately 75% of students were using the Internet for homework. Paralleling the increase of internet use at home, the 2014 report by Education Superhighway, “Connecting America’s Students: Opportunities for Action,” asserted that a new generation of educational technology and digital learning opportunities were impacting American classrooms, and the increasing adoption of 1:1 learning models became more common in the 21st century classroom. Technology statistics revealed a substantial expansion of computer and Internet usage by schools, households and students in the 15 years between the 2000 and 2015 (EducationalSuperHighway, 2012).

The influx of technology into schools has been rapid. The Apple Macintosh computer was developed in 1984 at which time the ratio of computers to students was a paltry 1:92 (Sutori, n.d.). Subsequently, the laptop computer was founded in 1988, and a new type of storage, the CD-ROM, followed shortly after in 1990. By 1994 the National Center for Educational Statistics reported 35% of American schools had Internet access, and the delivery of curriculum and instruction by CD-ROM was gaining popularity. SMART boards were introduced into schools in 1999, adding another instructional tool to classrooms. By 2000, 99% of all schools in the United States reported having Internet access, equating to a 64% increase in 6 years. Keeping pace with

the rapidly changing technologies proved to be a challenge for school leaders according to McLester (2012).

In the 2 years from 1997 to 1999, the ratio of computers to students decreased from 1:21 to 1:10 to (less than 10 students per machine) (Computers in the classroom, 2017). Ten years later in 2009, the National Center for Educational Statistics reported the ratio of computers to students had declined to 1 computer for every 5.3 students (1:5.3). A year later, there was one wireless device for every 3.4 students (1:3.4) in United States' schools.

Etherington, (2013) revealed that there were 4.5 million iPads in American schools, and nine out of every ten students under the age of 18 had access to a mobile device. The iPad, first released by Apple on April 3, 2010, is a tablet computer, which uses the iOS operating system (Jobs, 2010). The iPad is characterized by a touchscreen and virtual keyboard and can play music, take photographs, video and perform a multitude of other functions depending on the applications employed. According to Apple in 2013 (Mossberg et al., n.d.), 4.5 million iPads were sold to American schools, while Jacob Kastrenakes (2015) cited that over 250 million iPads had been sold worldwide by January 2015.

A mobile device is basically a handheld computer that has the capacity to perform a plethora of applications formerly reserved for only large, bulky desktop computers (Mobile device, n.d.). A student's mobile device may be a smartphone, tablet, or laptop computer.

By 2016, according to the 1:1 Device Programs Best Practices in K-12 Education Report to the Minnesota State Legislature (n.d.), approximately 55% of Minnesota schools reported some level of a 1:1 program. The term one-to-one (1:1) refers to school-based programs that provide all students with a mobile device such as a laptop or tablet computer: one computing

device for every student (1:1 Device Programs, n.d.). By 2017, the Minnesota Department of Education projected another thirty 1:1 device initiatives would begin, while numerous established programs would be expanding (Minnesota Legislative Reference Library, 2016). These technology growth statistics support Larry Cuban's (2003) findings that as computers have become more accessible and inexpensive, demand has increased.

As the infusion of technology intensified in American schools, the role of building leadership or the principal as an instructional leader has become more complex, resembling a second-order change according to the author of *Revolutionizing Education through Technology*, (Greaves, 2012). "Second-order changes introduce new goals and interventions that transform the familiar way of doing things into novel solutions to persistent problems" (Cuban, 1988). As schools and districts changed from one textbook per student to one mobile device per student, so has the leadership of principals evolved from the "familiar" to "novel", and in this rapidly changing technology environment, this was to be only the beginning of new responsibilities and pressures experienced building principals (Fullan & Langworthy, 2014).

Since 2001, the confluence of the No Child Left Behind Act and the rapid increase of technology in schools has increased the pressure on the principal to advance student achievement as well as to modify their role as the school's instructional leader. Clearly, the No Child Left Behind Act had exerted intense pressure on school leaders to achieve increased academic outcomes for all children while internet connectivity for United States schools was at 99% (NCME, 2002). Consequently, mobile devices have inundated our schools and classrooms (Etherington, 2013). As a result, district and building leaders were in a position in which they were challenged to master their own personal technology skills, much less provide technology-

based instructional leadership and technology skill development to their staff members. With the expansion of classroom technology use in American schools, the principal's responsibilities increased for sustaining a yearly minimal level of skill and knowledge for effective 1:1 technology initiatives by their teaching staff members and, were responsible for ensuring the training of new staff members who arrived as a result of predictable annual teacher attrition (Greaves et al., 2010). In addition to the principals' challenges of maintaining a highly skilled staff, there was the personal challenge of remaining current, knowledgeable and skilled in the rapidly changing world of educational applications (Gosmire & Grady, 2007).

Purpose of the Study

The purpose of the study was to examine the perceptions of a sampling of Minnesota elementary principals on the extent, value and quality of their involvement in the implementation of their school districts' 1:1 technology initiatives. Further, the study intended to ascertain the sample group principals' perceived preparedness to provide leadership and training to their schools' teaching staffs, (including staff employed one or more years following implementation,) regarding their school districts' 1:1 technology initiatives.

Statement of the Problem

Many school districts in the State of Minnesota experience intense pressure to address academic challenges through personalized learning, including student mastery of the Minnesota State Standards and closing the student achievement gap. According to Fiedler and Väljataga (2011), personalized learning requires the individualization of academic tasks increasingly delivered through a computerized program that modifies instruction and student practice based on individual responses and represents a significant shift in traditional pedagogical approaches to

the learning process. The infusion of technology into all aspects of a student's education has encouraged school districts to adopt district-wide technology initiatives including 1:1 initiatives. To address education's need for increased student performance, Sir Ken Robinson said, "Education doesn't need to be reformed—it needs to be transformed" (2014, p. 63).

Many American schools and districts attempt instructional transformation through the implementation of 1:1 initiatives. For the infusion of technology devices to provide the impetus for change from traditional teaching and learning methodologies to a platform of more personalized learning, building level leaders and teachers must have acceptance of the initiatives. According to Michael Fullan, "Effective school leaders are key to large-scale, sustainable education reform" (Fullan, 2007, p. 16) and must be able to garner buy-in from their teaching staffs for success.

Successful second order change initiatives require acceptance of and knowledge from those leading the initiatives as well as those implementing the change in the classroom (McRel, 2016). According to Kotter (2012), a minimum of 50% staff engagement is necessary to successfully drive a large-scale change. Staff buy-in occurs through involvement and belief that there is a distinct and necessary need for the implementation of a new initiative. Once the school principals are committed to the initiatives and can communicate a clear understanding of the "why, how and what" of that initiative to building staff, barriers to change are reduced (McRel 2016). The principal is then able to create a demand for the initiative, motivate staff to actively engage in professional development and support implementation in the classroom (McRel 2016).

The implementation of more personalized learning opportunities through the addition of 1:1 technologies requires acceptance of the initiative particularly by principals who will be

expected to provide continuous leadership to current staff and those who will be employed following the original district-wide staff development. It was reported that 58% of Minnesota districts with a 1:1 initiative indicate not enough time is devoted to professional development (1:1 Device Programs Best Practices in K-12 Education, 2016). This statistic has clear implications for building leaders including their training and skills in sustaining 1:1 initiatives.

The inception of 1:1 initiatives in Minnesota schools occurred nearly 20 years ago when the first laptop programs were instituted in two Minneapolis high schools in 1998. By February 2016, approximately 55% of all Minnesota schools had implemented some type of 1:1 program, most of which were less than 4 years old, and at that time the Minnesota Department of Education projected 30 additional programs would be initiated in the next year (1:1 Device Programs Best Practices in K-12 Education, 2016) and continue to increase at a rapid rate. Because 1:1 initiatives are relatively new nationally and in Minnesota, there is a need to examine the involvement of principals with the infusion of this educational tool in American schools.

Toward this end, the mixed method study will investigate Minnesota elementary principals' involvement in systemic change processes with regard to 1:1 initiatives that will impact their schools, staffs and students. No studies of this type have been identified to date.

Research Questions

1. How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school districts' 1:1 technology initiatives?

2. How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
3. How did a select sample of Minnesota elementary school principals rate the quality and value of the staff development provided by their school district related to the 1:1 technology initiatives?
4. How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staff on their school districts' 1:1 technology initiatives in their school building?
5. How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on their school districts' 1:1 technology initiatives?

Delimitations

According to Roberts (2010), delimitations identify the planned limits of a study including factors the researcher was able to control and the manner in which the researcher focused the study. The following delimitations were implemented:

- a) Elementary schools located exclusively in the State of Minnesota were included in the study.
- b) Only Minnesota elementary school principals were surveyed.
- c) Only Minnesota elementary schools serving students through grade eight were included in the study.

- d) Only current Minnesota Elementary School Principal Association (MESPA) members were offered the opportunity to participate in the study.

Definition of Terms

Achievement gap: For the purposes of the study, this term refers to a persistent disparity of academic performance between different groups of students as defined by gender, race, first language and socioeconomic status (United States Department of Education, n.d.).

Adequate yearly progress (AYP): Refers to a measurement defined by the United States Department of Education under the No Child Left Behind Act, which indicates a public school is performing at a proficient level (NCLB 2001).

Bring Your Own Device (BYOD): Refers to a student's personal mobile device, as opposed to a school provided device (Cambridge Dictionary, n.d.).

First order change: Refers to small adjustments made to a current structure (Marzano, Waters, & McNulty, 2005).

Mobile device: For the purposes of this study, this term refers to a portable technology device such as a laptop, smartphone or tablet (Cambridge Dictionary, n.d.).

Personalized learning: Refers to academic practice and instruction provided in a mode which maximizes learning, individual interest and engagement for each child and may include technology (Excel in Ed, n.d.).

Second order change: Refers to change that requires new learning and a new methodology for completing something (Marzano et al., 2005).

1:1, 1:2 or BYOD: For the purposes of the study refers to the ratio of computers to students and may be used interchangeably.

Organization of the Study

The study is organized into five chapters. Chapter 1 includes an introduction to the study, the problem statement, the purpose, research questions, delimitations, and organization of the study. Chapter 2 provides a review of related literature that examines current 1:1 initiatives and how school leadership impacts successful change. Chapter 3 includes the Institutional Review Board submission, description of the population surveyed, timelines, research methodology, instrumentation, data collection procedures, and data analysis procedures. Chapter 4 reports the data gathered during the study and summarizes the findings. Chapter 5 incorporates the conclusions and recommendations for future research.

Chapter 2: Review of Related Literature

Introduction

The purpose of the study was to examine the perceptions of a sampling of Minnesota elementary principals on the extent, value and quality of their involvement in the implementation of their school districts' 1:1 technology initiatives. Further, the study intended to ascertain the sample group principals' perceived preparedness to provide leadership and training to their schools' teaching staffs (including staff employed one or more years following implementation), regarding their school districts' 1:1 technology initiatives.

The literature review is comprised of four sections. The first section outlines the history of the evolution of educational technology and the second section examines the principal's role as a technology leader. The third and fourth sections examine the principal as the leader of change and professional development needs.

History of Technology in the Classroom

Over the past several decades, educational leaders have adopted and adapted a variety of learning technologies in their school districts. With each passing year, those learning technologies expanded at an exponential rate and placed increasing demands on students, teachers, principals and school districts to maintain the innovations (Office of Educational Technology, 2010). Embracing innovative learning technologies in the classroom is not a new phenomenon as educational leaders have consistently strived to acquire or implement new tools to increase academic achievement.

The introduction of non-primitive learning technologies into the classroom began in 1910, when according to Paul Saettler, film was approved for classroom instruction in the

Rochester, New York schools. Shortly thereafter, in 1913, Thomas Edison predicted that film would revolutionize classroom instruction and stated, “Scholars will soon be instructed through the eye. It is possible to touch every branch of human knowledge with the motion picture” (Cuban, 1986). The use of film in the classroom soon became the standard of innovative teaching practices (Cuban, 1986). Four decades later, however, teachers infrequently used films for instructional purposes (Cuban, 1986). According to Cuban (1986,) film usage in the classroom failed to achieve Thomas Edison’s predictions due to:

- ~Teachers’ lack of skills in using equipment and film
- ~Cost of films, equipment, and upkeep
- ~Inaccessibility of equipment when it is needed
- ~Finding and fitting the right film to the class

Radio followed film as the subsequent learning technology phenomenon, incorporating instruction over the airwaves in 1923 (www.masterofartsinteaching.net). At its peak, the nation’s longest operating system of its kind, the Wisconsin School of the Air, enrolled 330,000 K-8 students in Wisconsin (Davidson, n.d.). The School of the Air based its instructional lessons on Dewey’s progressive educational beliefs, which focused on active involvement by students (Bianci, 2002; Cuban, 1986). The School of the Air struggled with sustainability in the classroom primarily due to money, equipment and reception (Cuban 1986, p. 25), although it remained active for 45 years until it discontinued operation in the mid-1970s.

Among the most prominent learning technologies of the 1930s was the overhead projector. Originally designed for the United States military for training purposes during World War II, overhead projectors were adopted by schools like the United States Military Academy,

and subsequently, K-12 school districts (Smithsonian, 2013). Some researchers believed the entire field of non-primitive learning technology resulted from adopting World War II training methods into public school classrooms (Olsen & Bass, 1982). With the adoption of overhead projectors in the classroom, instructors were able to write classroom notes on a thin film that was projected on a wall-mounted screen while facing the students. Forty years after its original introduction in schools, the overhead projector became a mainstay in American classrooms in the 1970s (Akanegbu, 2013). With the current rapid advance of technology today, it is difficult to comprehend an innovation would require forty years to achieve common usage.

In the 1950s the dominant new learning technology was instructional television delivered in learning laboratories with headphones (Cuban, 1986). During that decade federal funds were allocated for instructional technology through the 1958 National Defense Education Act (NDEA) (Cuban, 1986). Instructional television was supported by public and private funds and was initially proposed as a solution to both teacher shortages and demands for improved curricula (Cuban, 1986). Teachers in three states reported using instructional television two to 4% of the instructional day, which equated to less time than walking to and from restrooms (Cuban, 1986). With such minimal usage, instructional television failed to achieve a sustained or measurable impact on classroom instruction or student achievement (Cuban, 1986).

The Elementary and Secondary Education Act of 1965 provided the impetus for the use of learning technology employing computers for instructional purposes in American schools. Initially, school districts employed large, mainframe computers to provide limited assistance to teachers in the classroom while serving more broadly in performing administrative and counseling functions (The history of computers in education, n.d.). By the late 1970s and early

1980s, computer laboratories equipped with one computer for each child were common in American schools. Computer assisted instruction—prevalent in the 1980s—focused on the use of computers for drill and practice activities (Cotton, 1991). Research conducted by Kulik and Kulik (1991) found that access to the school’s computer laboratory once or twice a week was inadequate to achieve significant gains in student learning, while teachers reported restricted access to laboratory computers reduced the students use of technology (Adelman et al., 2002; Cuban 2003). Computer laboratories of the late 1970s and early 1980s are considered the forerunners of today’s school and school district 1:1 learning technology initiatives (Sykora, 2014).

In 2001 the No Child Left Behind Act (NCLB) was enacted by the United States Congress to improve academic outcomes for all students in American schools (The Elementary and Secondary Education Act, 2010). The No Child Left Behind Act stated, “the improvement of student achievement through the use of technology in elementary and secondary schools” was a primary goal of the United States Department of Education (Section 2402, b, 1). This goal, coupled with potential increased penalties from the NCLB legislation for schools and school districts that failed to achieve adequate student progress, advanced the timetable for the implantation of 1:1 learning technologies in school districts.

In addition to the statutory requirements specified in the No Child Left Behind Act, the National Education Technology Plan specified that “schools should provide students with appropriate learning devices” (USDOE, 2017, p. 76). Toward that end, 1:1 learning technology initiatives rapidly became a foundation for student learning and work and, according to Costa (2012), without 1:1 access students could not be properly prepared for life. Weston and Bain

(2010) asserted that we may be in the midst of a complete paradigm shift in education where technology is the essential learning tool and 1:1 initiatives are approaching the tipping point of being the rule rather than the exception (Pitler, Flynn, & Gaddy, 2004; Weston & Bain, 2010). According to Richardson, McLeod, Flora, and Sauers (2013) large scale 1:1 initiatives were a global phenomenon in which South America led the world with more than 5.5 million devices involved in 1:1 initiatives. In that light, it would seem that research on effective school leadership is essential to ensure the success of 1:1 initiatives.

Many school districts in the United States have achieved the goal of student access to a variety of 1:1 mobile devices including iPads and laptops. The National School Boards Association reported 37% of the school districts in the United States have 1:1 technology initiatives (Nagel, 2010). Bebell and O'Dwyer (2010) noted the 1:1 student to computer ratio would soon be considered the norm in education. As recently as 2013, 4.5 million iPads were sold to American schools (Etherington, 2013). According to the 1:1 Device Programs Best Practices in K-12 Education Report to the Minnesota State Legislature in 2016, approximately 55% of Minnesota schools reported some type of a 1:1 program, with approximately 30 additional 1:1 programs planned for initiation in 2017.

The expansion of 1:1 initiatives in Minnesota, the United States, and throughout the world warrant an in-depth study of the role of school principals involvement in the planning, implementation and sustainability of 1:1 initiatives since the “ principal’s leadership has a major impact on education technology usage” (Greaves, Wilson, Gielniak, & Peterson, 2010).

The Principal as Technology Leader

Niels Bohr, famed Danish physicist (1885-1962), stated prior to his death in 1962 that “Technology has advanced more in the last thirty years than in the previous two thousand. The exponential increase in advancement will only continue.” Considering Bohr was quoted more than 55 years ago, the technological advancements experienced in the last decade illustrate the accuracy of his assessment and, indeed, the impact of technology on all facets of the society, the workplace, and schools. Recently, a Minnesota superintendent noted in his dissertation, “There is an increasing concentration of mobile learning devices in classrooms, a rapidly emerging educational technology pedagogy expectation for teachers, and changing expectations of district leadership in our educational institutions” (Tryggestad, 2015, pp. 142-143). In essence, Tryggestad affirmed that school leaders must be prepared to provide technology leadership in their buildings, including 1:1 technology initiatives.

The demands on principals to maintain a current understanding of technological advancements, including leading 1:1 technology initiatives continues to increase. The International Society for Technology Education (ISTE), an organization which developed numerous resources for leading, teaching and learning with technology, established technology standards for teachers, students (ISTE-S), and administrators (ISTE-A). The original ISTE standards were published in 2007 and were revised in 2012 to include specific competencies for school administrators regarding technology leadership (www.iste.org).

The ISTE Standards for Administrators (ISTE-A) included performance indicators in five distinct areas: visionary leadership, digital age learning culture, excellence in professional practice, systemic improvement and digital citizenship (ISTE, 2012). In keeping with the

changing pace of technology in American schools, the ISTE Standards for Administrators are under review and possible update with an anticipated June 2018 release date. The ISTE standards are frequently used as the benchmark for leadership indicators when conducting instructional technology research (Metcalf & LaFrance, 2013; Richardson, Bathon, Flora, & Lewis, 2012; Richardson, Flora, & Bathon, 2013; Richardson & McLeod, 2011; Sincar, 2013; Unal, Uzun, & Karatas, 2015).

ISTE standard–visionary leadership. Vision is often identified as the most foundational skill of a technology leader. A principal with vision is necessary to articulate a clear and concrete plan that motivates and supports teachers in reaching the school’s technology goals (Grady, 2011; Hughes & Burke, 2014).

Senge (1990, p.192) stated, “...shared vision is vital for the learning organization because it provides the focus and energy for learning. While adaptive learning is possible without vision, generative learning occurs only when people are striving to accomplish something that matters deeply to them.”

A shared vision developed between principal and teachers is the driving force behind any successful technology initiative (ISTE, 2012). Particularly in a 1:1 technology initiative, the principal is critical in employing a process to develop a shared vision that involves all stakeholders, including the school community. A shared and clearly articulated vision provides support for changing long held mindsets. Ultimately, successful technology initiatives involve principals who are adept at creating and maintaining a critical sense of urgency and changing mindsets (Richardson, McLeod et al., 2013). According to Kotter (2012) newly acquired mindsets must be continually nurtured to prevent a return to traditional thoughts and practices.

Interestingly, principals indicated their preparation as a visionary leader was the lowest of the five ISTE-A domains (Metcalf 2013; Grey-Bowen, 2010; Miller, 2008). Hence, leadership skills, including the ability to clearly articulate a vision for technology, are essential for principals who will be leading 1:1 technology initiatives (ISTE 2012).

ISTE standard–digital age learning culture. According to the ISTE–A standards, a successful technology leader must be capable of promoting and sustaining a digital age learning culture for all students. A digital age learning culture includes the following five subcategories: innovation focused on continuous improvement, use of technology for learning, learner-centered environments, use of technology across the curriculum, and participation in global collaboration (ISTE, 2012). Hughes and Burke (2014) agreed the role of the principal as technology leader involves providing environments equipped with the appropriate technology and resources to address the diversity of student learning needs.

ISTE standard–excellence in professional practice. Principals as technology leaders are expected to promote and support excellence in professional practice through appropriate professional development and fostering professional learning and innovation (ISTE-A, 2012). Research has established that high quality professional development is necessary to ensure the effective use of technology in schools (Metcalf & LaFrance, 2013; Penuel, 2006; Richardson, McLeod et al, 2013). Toward that end, Zhong (dissertation 2016) found through her research that the ability to ensure quality professional development for teachers was the most critical component of a technology leader.

ISTE standard–systemic improvement. According to ISTE (2012) principals as technology leaders must demonstrate proficiency in systemic improvement. Systemic

improvement is defined by ISTE as the ability of the principal to measure the effectiveness of their school and the 1:1 initiative, and then on a regular basis apply the same measurement to guarantee continuous improvement.

ISTE standard–digital citizenship. Principals as technology leaders must demonstrate the skills to lead their staff members and students in digital citizenship. “Digital citizenship refers to the behavior, knowledge and skills that people should demonstrate when interacting with digital tools” (ISTE 2012). In a study by Metcalf and LaFrance (2013), principals indicated they had the highest level of preparation in digital citizenship. However, in research conducted by Macaulay (2010) and Grey-Bowen (2010), principals indicated leadership regarding the social, legal and ethical issues of digital citizenship received the lowest scores.

The International Society for Technology Education standards for administrators are rigorous. The review of literature indicated that school principals who were involved in the planning, staff development and implementation of a technology initiative would have more knowledge and capacity to reach the highest level of the standards than principals who were not involved in the planning and implementation of the initiative in their school building.

Another tool that clearly identifies the technology knowledge and skills a principal must possess is the Principals Technology Leadership Assessment. The Principals Technology Leadership Assessment (PTLA) is an instrument developed by the Center for the Advanced Study of Technology Leadership in Education (CASTLE) to assess a principal’s technology leadership competency based on the ISTE-A standards. Research by Brunson (2015), examined PTLA results and determined that principals with the transformational leadership style were predicted to have strong technology leadership competency.

The transformational leadership model developed by Kenneth Leithwood (1994) was designed on the work of Burns (1978), Bass (1985) and Bass and Avolio (1994). The behavior of transformational leaders was comprised of four characteristics: individual consideration, intellectual stimulation, inspirational motivation, and idealized influence (Bass, 1985). Sosik and Dionne (1997) labeled these characteristics as the “Four I’s” of transformational leadership. Herold, Fedor and Caldwell (2008) found transformational leadership skills were positively related to an employee’s commitment to change and may prove to be essential skills for school administrators to meet the challenges of the 21st century as well as the challenges of leading second-order change.

Principals must be skilled at providing individual attention to staff members, helping staff members consider old problems in new ways, communicate high expectations and model the skills and behavior expected from staff (Marzano et al., 2005). The review of literature suggested that principals who are responsible for guiding a 1:1 technology initiative must clearly possess an extraordinary set of skills and be committed to maintaining those skills.

Principal as Leader of Change

According to Larry Cuban, educational change can be categorized as incremental or fundamental (Cuban, 1992, 1996). The terms incremental and fundamental are rooted in the concepts of first and second order change originally defined in 1974 by Watzlawick, Weakland, and Fisch (Cuban 1992, 1996).

Incremental change is defined as improving the efficiency of an existing structure otherwise known as “tinkering” (Cuban, 1992). Incremental change is considered a first order change. In a technology environment, an incremental change could be illustrated through the use

of a new technology application to complete a traditional task. For example, rather than of using Microsoft Word to write an essay, students could use Google Docs. In his book *Deep Change*, Robert Quinn stated,

Incremental change is limited in scope and is often reversible. If the change does not work out, we can always return to the old way. Incremental change usually does not disrupt our past patterns—it is an extension of the past. Most important, during incremental change, we feel we are in control.”

Fundamental change, on the other hand, is defined as change that is intended to permanently alter the structure or framework of a system (Cuban, 1996). Fundamental change was considered a second order change, a new way of seeing things and is irreversible. Once begun, it is impossible to return to the way of previously doing things. Fundamental change involves real or perceived risks and often involves surrendering some control (McRel, 2016). Pautz and Sadera (2017) stated that in a school where a culture of teacher-centered instruction is the norm, the shift to a 1:1 technology initiative and learner-centered instruction is a second-order, fundamental change.

“There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things.” (Niccolo Machiavelli).

School leadership is complicated and multi-faceted. In addition to daily managerial responsibilities, an effective principal is also held accountable for creating demand and building buy-in, while implementing and institutionalizing any number of first and second order district change initiatives (Marzano et al., 2005). To successfully lead change involving a 1:1 technology

initiative, the principal must have personal acceptance of the initiative and also possess a defined set of leadership skills (Courville, 2011).

Technology leadership is often viewed within the framework of change leadership due to its focus on innovation and the rapidly changing landscape of educational technology (Schrum & Levin, 2009). Fullan (2007) argued that innovations were adopted and school culture was transformed through the change process. Change is the process of initiation, implementation, and institutionalization, and the principal leads the change “on the ground” (Fullan, p. 156).

John Kotter, often recognized as an expert on leadership and change, in his book *Leading Change* (1996), described an eight-stage process for change originally designed as a business model which has been widely adopted in education. The eight stages include, initially creating a sense of urgency, followed by creating a guiding coalition, creating a vision for change, communicating the vision, removing obstacles, generating short term wins, building on the change, and anchoring the change in the culture. The following diagram depicts the stages adapted for an educational technology initiative in the Pelican Rapids School District in Minnesota (2013).



Marzano et al. (2005) examined the role of the principal as a leader of change. In *School Leadership that Works*, the authors articulated seven leadership responsibilities that correlated with successful second-order change facilitation. These responsibilities included change agent; flexibility; ideals and beliefs; intellectual stimulation; knowledge of curriculum, instruction and assessment; monitor and evaluate; and optimizer. Marzano et al. (2005) noted second order change initiatives are more likely to succeed when principals are able to focus on those seven specific responsibilities.

In 2005, Marzano et al. published a synthesis of 35 years of research on educational leadership. The analysis supported the conclusion that “school leadership has a substantial effect on student achievement and provides guidance for experienced and aspiring administrators alike” (Marzano et al., 2005 p. 12). In their publication, Marzano et al 2005 identified 21 leadership responsibilities including affirmation, change agent, contingent rewards, communication, culture, discipline, flexibility, focus, ideals/beliefs, input, intellectual stimulation, involvement in curriculum, instruction and assessment, knowledge of curriculum, monitoring/evaluating, optimizer, order, outreach, relationships, resources, situational awareness, and visibility. Those responsibilities were determined to be necessary to support both first-order and second order change.

Pautz and Sadera (2017) stated, “In a one-to-one initiative, when a culture of teacher-centered instruction is prevalent, the shift to 1:1 computing and learner-centered pedagogies is a second-order change.” A 1:1 technology initiative is commonly considered a second order change. Such change requires a specialized set of leadership skills for successful implementation.

School leadership matters when a school or district is considering a technology initiative (Anderson & Dexter, 2005), and principals must be increasingly involved in the project to model and support implementation (Anthony & Patravani, 2014; Stuart et al., 2009). If a school is lacking the buy-in of the building leader, it is unlikely a change initiative will be successful. Leithwood & Riehl (2005) agreed that leadership is the most important factor in effective school change.

In *School Leadership that Works* (2005), Marzano et al. described a variety of school leadership styles and the twenty-one most impactful responsibilities of a school leader. Since, implementing a 1:1 technology initiative is often considered a second-order change, according to Marzano et al. these initiatives are more successful when leaders focused on the seven responsibilities correlated with successful second-order change (knowledge of Curriculum, Instruction, and Assessment, Optimizer, Intellectual Stimulation, Change Agent, Monitoring and Evaluating, Flexibility, Ideals and Beliefs). A principal demonstrating competency in Knowledge of Curriculum, Instruction and Assessment (CIA) prior to a 1:1 initiative would presumably be knowledgeable on current 1:1 technology research, trends and theory. A principal displaying competency as an effective Optimizer, would share an optimist's view of the initiative with staff and a vision of what could be accomplished in the future. A principal demonstrating leadership competency in Intellectual Stimulation during a 1:1 initiative would be responsible for the professional development of the staff as determined by current research and best practices. As a Change Agent, a principal would be comfortable, willing and successful in challenging long-standing school practices that may be incongruent with the 1:1 technology initiative. Effective Monitoring and Evaluating would require the principal to provide feedback to teachers, while

Flexibility would require an ability to adapt leadership style to the demands of a current situation. The last principal competency Marzano et al identified as critical for successful second-order change was Ideals and Beliefs. This would involve leading from a professionally articulated set of ideals and beliefs. Inherent in these seven principal competencies is the critical need to be involved in the visioning, development and implementation of a 1:1 technology initiative (Marzano, 2005).

Marzano et al. (2005) stated that the principal responsibilities regarding school culture, communication, order and input are all negatively impacted by second-order change. This research adds to the known complexity and burden placed on school principals during implementation of a 1:1 technology initiative. Principals involved with planning the 1:1 initiative and recipients of technology focused staff development are better prepared to carry out a successful second-order change.

Professional Development

Research revealed that the lack of technology training for principals is a major challenge for school leaders (Flanagan & Jacobsen, 2003; Schiller, 2003; Sincar, 2013; Thomas & Kzenek, 1991; Wang, 2010). McLeod stated, “the great sin in the way professional development is provided (to principals) in this country is one of omission. Most of our school leaders have received no training what so ever” (Fletcher, 2009, p. 22). Technology skills are rarely addressed in current educational leadership programs (Dexter, 2008; Redish & Chan, 2007). Thomas and Kzenek identified administrator technology training as a necessity for a technology innovation to succeed in a school. When school leaders are inexperienced with technology and the impact it

may have, principals are less likely to be effective in changing their schools and effectively leading technology initiatives.

Professional training for principals implementing technology initiatives in schools large enough to have multiple classrooms is crucial for successful support, facilitation, communication, sustainability and other technology leadership behaviors (Baskin & Williams 2006; McLeod & Richardson, 2011). In 2002, Youngs and Kim determined a positive school climate was enabled when a principal provided technology professional development. In addition, the conditions must exist to address the varying levels of teachers' technology knowledge. Otherwise program coherence, professional learning communities, and improved teacher practices are less likely to occur. In 2000, Ford noted that staff development, training and the ability to provide appropriate resources for staff were the most important competencies of a technology leader. Thus, for successful 1:1 technology initiatives, the quantity and quality of principal professional development must be addressed.

Change must be modeled and championed from the top of all organizations. While all levels of district leadership are critical, the building principal is the primary influence of professional development within a school (Greaves, 2012).

The need for professional development on new technologies is well documented. Missouri's state initiative, Enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS) program requires teachers to participate in a 2-year professional development program that extends beyond skills training (eMINTS, 2004). Former Virginia superintendent of schools believed professional development was crucial to the success of the district's 1:1 program and stated, "At the heart of our laptop program is a firm commitment to teacher

training. Embracing the concept of a learning community means giving teachers the skills and tools they need to be effective” (Laptops for Learning, 2004, p. 8). Neither of these large state technology initiatives addressed professional development beyond the initial implementation phase. The review of literature revealed that neither state addressed the principal’s role in sustaining the technology skills of the returning teaching staff as well as the training of new teachers.

Chapter Summary

Research on the principal’s role in a 1:1 technology initiative is extremely limited. Nonetheless, numerous researchers and experts on leading change and the roles of principals leading technology initiatives identify the necessity of principals displaying similar skills and responsibilities. Principals must provide vision and model their personal use of technology. Principals must establish a positive school culture and prepare staff to embrace change. Professional development for the principal and staff must be well planned and clearly articulated. These necessary skills and responsibilities for successful technology initiatives are supported by the ISTE-A (2009) standards, research by Marzano (2005), McLeod and Richardson (2011), Ford (2000), and many others.

The success of a 1:1 technology initiative is associated with the leadership of the building principal (Brunson, 2015). Researchers investigating school leadership agree principals must be involved in the planning of an initiative to support implementation (Anderson & Dexter, 2005; Anthony & Patavanich, 2014; Stuart, Mills, & Remus, 2009). The review of literature suggested leaders pursuing a 1:1 technology initiative must be able to successfully manage first and second order change.

The International Society for Technology Education (ISTE) Standards, Principal Technology Leadership Assessment, and Marzano's 21 Leadership Responsibilities share several common leadership characteristics. The common characteristics include similar skills, responsibilities, and necessary conditions for effective initiative implementation including quality teacher staff development.

Chapter 3: Methodology

Introduction

Since 2001 and the enactment of Public Law 107-110, also known as the No Child Left Behind Act, the pressure on school districts to improve student outcomes has significantly increased (NCLB. Section. 1001.). As school and school district programs evolved their instructional approach from one textbook for each student to one mobile device for each student, so has principal leadership changed from an approach with which leaders were familiar to one which was considerably more complex and unfamiliar. In a rapidly changing technology environment, this change in approach introduced new responsibilities for and pressures on school principals.

The new responsibilities for principals as instructional leaders of 1:1 technology initiatives include understanding emerging technological applications. Despite the fact that educators tend to limit the number of applications they regularly use, the introduction of new educational applications is continuous and escalating (Number of mobile app downloads, n.d.). According to Apple, there were 80,000 available education applications on the market, including 2472 new applications that were distributed in May 2016 (Sensortower.com). Clearly, principal knowledge about contemporary technology applications as well as responsibility for staff orientation and retraining in the area of technology could be beyond the capabilities of principals. The study intends to address the perceived involvement and responsibilities of Minnesota elementary school principals with 1:1 technology initiatives in their schools.

Purpose

The purpose of the study was to examine the perceptions of a sampling of Minnesota elementary school principals on the extent, value and quality of their involvement in the implementation of their school districts' 1:1 technology initiatives. Furthermore, the study intended to ascertain the sample group principals' perceived preparedness to provide leadership and training to their schools' teaching staffs, (including staff employed one or more years following initial implementation of a 1:1 initiative), regarding their school districts' technology initiatives.

Research Questions

The study's five research questions were developed to ascertain the perceptions of a sampling of Minnesota elementary school principals on the extent, value and quality of their involvement in the implementation of their school districts' 1:1 technology initiatives.

1. How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
2. How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
3. How did a select sample of Minnesota elementary school principals rate the quality and value of the staff development provided by their school districts related to their 1:1 technology initiatives?

4. How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiatives in their school buildings?
5. How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on their school districts' 1:1 technology initiatives?

Participants

The study participants included elementary school principals who were current members of the Minnesota Elementary Principal's Association (MESPA) and were employed in school districts that had implemented 1:1 technology initiatives.

At the time of the study, the study population of Minnesota elementary school principals was 857 according to the Minnesota Department of Education, and 703 were members of the Minnesota Elementary School Principals Association (MESPA). The researcher anticipated a sample size of fifty current MESPA members. Since 115 Minnesota elementary school principals agreed to participate in the study, the researcher concluded the data gathered and analyzed would be generalizable across all schools and school districts implementing 1:1 technology initiatives in Minnesota elementary schools.

Human Subject Approval-Institutional Review Board

Prior to data collection, the researcher completed the required training involving human subjects through St. Cloud State University on March 24, 2018.

The researcher's doctoral committee granted approval of the preliminary study design on March 21, 2018. The study design was transmitted to the Instructional Review Board (IRB) on

April 3, 2018. The researcher received final approval from the IRB on April 19, 2018. The IRB approval document is included as (see Appendix A).

Respondents will be notified that their participation in the study is voluntary and their responses will remain anonymous.

Instruments for Data Collection and Analysis

A survey and optional interview were used to gather perceptual information from Minnesota elementary school principals who were employed in school districts that had implemented 1:1 technology initiatives. Of the 115 elementary principals who participated in the 1:1 Technology Survey in April 2018, 31 principals volunteered to participate in follow-up interviews in May 2018.

The study's quantitative instrument consisted of an 11-question online survey. SurveyMonkey was the vehicle used to disseminate the survey instrument and gather the results.

The first instrument question was a disqualifying question, which immediately exited select respondents from the survey following a response of no. The disqualification question was, "Does your school/district have a 1:1, 1:2 or BYOD at the elementary level"? The subsequent nine questions focused on ascertaining the principals' perceptions of their involvements in the implementation of 1:1 technology initiatives, as well as their perceived preparedness to lead the initiatives and provide ongoing staff development to newly hired teachers. The nine questions employed Likert rating scales with responses ranging from none to extensive. The time required by respondents to complete the online survey was estimated to be 1-5 minutes.

Respondents will be informed that their participation in the study/survey was voluntary. Respondents could discontinue responding at any time in the survey if they wish to do so. All responses and data were confidentially maintained.

The second instrument was a two-question interview conducted with principals who volunteered after completing the initial survey. Data were secured through individual interviews of five elementary school principals to examine in greater detail the principals' experiences with a 1:1 technology initiative. The follow up interviews consisted of two questions included on the original online survey. The interviews were recorded and transcribed. The interviews were electronically recorded and the recordings were destroyed following completion of the study. The transcription is included in Chapter 4.

The survey results were subsequently compiled by St. Cloud State University's Center for Statistics. The results of the survey were confidential and available only for examination by the researcher.

Research Design

1. The design of the study included gathering both quantitative and qualitative data.

According to Creswell and Clark (2011) acquiring both quantitative and qualitative data in a single study "provides a better understanding of research problems than either approach alone" (p. 271).

2. The quantitative techniques employed in the research design include data collection and analysis of those data gathered through a survey instrument.

3. The quantitative survey component was comprised of the administration of an online survey instrument to current Minnesota elementary school principals employed in school districts which had implemented 1:1 technology initiatives.
4. Respondents were surveyed through the use of a SurveyMonkey instrument.
5. The use of a survey was to optimize the greatest number of respondents as possible for the study.
6. The interview option for volunteer participants was used to gain deeper understanding of responses.
7. The qualitative techniques included narratives from select elementary school principals who provided general and focused detail of their perceptions and experiences with 1:1 technology implementation.
8. As Slavin (2007) stated, quantitative research is used when researchers collect numerical data from individuals or groups and through an analysis “determine whether there are relationships among them” (p. 7).

Procedures and Timeline

Since the research design included quantitative and qualitative data to address the research questions, approval of the researcher’s study and survey were secured from St. Cloud State University.

Subsequently, the researcher contacted the executive director of MESPA to seek approval to distribute the study’s electronic survey to all current MESPA members by email during April 2018. Approval to distribute the survey in this manner was attained in May 2017.

The researcher allowed 2 weeks for respondents to complete the survey. Subsequently, the researcher sent two reminders to respondents to complete survey instrument. Following electronic survey completion, the researcher intended to interview five principals who volunteered to participate in the follow-up, qualitative interview. Respondents indicated their willingness to participate in an interview on the electronic survey and were contacted and interviewed by telephone. Telephone interviews were recorded. Interviewees were informed that the interviews would be recorded. Anonymity to the respondents was guaranteed. Recordings were analyzed for the study and destroyed following publication of results. Thus, the researcher anticipates data collected by May 2018.

The Statistical Consulting Center at St. Cloud State University supported the researcher through processing the data received from SurveyMonkey in April and May 2018.

Summary

Chapter 3 presents the study's research methodology including the introduction, purpose, research questions, participants, human subject approval, methods for data collection and analysis, research design, as well as procedures and timeline. The quantitative data were obtained through the use of a survey, while the qualitative data entailed select individual interviews. Chapter 4 describes the results of the study organized by research questions, as well as data obtained from individual interviews included to enhance the results obtained from the survey instrument.

Chapter 4: Research Findings

Introduction

Following the enactment of Public Law 107-110 in 2001 (NCLB) and the implementation of sanctions on school districts for failing to achieve minimum proficiency standards, 1:1 technology initiatives were increasingly adopted as one vehicle for increasing student achievement. The influx of classroom technology was rapid, and accelerated with the introduction on the Apple iPad.

Educational leaders have praised technology integration as the most impactful classroom tool for transforming teaching and learning this century (Blackboard, 2012; Center for Digital Education, 2011), resulting in the need to understand the building leaders' perceptions of implementation.

The purpose of the study was to gather the perceptions of a sampling of Minnesota elementary principals on the extent, value and quality of their involvement in the implementation of their school districts' technology initiatives. In addition, the study investigated the sample group principals' perceived preparedness to provide ongoing leadership and training to their schools' teaching staffs regarding their school districts' technology initiatives.

Chapter 4 is organized by research question findings, followed by interview findings and summary. The study provided information for school district leaders and elementary principals who may be considering the implementation of 1:1 technology initiatives.

Research Questions

The following research questions directed the study:

1. How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
2. How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
3. How did a select sample of Minnesota elementary school principals rate the quality and value of the staff development provided by their school districts related to their 1:1 technology initiatives?
4. How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiatives in their school buildings?
5. How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on the school districts' 1:1 technology initiatives?

Survey Results: Participant Demographics

At the time of the study, the study population of Minnesota elementary school principals was 857 according to the Minnesota Department of Education. The study survey was distributed to the 703 active members of the Minnesota Elementary Principal's Association through the Association's weekly E-News, and distribution occurred on April 26, 2018 and May 3, 2018. Following email requests to Minnesota Elementary Principal's Association division leaders on

May 9, 2018, the researcher had received 115 completed survey responses. The survey sample represented 16.4% of active MESPA members.

Findings: Presence of a 1:1 Technology Initiative

The study focused on principals who work in school districts that had implemented 1:1, 1:2 or BYOD technology initiatives at the elementary school level. Of the 115 elementary principal survey respondents, 65 or 58.0% responded affirmatively that their school districts or elementary schools had implemented 1:1, 1:2 or BYOD initiatives. Table 1 illustrates the number of respondents whose schools or districts had implemented 1:1, 1:2, or BYOD technology initiatives.

Table 1

Principal Responses to the Presence of a 1:1 Technology Initiative

Q.1 Does your school have a 1:1 initiative at the elementary level?		
Yes	65	56.5%
No	47	40.9%
Skipped	3	2.6%
Total	115	100%

Findings: Years of Implementation of 1:1 Technology Initiative

Each principal respondent was asked to identify the length of time his or her school district or elementary school had participated in a 1:1, 1:2 or BYOD initiative. The years of implementation options included 0 -2 years, 3-5 years, 6-8 years, and 9 or more years. Table 2 data revealed that 25 respondents or 36.8% indicated their school districts or schools had

operationalized their 1:1 initiatives between 0-2 years, 38 respondents or 55.9% stated their school districts or schools had operationalized their 1:1 initiatives between 3-5 years, while five respondents or 7.4% indicated their school districts or schools had operationalized their 1:1 initiatives between 6-8 years.

Table 2

Principal Responses to the Number of Years of 1:1 Initiative

Q.2 How many years has school had 1:1 technology initiative?	N	Percentage of respondents
0 – 2 years	25	36.8%
3 – 5 years	38	55.9%
6 – 8 years	5	7.4%
9 or more years	0	0
Total	65	

The number of responses to each question varied due to the fact a respondent could skip over a question in the survey. Table 3 indicates the number of respondents for each question. One principal answered yes to having a 1:1 technology initiative but did not answer any more questions. The number of responses varied for each question. Of the 65 principals responding affirmatively to having 1:1 technology initiatives, some questions had 64 respondents and some had 61 respondents, and 31 principals volunteered to be interviewed.

Table 3

Number of Responses by Question

Survey Question	N
Q.1 Does your school have a 1:1 technology initiative?	115
Q.2 How many years has your school had a 1:1 technology initiative?	64
Q.3 To what extent would you rate your involvement in planning?	64
Q.4 To what extent would you rate your involvement in implementing?	64
Q.5 To what extent would you rate the quality of your involvement in planning?	64
Q.6 To what extent would you rate the quality of your involvement in implementing?	64
Q.7 To what degree would you rate the value of staff development?	61
Q.8 To what degree would you rate your preparedness to provide building wide leadership?	61
Q.9 To what degree would you rate your preparedness to provide training to newly hired teachers?	61
Q.10 Would you be willing to participate in a follow up interview?	31

Survey Results for Research Question 1: Extent of Involvement in Planning and Implementation

How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school districts' 1:1 technology initiatives?

The purpose of the research question was to determine responding elementary principals' perceptions of their involvement in planning and implementing their school districts' 1:1 technology initiatives. Principal participants were asked to rate the extent of their involvement in planning for the districts' technology initiatives and also the extent of their involvement in

implementing the technology initiatives. Principals rated their responses on a four-point Likert scale with response options of none (no involvement in planning), very little, some or extensive involvement in planning for the school districts' 1:1 technology initiatives.

In an analysis of the response data on principal involvement in planning for their districts' or schools' technology initiatives, it was reported that 50 of 64 respondents or 78.1% perceived some or extensive involvement in planning the technology initiatives, with 26 respondents or 40.6% having perceived "some" involvement and 24 or 37.5% respondents having perceived "extensive" involvement in planning their initiatives. Table 4 data further reveal that nine respondents or 14.1% perceived very little and five respondents or 7.8% perceived no involvement in planning their school districts' or schools' technology initiatives.

Table 4

Principals Involvement in Planning 1:1 Technology Initiatives

To what extent would you rate your involvement in planning for your district/school's 1:1 technology initiative?	N	Percentage of respondents
None	5	7.8%
Very Little	9	14.1%
Some	26	40.6%
Extensive	24	37.5%
Total for Q.3	64	100%

Table 5 displays the results of principal perceptions of the extent of their involvement in planning 1:1 initiatives by years of implementation. Respondents were requested to rate their levels of involvement in planning their school districts' or schools' technology initiatives as none, very little, some or extensive.

The data revealed 23 respondents or 35.9% cited that their schools had 0-2 years of experience with 1:1 technology initiatives, while 41 principals or 64.1% had more than 2 years' of experience with 1:1 initiatives. Table 5 reports that 16 of the 23 respondents or 69.6% with 0-2 years of years of experience with 1:1 initiatives perceived a level of some or extensive involvement in planning their initiatives, while 34 of 41 respondents, or 82.9% with more than two years' experience with 1:1 initiatives perceived they had some or extensive involvement in planning. In addition, 100.0% of principals with 0-2 years of experience with their 1:1 initiatives perceived at least a minimal or greater level of involvement in planning, while 87.8% of principals with more than two years' of experience with their initiatives perceived at least a minimal or greater level of involvement in planning. At the same time, however, it should be noted that seven of 23 or 30.4% of respondents who were involved with initiatives that were in place 0-two years of years perceived they had little involvement in planning their initiatives.

Table 5

Principals' Perceptions of Involvement in Planning 1:1 Technology Initiatives by Years of Implementation

To what extent would you rate your involvement in planning for your district/school's 1:1 technology initiative?	0-2 year of 1:1	More than 2 years of 1:1
None	0	5
Very Little	7	2
Some	8	18
Extensive	8	16
Total	23	41

Elementary principal participants were asked to rate the extent of their involvement in implementing technology initiatives in their school districts. Table 6 details that 55 respondents or 85.9% perceived some or extensive involvement in implementing their school districts' technology initiatives, 33 principals having perceived some levels of involvement in implementing their technology initiatives and 22 principals having perceived extensive involvement in implementing their initiatives. Table 6 data further establish that seven respondents or 10.9% perceived very little and two respondents or 3.1% perceived no involvement in implementing their school districts' technology initiatives.

Table 6

Principal Involvement in Implementing 1:1 Technology

To what extent would you rate your involvement in implementing for your district/school's 1:1 technology initiative?	N	Percentage of respondents
None	2	3.1%
Very Little	7	10.9%
Some	33	51.6%
Extensive	22	34.4%
Total for Q.3	64	100%

Table 7 displays the results of principal perceptions on the extent of their involvement in implementing 1:1 initiatives by years of experience with their initiatives. The respondents rated their involvement in implementation of their schools' or school districts technology initiatives as none, very little, some or extensive. As shown in Table 2, survey data revealed that 23 of 64 respondents or 35.9% stated their schools had 0-two years of experience with 1:1 technology initiatives, and 41 respondents or 64.1% had more than two years' experience with 1:1 initiatives. Seventeen of the 23 respondents or 73.9% with 0-2 years of experience with 1:1 initiatives perceived they had some or extensive involvement in implementing the initiatives, while 38 of 41 respondents, or 92.7% with more than two years' experience with 1:1 initiatives perceived they had experienced some or extensive involvement in implementation. However, 6 of 23 respondents or 26.1% with 0-2 years of experience with 1:1 initiatives stated they had had very little involvement in implementing their school districts' technology initiatives.

Table 7

Principals' Perceptions of Involvement in Implementing 1:1 Technology

To what extent would you rate your involvement in implementing for your district/school's 1:1 technology initiative?	0-2 years of 1:1 implementation	More than 2 years of 1:1 implementation
None	0	2
Very Little	6	1
Some	8	25
Extensive	9	13
Total	23	41

*Technology initiatives by Years of Implementation

Survey Results for Research Question 2: Perceived Quality of Involvement in Planning and Implementation

How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives?

The purpose of the research question was to determine responding elementary principals' perceptions of the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives. Principal participants were asked to rate the quality of their involvement in planning for the districts' technology initiatives and also the quality of their involvement in implementing the technology initiatives. Principals rated their responses on a four-point Likert scale with response options of none, low, moderate or high quality of involvement.

In an analysis of the response data on the quality of a principals' involvement in planning for their districts' or schools' technology initiatives, it was reported that 49 of the 64 responses or 76.6% perceived a moderate or high degree of quality to their involvement in planning the

technology initiatives, while 34 respondents or 53.1% having perceived a moderate degree of quality to their involvement in planning their technology initiatives and 15 respondents or 23.4% having perceived a high degree of quality to their involvement in planning the initiatives. Table 8 data further revealed that 15 respondents or 23.4% perceived either no quality in their involvement in planning or a low quality of involvement in planning their school districts' or schools' technology initiatives.

Table 8

Principals' Quality of Involvement in Planning 1:1 Technology

To what degree would you rate the quality of your involvement in the planning for your district/school's 1:1 technology initiative?	N	Percentage of respondents
None	5	7.8%
Low	10	15.6%
Moderate	34	53.1%
High	15	23.4%
Total for Q.5	64	100%

Table 9 displays the results of principal perceptions on the quality of their involvement in planning 1:1 initiatives by years of experience with those initiatives. The respondents rated their quality of involvement in planning their schools' or school districts' technology initiatives as none, low, moderate or high. Table 9 data reveal that 23 of 64 respondents or 35.9% stated their schools had 0-2 years of experience with 1:1 technology initiatives, and 41 respondents or 64.1% had more than 2 years' experience with 1:1 initiatives.

Table 9 illustrates 15 of the 23 respondents or 65.2% with 0-two years of experience with 1:1 initiatives perceived a moderate or high level of quality of involvement in planning their initiatives, while 34 of 41 respondents or 83.0% with more than 2 years' experience with 1:1 initiatives perceived a moderate or high level of quality of involvement in planning their initiatives. However, eight of 23 respondents or 34.8% of principals, greater than 1 in 3, with 0-2 years of experience with 1:1 initiatives indicated there was no quality or low quality of involvement in planning their schools' or school districts' 1:1 initiatives, and seven of 41 respondents or 17.1% with more than 2 years' of experience with technology initiatives perceived no quality or low quality to their involvement in planning their schools' or school districts' initiatives.

Table 9

Principals' Perceptions of the Quality of Involvement in Planning 1:1 Technology

To what degree would you rate the quality of your involvement in the planning for your district/school's 1:1 technology initiative?	0-2 years of 1:1	More than 2 years of 1:1
None	1	4
Low	7	3
Moderate	9	25
High	6	9
Total	23	41

*Technology initiatives by Years of Implementation

Elementary principal participants were asked to rate the quality of their involvement in implementing technology initiatives in their schools or school districts. Table 10 details that 53 of 64 of all respondents or 82.8% indicated a moderate or high quality of involvement in implementing their school districts' technology initiatives, while 34 or 53.1% principals

indicated a moderate quality to their involvement in implementing their schools' or school districts' technology initiatives and 19 principals or 29.7% perceived a high quality of involvement in implementing their schools' or school districts' initiatives. Table 10 data further establish that eleven respondents or 17.2% perceived their involvement in implementation of their schools' or school districts' technology initiatives as none or low quality in regards to their involvement in implementing their schools' or school districts' technology initiatives.

Table 10

Principals' Perceptions of the Quality of their Involvement During Implementation

To what degree would you rate the quality of your involvement in the implementation for your district/school's 1:1 technology initiative?	N	Percentage of respondents
None	4	6.3%
Low	7	10.9%
Moderate	34	53.1%
High	19	29.7%
Total for Q.5	64	100%

Table 11 displays the results of principal perceptions of the quality of their involvement in implementing 1:1 initiatives by years of experience with the initiatives. The respondents rated the quality of their involvement in implementation of their schools' or school districts' technology initiatives as none, low, moderate or high. Table 11 data reveal that 23 of 64 respondents or 35.9% stated their schools had 0-2 years of experience with 1:1 technology

initiatives, and 41 respondents or 64.1% had more than 2 years' of experience with 1:1 initiatives. Table 11 data show 18 of the 23 respondents or 78.3% with 0-2 years of experience with 1:1 initiatives perceived they had a moderate or high level of quality of involvement in implementing their initiatives, while 35 of the 41 respondents or 85.4% with more than 2 years' experience with 1:1 initiatives perceived they had a moderate or high level of quality of involvement in implementing their initiatives.

However, 5 of 23 respondents or 21.7% with 0-2 years of experience with 1:1 initiatives, greater than one in five principals, perceived no quality or low quality to their involvement in implementing their initiatives, while six of 41 respondents or 14.6% with more than 2 years' of experience with 1:1 initiatives perceived no quality or low quality of their involvement in implementing their schools' or school districts' technology initiatives.

Table 11

Principals' Perceptions of the Quality of Involvement in Implementation of 1:1 Technology

To what degree would you rate the quality of your involvement in the implementation for your district/school's 1:1 technology initiative?	0-2 years of 1:1	More than 2 years of 1:1
None	1	3
Low	4	3
Moderate	8	26
High	10	9
Total	23	41

* Technology Initiatives by Years of Implementation

Survey Results for Research Question 3: Value of Staff Development

How did a select sample of Minnesota elementary school principals rate the value of the staff development provided by their school districts related to their 1:1 technology initiatives?

The purpose of the research question was to determine responding elementary principals' perceptions of the value of the staff development provided by their school districts related to 1:1 technology. Principal participants were asked to rate the value of their districts' staff development regarding to their 1:1 technology initiatives. Principals selected responses on a four-point Likert scale from among the following four options: none, low, moderate or high.

Analysis of the response data on the perceived value of district provided staff development on their 1:1 technology initiatives revealed, 61 of 61 respondents or 100% related that there was some value to the district provided staff development. Table 12 data revealed that 51 of 61 respondents or 83.6% attributed a moderate or high value to the district provided staff development with 17 of 61 respondents or 27.9% having perceived a high value to the district provided staff development and 34 of 61 respondents or 55.7% having perceived a moderate value to the district provided staff development. Table 12 data further revealed that 10 respondents or 16.4% attributed a low value to the district provided 1:1 technology staff development.

Table 12

Perceived Value of District Provided Staff Development

To what degree would you rate the value of the staff development provided by your district/school in regards to the 1:1 technology initiative?	N	Percentage of respondents
None	0	0%
Low	10	16.4%
Moderate	34	55.7%
High	17	27.9%
Total for Q.5	61	100%

Table 13 displays the results of principal perceptions of the value of the staff development provided by their districts for implementing 1:1 technology initiatives by years of implementation. Respondents were requested to rate their perceived value of district provided staff development in preparation for their school districts' or schools' technology initiatives as none, low, moderate or high. Table 13 reveals 22 respondents or 36.0% cited that their schools had 0-2 years of experience with 1:1 technology initiatives, while 39 principals or 63.9% reported having more than two years experience with 1:1 initiatives.

Table 13 reports that 17 of 22 or 77.3% of principals with 0-two years of experience with 1:1 initiatives perceived the district provided staff development as having moderate or high value, while 34 of 39 or 87.2% of principals with more than 2 years' experience with 1:1 initiatives perceived a moderate or high value of district provided staff development. In addition, 5 of 22 respondents or 22.7% with 0-2 years of experience with 1:1 initiatives, greater than one

in five responders, perceived the staff development as having low value, while 5 of 39 or 12.8% of principals with more than 2 years of experience with 1:1 initiatives perceived district provided staff development as having low value. All principals with more than 2 years' of experience with 1:1 initiatives perceived some value to the staff development provided by their districts or schools.

Table 13

Principals' Perceptions of the Value of District Provided Staff Development for 1:1 Technology Initiatives

To what degree would you rate the value of the staff development provided by your district/school in regards to the 1:1 technology initiative?	0-2 years of 1:1	More than 2 years of 1:1
None	0	0
Low	5	5
Moderate	11	23
High	6	11
Total	22	39

* Technology Initiatives by Years of Implementation

Survey Results for Research Question 4: Preparedness to Provide Leadership and Training

How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiatives in their school buildings?

The purpose of the research question was to determine responding elementary principals' perceptions of their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiatives. Principal participants were asked to rate their preparedness

to provide leadership on the 1:1 technology initiatives on a four-point Likert scale with response options of none, very little, some or extensive preparedness.

In an analysis of the response data on a principals' preparedness to provide leadership for their districts' or schools' 1:1 technology initiatives, 61 of 61 respondents or 100% responded they had some degree of preparedness to provide staff leadership on technology initiatives. It was determined that 51 of 61 respondents or 83.6% indicated some or an extensive degree of preparedness in providing leadership to their staffs on 1:1 technology initiatives with 41 respondents or 67.2% perceiving some preparedness for 1:1 technology leadership and 10 respondents or 16.4% perceiving an extensive degree of preparedness to provide staff leadership in 1:1 technology initiatives. Data revealed 10 respondents or 16.4% reported they were prepared very little to provide leadership to their staffs on their school districts' 1:1 technology initiatives.

Table 14

Principals' Perceptions on Preparedness to Provide Leadership on 1:1 Technology Initiatives

To what degree would you rate your preparedness to provide building-wide leadership in regards to the 1:1 technology initiative?	N	Percentage of respondents
None	0	0%
Very Little	10	16.4%
Some	41	67.2%
Extensive	10	16.4%
Total for Q.5	61	100%

Table 15 displays the results of principal perceptions of their preparedness to provide building-wide leadership on 1:1 technology initiatives by years of implementation. Respondents were requested to rate their preparedness to provide building wide leadership in their schools' 1:1 technology initiatives as none, very little, some, or extensive. In so doing, 22 of 61 respondents or 36.0% cited that their schools had 0-2 years of experience with 1:1 technology initiatives, while 39 principals or 63.9% had more than 2 years' experience with 1:1 initiatives.

Table 15 reports that 17 of 22 respondents or 77.2% of principals with 0-2 years of experience with 1:1 initiatives perceived their preparedness to provide building-wide leadership of 1:1 initiatives as some or extensive, while 34 of 39 or 87.2% of respondents with more than 2 years' experience with 1:1 initiatives perceived their preparedness to provide building-wide leadership of 1:1 initiatives as some or extensive. Data also reveal that five of 22 or greater than 1 in 5 or 22.7% of respondents with 0-two years of experience with 1:1 initiatives and 5 of 39 or 12.8% of respondents with more than 2 years of experience with 1:1 initiatives had very little preparedness to provide building wide leadership. All principals perceived some level of preparedness to lead the initiatives.

Table 15

Principals' Perceptions on Preparedness to Provide Building-Wide Leadership for 1:1 Technology Initiatives

To what degree would you rate your preparedness to provide building-wide leadership in regards to the 1:1 technology initiative?	0-2 years of 1:1	More than 2 years of 1:1
None	0	0
Very little	5	5
Some	11	23
Extensive	6	11
Total	22	39

* Technology Initiatives by Years of Implementation

Survey Results for Research Question 5: Preparedness to Train Newly Hired Teachers

How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on the school districts' 1:1 technology initiatives?

The purpose of the research question was to determine responding elementary principals' perceptions of their preparedness to provide training to their newly hired teachers on their school districts' 1:1 technology initiatives. Principal participants were asked to rate their preparedness to provide training on their schools' or school districts' 1:1 technology initiatives to newly hired teachers on a four-point Likert scale with response options of none, very little, some or extensive preparedness.

Analysis of the response data on principals' preparedness to provide training to newly hired teachers revealed, that 44 of 61 respondents or 72.1% perceived some or an extensive degree of preparedness to provide 1:1 technology training to newly hired teachers with 39

respondents or 63.9% having perceived some preparedness for teacher training and five respondents or 8.2% perceived an extensive degree of preparedness to provide teacher training on their 1:1 technology initiatives. Table 16 data further illustrate that 17 of 61 respondents or 27.9%, greater than one in four principals, perceived they had very little or no preparedness to provide training to newly hired teachers on their school districts' 1:1 technology initiatives.

Table 16

Principals' Perceptions on their Preparedness to Provide Newly Hired Teachers Training in 1:1 Technology

To what degree would you rate your preparedness to provide training to newly hired teachers in regards to the 1:1 technology initiative?	N	Percentage of respondents
None	1	1.6%
Very Little	16	26.2%
Some	39	63.9%
Extensive	5	8.2%
Total for Q.5	61	100%

Table 17 displays the results of principals' perceptions of their preparedness to provide training to newly hired teachers on their school districts' 1:1 technology initiatives by years of implementation. Respondents were requested to rate their preparedness to provide training to newly hired teachers on their school districts' or schools' 1:1 technology initiatives as none, very little, some, or extensive.

The data revealed, 22 of 61 respondents or 36.0% cited that their schools had 0-2 years of experience with 1:1 technology initiatives, while 39 principals or 63.9% had more than 2 years' experience with 1:1 initiatives.

Table 17 reports that 17 of 22 respondents or 77.3% with 0-2 years of experience with 1:1 initiatives perceived their preparedness to provide training to newly hired teachers as some or extensive, while 27 of 39 respondents or 69.2% of principals with more than 2 years' experience with 1:1 initiatives perceived their preparedness to provide training to newly hired teachers as some or extensive. Table 17 data further illustrate that 5 of 22 respondents or 22.7%, nearly 1 in 4 principals with 0-2 years of experience with 1:1 technology initiatives, and 12 of 39 respondents or 30.8%, more than 3 in 10 principals with more than 2 years' experience with 1:1 initiatives, had very little or no preparedness to provide training to newly hired teachers on their school districts' initiatives.

Table 17

Principals' Perceptions on Preparedness to Provide Training to Newly Hired Teachers

To what degree would you rate your preparedness to provide training to newly hired teachers in regards to the 1:1 technology initiative?	0-2 years of 1:1	More than 2 years of 1:1
None	0	1
Very little	5	11
Some	15	24
Extensive	2	3
Total	22	39

* Technology Initiatives by Years of Implementation

Interview Results

The researcher conducted five telephone interviews with volunteer respondents to obtain additional information about their preparedness to provide building-wide leadership regarding 1:1 technology initiatives in their schools. There were three distinct themes that emerged related to principal preparedness to provide building-wide leadership. Those themes regarded conferences and workshops, relying on others, principal specific training.

Table 18 includes comments from the five interviewees specific to their preparedness to provide building-wide leadership on their school districts' 1:1 technology initiatives.

Table 18

Interviewee Comments Addressing Preparedness to Provide Building Leadership

Note: Interviewee responses to: “Can you tell me about your preparedness to provide building-wide leadership for your 1:1 technology initiative?”

Telephone Interview	Comments
Interviewee A:	<p>So I think really what I did as a school principal was rely on others who were passionate about technology.</p> <p>I guess mainly from a leadership standpoint it was trusting other people to find things and then bring it back to the school, and then I supported them with sharing it with staff.</p> <p>Staff and then through the DO and I'm thinking of, we would use Bruce, DO staff and tech department would say, “This is a really good presentations app.”, um and through reading different journals and you know going to a MESPA conference or um a some of our um magnet conferences and we would learn some.</p>
Interviewee B:	<p>..., we did a number of workshops. We went as a group. We took a team of teachers, We started with our 5th grade. They were sort of our pilot group.</p> <p>We didn't get a lot of ..., District IT leadership. That is what we are really struggling with.</p> <p>We didn't get a lot of support from the central office in terms of how to roll this out, so we just kind of made it up as we went along.</p>

	<p>But we did have a small group of teachers what just took it on and took off with it.</p> <p>I start with whoever is passionate about it, whoever really wants to take it to the next level. I let them do the hard work and then it spills over into the rest of the staff.</p>
Interviewee C:	<p>We tried to do some things district-wide. We did workshops and workshop days ... that kind of thing and then there was other you know articles that we found or attending some other informational sessions. Nothing as involved as you would have liked I guess.</p> <p>I definitely think I was a big supporter of it and pushing for it.</p> <p>A lot of it is kind of self-sustaining, people bring things that they find and share at staff meetings.</p>
Interviewee D:	<p>I had been an assistant principal, technically a TOSA ... for a school that had enacted a 1:1 initiative in District DD ..., and they worked ... with ... a huge tech group you ... They have a whole staff and people for things like this.</p> <p>I was very lucky that I had seen it done ... for these two elementary schools that I was supporting previously ... and ... got to see kind of all the mistakes they were making too, ... so that I could effectively say things like, “Well, then we’re going to need a parent agreement”.....</p> <p>...it was really just because I’ve seen ... what a team could do, and then I just knew that those were the things that we would need to figure out how to do.</p>
Interviewee E:	<p>So, the district professional development for the principals was absolutely intentional.</p> <p>The way it is being rolled out was probably one of the best initiatives that has probably ever been rolled out in a major district. I mean, it was prepping principals, introducing them to the tools, requiring them to download apps and not just be like a spectator in the training, but like you had to actually engage.</p> <p>Then in terms of the like implementation, they gave us the green light as administrators in creating that with our site leadership team, and then I actually created a technology integration team that consisted of our parents, staff and I didn’t have students per se, but we consulted with students a lot and had a Genius Squad to help us with rolling out for teachers...</p> <p>We turned over professional development once a month to showcase what they (teachers) were doing because they were so excited, and they wanted to share with their colleagues.</p>

The researcher conducted five telephone interviews with volunteer respondents to obtain additional information about their preparedness to provide training to newly hired teachers in regards to their 1:1 initiative. Numerous themes emerged related to principal preparedness to

provide training to newly hired teachers: communicating the expectation, use of mentors, collaborative teams, workshop week professional development, use of passionate teachers.

Table 19 includes comments from the five interviewees specific to their preparedness to provide training to newly hired teachers on the 1:1 technology initiative.

Table 19

Interviewee Comments Addressing Preparedness to Provide Training

Note: Interviewee responses to: “Can you tell me about your preparedness to provide training to your newly hired teachers in regards to the 1:1 technology initiative?”

Telephone Interview	Comments
Interviewee A:	<p>...I think mainly the process is that I will tell them these are the must know apps and technologies you will have to use.</p> <p>So, I don't even really have the experience using Seesaw, so then for new teachers that will be part of their mentor, um part of their relationship with their mentors.</p> <p>I don't know in our district orientation if they have provided training for that or not.</p> <p>I would expect teachers to show some professional initiative ... on their own to do it, ... to learn to take some time, going on line or whatever, ... and then and their mentor, and then my job is to just follow up and if they need any extra support, to provide it for them.</p>
Interviewee B:	<p>..... we have some PD at the beginning of the school year. We offer some. our tech department does do that. There are the devices, this is what you do, that type of thing.</p> <p>We've done a lot of TIES conferences. I am just constantly promoting using the technology.</p> <p>I kind of let them, they kind of push each other to it. Through learning teams and through ... their passion toward using tech in their curriculum.</p> <p>I can see where the teachers who aren't really getting on board. I have a couple, maybe, but they are starting to fall behind, and ..., I don't think it will be an issue because I think they will retire soon.</p>
Interviewee C:	<p>You know a lot if it you know honestly, we kind of lean on our mentorship program that we have. that is just a part of it and then as their grade, grade level team expectations.</p>

	<p>The funny thing is, our staff don't have devices they can all take with them yet. We are still transitioning from computers that they have all had. Well now we are down to maybe a handful that don't have a laptop they still have an old tower.</p> <p>I'm not going to claim to be an expert, but I can stumble my way through it so you can too, sort of thing.</p> <p>It wasn't me doing anything. It was the staff saying this is the way to go, kinda deal.</p>
Interviewee D:	<p>..., personally when I was in more of a teaching role I felt very prepared to tell teachers how to do that. At this point there are a lot of tools that the teachers use on a day to day basis that I don't use everyday and never did use.</p> <p>I do not feel prepared to be able to welcome in new staff, kind of onboard them.</p> <p>We do have a tech team. With 4 teachers I believe on the tech team this next year, 2 from elementary and 2 from the high school.</p>
Interviewee E:	<p>So our Office of Personalized Learning has summer sessions that are beginning, intermediate and advanced.</p> <p>I have a tutorial with the Apple classroom specialist, and ... one of my things that I am trying to model for staff is to showcase student voice and my key communication messages to staff around our continuous improvement plan.</p> <p>.... every week they are going to see me being a risk taker and trying out a different tool to showcase visual examples of our work and what we are doing in the building.</p> <p>I'm uploading and posting stuff every week on Twitter, but I'm not internally right doing that same thing with our staff and our parents outside of Twitter.</p>

Conclusion

Chapter 4 provided an introduction of the study, the study's five research questions, and survey and interview findings about the perceptions of Minnesota elementary principals regarding the implementation and leadership of 1:1 technology initiatives. Chapter 5 will detail conclusions, limitations, and recommendations for future research.

Chapter 5: Conclusions and Recommendations

Study Overview

The study examined the perceptions of a sampling of Minnesota elementary school principals on their experiences and preparedness to provide leadership and ongoing training for their school districts' 1:1 technology initiatives. The study instruments consisted of an online survey and five telephone interviews.

During an examination of the related literature, there appeared to be a lack of information from the principal's perspective regarding their involvement in planning and implementing a 1:1 technology initiative in their school district and, subsequently, their preparedness for providing training to their staff. The study intended to expand the body of knowledge to support school districts and principals in planning and implementing 1:1 technology initiatives.

The study examined the feedback of 115 Minnesota elementary school principals on their planning, implementation, and training experiences for leading 1:1 technology initiatives.

The following research questions guided the study:

1. How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school districts' 1:1 technology initiatives?
2. How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school districts' 1:1 technology initiatives?

3. How did a select sample of Minnesota elementary school principals rate the quality and value of the staff development provided by their school districts related to their 1:1 technology initiatives?
4. How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiatives in their school buildings?
5. How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on the school districts' 1:1 technology initiatives?

Research Findings: Question One

How did a select sample of Minnesota elementary school principals rate the extent of their involvement in planning and implementing their school district's 1:1 technology initiative?

From the study's online survey (Appendix B), the researcher obtained 115 responses of which 65 respondents or 56.5% stated their school/districts had implemented 1:1, 1:2 or BYOD (Bring Your Own Device) initiatives at the elementary school level.

- 64 principals responded to the survey questions corresponding to this research question.

According to Project Red, a key measure of effectiveness of a 1:1 initiative is the principal's involvement in planning, acquisition and implementation of the initiative. Marzano (2005) reported that an effective principal is held accountable for creating demand and developing buy-in while implementing and institutionalizing first or second order district change

initiatives. Research question one findings regarding involvement in 1:1 initiative planning were as follows:

- Fifty Minnesota elementary principal respondents or 78.1% with experience implementing 1:1 technology initiatives stated the extent of their involvement in planning the initiatives was “some” or “extensive”, while more than one in five respondents (14 or 21.9%) related their involvement in planning the initiatives was none or very little.
- When disaggregating data by years of experience, 16 or 69.6% of principals with 0-2 years of experience with a 1:1 initiative perceived their involvement at the level of “some” or “extensive”.
- Thirty-four or 82.9% of principals with more than two years’ of experience with their schools’ 1:1 initiatives perceived their involvement at the level of “some” or “extensive”.

Research question one findings regarding involvement in 1:1 initiative implementation were as follows:

- Sixty-four or 85.9% of Minnesota elementary school principal respondents stated the extent of their involvement in implementing 1:1 technology initiatives was “some” or “extensive”.
- When disaggregating data by years of experience with 1:1 initiatives 17 or 73.9% of principals with 0-2 years of experience perceived their involvement in implementation at the level of “some” or “extensive”.

- More than one elementary school principal in four respondents rated their involvement in implementing their school districts' 1:1 technology initiatives as none or very little, while 38 or 92.7% of principals with more than 2 years' of experience with a 1:1 initiative perceived their involvement at the level of "some" or "extensive".

These findings suggest that in Minnesota most school districts implementing 1:1 technology initiatives were involving principals at a relatively high level in both the planning and implementation phases of their technology initiatives. However, the findings also suggested that principals with more than 2 years' of experience with 1:1 initiatives perceived greater levels of involvement in both planning and implementing their initiatives than was the case of respondents with less than two years of experience with their districts' initiatives.

Research Findings: Question Two

How did a select sample of Minnesota elementary school principals rate the quality of their involvement in planning and implementing their school district's 1:1 technology initiative?

Shared planning of an innovation by members of the organization and the leader increases loyalty to the plan (Colandrea, 2012). Since research supports the principal's need to model and support staff for successful technology implementation (Anthony & Patavanich, 2014; Stuart et al., 2009), the quality of a principal's involvement in the planning and implementation of the initiative is significant.

Research question two findings regarding the quality of respondents' involvement in planning 1:1 initiatives were as follows:

- Fifteen Minnesota elementary principal respondents or 23.4%, nearly one in four respondents, stated the quality of their involvement in planning was “none” or “low” while 49 or 76.6% of respondents stated the quality of their involvement was “moderate” or “high”.
- When disaggregating data by years of experience with 1:1 technology initiatives, 15 or 65.2% of principals with 0-2 years of experience perceived a moderate or high quality of involvement in planning, while 34 or 82.9% of principals with more than 2 years’ of experience perceived a moderate or high quality of involvement planning in their districts’ initiatives.
- More than one in three or 34.8% of respondents with 0-2 years of experience with 1:1 initiatives perceived low or no quality to their involvement in planning their districts’ initiatives.

Research question two findings regarding the quality of respondents’ involvement in implementing 1:1 initiatives were as follows:

- Eleven Minnesota elementary school principal respondents or 17.2%, nearly one in five, stated the quality of their involvement in implementing their districts’ initiatives was none or low, while 53 or 82.8% of respondents rated the quality of their involvement in implementing their districts’ 1:1 initiatives as moderate or high.
- More than one in five, 5 of 23 respondents or 21.7% with 0-2 years of experience with 1:1 initiatives rated the quality of their involvement in implementing the initiatives as none or low.

- Six or 14.6% of respondents with more than 2 years' of experience with their districts' 1:1 initiatives rated the quality of their involvement in implementing their initiatives as none or low.

Research Findings: Question Three

How did a select sample of Minnesota elementary school principals rate the value of the staff development provided by their school districts related to the 1:1 technology initiative?

From the study's online survey (Appendix B) the researcher obtained 115 responses.

The research confirms a lack of technology training for principals is a major challenge for school leaders (Flanagan & Jacobsen, 2003; Schiller, 2003; Sincar, 2013; Thomas & Kzenek, 1991; Wang, 2010). Administrator technology training was identified by Thomas and Kzenek as a necessity for a technology innovation to succeed.

Research question three findings regarding the value of staff development provided by respondents' school districts related to 1:1 technology initiatives were as follows:

- Sixty-one or 100% of respondents stated their school districts' staff development on 1:1 technology initiatives had some value.
- More than one in four principals, 17 of 61 respondents, or 27.9% reported a high value to the district provided staff development on 1:1 technology initiatives.
- Ten responding principals or 16.4% rated their school districts' staff development training on 1:1 technology initiatives as low.
- When disaggregating by years of experience, 5 or 22.7% of respondent principals with 0-two years of experience with 1:1 technology initiatives rated their school districts' staff development on these initiatives as low.

- Of the responding principals with more than 2 years of experience with their school districts' technology initiatives, 5 or 12.8% rated their staff development on those 1:1 initiatives as low.

Research Findings: Question Four

How did a select sample of Minnesota elementary school principals rate their preparedness to provide leadership to their teaching staffs on their school districts' 1:1 technology initiative in their school buildings?

According to Fullan (2007, p. 156) change is the process of initiation, implementation and institutionalization, and the principal leads the change “on the ground”. Principals as technology leaders must demonstrate the skills to lead their schools and Kotter (2012) emphasized newly acquired mindsets must be continually nurtured to prevent a return to traditional practices. The International Society for Technology Education (ISTE) has developed clear standards for administrators which are frequently used as the benchmark for leadership indicators for instructional technology research (Metcalf, 2013; Richardson, Bathon, Flora, & Lewis, 2012; Richardson, Flora, & Bathon, 2013; Richardson & McLeod, 2011; Sincar, 2013; Unal et al., 2015).

Research question four findings regarding respondents' preparedness to provide leadership to their teaching staffs on 1:1 technology initiatives were as follows:

- Ten responding principals or 16.4% cited they had “very little” preparedness to provide staff leadership for their 1:1 technology initiatives, while 10 responding principals or 16.4% perceived they had “extensive” preparedness to provide staff leadership for their 1:1 technology initiatives.

- When disaggregating data by years of experience, 22.7% or more than one in five principals with 0-2 years of experience with 1:1 technology initiatives indicated very little preparedness to provide staff leadership for their 1:1 technology initiatives.
- Of principals with more than 2 years of experience with 1:1 initiatives, 5 or 12.8% rated their preparedness to provide staff leadership for 1:1 technology initiatives as “very little”.

Building-wide leadership of a 1:1 technology initiative requires principals to be skilled at providing individual attention to staff members, helping staff members consider old problems in new ways, including the ability to communicate high expectations and model the skills and behaviors expected from staff (Marzano et al., 2005). The findings indicate this is an area of need for Minnesota elementary principals leading 1:1 technology initiatives.

In addition, telephone interview responses from the five principals revealed a qualitative difference in the preparedness of those respondents to lead building wide technology initiatives. Two of the five principals interviewed received administrator specific training through their school districts. The remaining three interviewed principals primarily relied on attending a workshop or passionate teachers sharing their skills and tips at staff meetings. All five of the principals interviewed addressed modeling as an important feature of their building wide leadership, and one principal was committed to personally modeling the use of technology applications for the building staff. Four of the interviewed principals stated they are not personally modeling 1:1 technology strategies to their staffs, and one interviewed principal stated, “I tell them these are the must know apps”. Three of the interviewed principals relied on grade level teacher teams or building technology teams to model new technology or applications

for staff. Though ISTE has clearly defined standards and leadership behaviors necessary for successful technology implementation, interview responses indicate the ISTE standards and leadership behaviors are not fully implemented by Minnesota elementary school principals involved in 1:1 technology initiatives.

Research Findings: Question Five

How did a select sample of Minnesota elementary school principals rate their preparedness to provide training to newly hired teachers on the school districts' 1:1 technology initiative?

In *School Leadership that Works* (2005), Marzano et al. described a variety of school leadership styles and the 21 most impactful responsibilities of a school leader. A principal demonstrating leadership competency in “Intellectual Stimulation” during a 1:1 initiative would be responsible for the professional development of the staff. In 2002, Youngs and Kim determined a positive school climate was enabled when a principal provided the building technology professional development.

Research question five findings regarding respondents' preparedness to provide training to their newly hired teachers on 1:1 technology initiatives were as follows:

- Seventeen Minnesota elementary school principal respondents or 27.9%, greater than one in four principals indicated none or very little preparedness to provide 1:1 technology training to newly hired teachers while five of 61 respondents or 8.2% rated their preparedness to provide training to newly hired teachers as extensive.
- When disaggregating data by years of experience, five respondents or 22.7%, more than one in five principals with 0-two years of experience with 1:1 technology

initiatives indicated none or very little preparedness to provide training to newly hired teachers.

- Of principals with more than 2 years of experience with 1:1 technology initiatives, 30.8% rated their preparedness to provide training to newly hired teachers as none or very little.

The researcher noted that principals in buildings in which 1:1 initiatives had been implemented in the past 0-2 years indicated a higher level of confidence (as a percentage of principals) than principals in buildings in which the initiatives had been implemented more than two years'. In 2000, Ford noted that training, staff development and the ability to provide resources were the most important competencies of a technology leader.

From the interviews of the five principals, the researcher discovered that all five affirmed the lack of principal training and preparedness to train newly hired teachers. None of the five interviewees stated he/she was personally prepared to train newly hired teachers. One of the five interviewees was learning new applications to model with school staff members, and the four other principals reported it was the responsibility of the new teachers to take the initiative to train themselves or work with a mentor teacher to learn the expected skills and applications. Other thoughts shared by the interviewees with the researcher about strategies for providing new teacher training included the use of teacher learning teams, back to school workshop sessions, sharing "tips and tricks" at staff meetings and relying on a group of teachers who were the initial implementers to "push each other to it".

Discussion

In analyzing the survey responses, the researcher noted that in most cases, principals in schools with more than 2 years of experience implementing 1:1 technology initiatives tended to indicate higher levels of involvement in planning and implementing the 1:1 initiatives as well as higher levels of perceived quality to their involvement in planning for the initiatives. These findings could indicate that Minnesota school districts involved in the earliest adoptions of 1:1 technology initiatives tended to include more building principals in the planning stages of the technology initiative. Consequently, if building principals had higher levels of involvement in planning initiatives, it is logical that those principals would have higher levels of involvement in implementing the initiatives in their school buildings.

In addition, the responses of the more experienced principals, those with more than 2 years' of experience with 1:1 technology initiatives, also perceived higher values to the districts' provided staff development. It is probable building principals with higher levels of involvement in planning their districts' technology initiatives, may also have been more significantly involved in planning their districts' technology staff development, which could explain the perceived higher value of staff development reported by principals with more than 2 years' of experience than those principals with fewer years of experience with their school districts' initiatives. It is also possible that the value of district provided staff development regarding 1:1 technology initiatives declined as building principal involvement in planning for 1:1 technology initiatives declined. Since 1:1 technology initiatives are actually increasing across the State of Minnesota, study findings suggest current school district leadership in the State may benefit from greater involvement of their building principals during the planning stages of 1:1 technology initiatives.

The findings revealed a higher level of perceived quality of principal involvement in implementing the technology initiatives than planning those initiatives from all respondents, regardless of years of experience with technology initiatives. In addition, 60 or 93.8% of the Minnesota elementary principal respondents perceived some quality to their involvement in implementing technology initiatives. This finding was not surprising to the researcher since a building principal is responsible for implementing initiatives whether or not he or she is involved in planning the implementation of the initiative. It is the researchers' opinion, that, most people will provide positive ratings to initiatives for which they are responsible in implementing since performing that task is a reflection of their professional work.

According to the ISTE standards for administrators, principals as technology leaders are expected to promote and support excellence in professional practice through appropriate professional development and fostering professional learning. Research indicated a major challenge for school leaders is the lack of technology training for principals (Flanagan & Jacobsen, 2003; Schiller, 2003; Sincar, 2013; Thomas & Kzenek, 1991; Wang, 2010). In many cases, Scott McLeod noted, most of our school leaders have not received any technology training whatsoever. The researcher noted that responding principals in buildings with less than 2 years of 1:1 technology implementation were more confident in their preparedness to provide training for newly hired teachers than principals with more than two years' experience with 1:1 technology initiatives. The researcher noted that nearly one in three or 30.8% of principals with more than 2 years' experience with 1:1 initiatives reported none or very little preparedness to provide training to newly hired teachers, while 22.7% of principals with 0-2 years of experience with 1:1 technology initiatives reported the same. These findings indicate Minnesota elementary

principals require greater professional development on technology to support 1:1 technology initiatives in their school districts and provide training to their veteran and fledgling teachers.

Elementary principals are expected to provide building-wide leadership to all the initiatives in their buildings. The researcher found it compelling that, as 1:1 initiatives continue to expand in the State of Minnesota, more than one in five principals with 2 years or less experience with 1:1 technology initiatives reported very little or none in response to their preparedness to provide leadership for those initiatives. This is cause for caution and concern as school districts continue to implement 1:1 initiatives.

Based on information gathered during study interviews, the researcher noted there was not a common protocol for school districts implementing 1:1 technology initiatives. One principal responded that extensive training was provided to all district principals prior to the implementation of the 1:1 initiative in the school district. In that district principals were expected to create site technology leadership teams and, then, implement the 1:1 initiative in their schools according to the site technology teams. Four school districts did not provide building principals with professional development prior to implementation and delegated the implementation process to individual building principals. One interviewee reported, “We just kind of made it up as we went along.”

According to the review of literature, school districts are embracing 1:1 technology initiatives to raise student achievement and individualize instruction. Merely providing classrooms with new educational tools, a radio, television, overhead projector, smartboard or a 1:1 device, will not achieve the desired outcomes unless careful planning and implementation also occurs. Educators have the knowledge and resources to successfully implement innovations;

however, classroom innovations are often not implemented successfully. The cause may very well be that the innovation or initiative may have been provided to classroom teachers without careful planning, training, or an articulated plan for sustainable professional development. The study revealed in part, that a substantial number of respondents believed there were ill prepared to provide training of their school districts' 1:1 initiatives and, indeed, deserved further technology staff development.

Limitations

Limitations of the study include:

1. The number of survey participants was 115 of a possible 857 Minnesota elementary principals. Only 65 of the respondents worked in schools/districts with 1:1 technology initiatives. Survey participants could exit the survey at any time, hence responses to each question varied from 65 to 64 to 61. A larger response rate would have provided more confirming data regarding the implementation of 1:1 technology initiatives in Minnesota. The smaller number of respondents may have negatively impacted the answers provided about the number of years of 1:1 technology implementation. Consequently, the researcher was not able to make comparisons between different time bands.
2. The small sample size was a limiting factor. Increasing the sample size would provide a more comprehensive understanding of the research questions.
3. The survey instrument used to gather the quantitative data was brief. Survey items may have been confusing. It may have been helpful to provide a short advance mental organizer—prior to each set of questions—to furnish respondents with an

- opportunity for clarifying their thinking. For example: The next four questions will be inquiring about your involvement in PLANNING the school district's 1:1 technology initiative.
4. The survey distribution method was not ideal. It required more time than was anticipated. The survey was included in the weekly MESPA E-News sent to all MESPA members. The survey was embedded in the email and difficult to locate. The second week of distribution, the title of the weekly MESPA E-News referred to the 2018 national distinguished principal awardee, and to locate the survey a member needed to scroll quite a bit. A recommendation would be to ask MESPA officials to distribute the study survey in a separate email or for the researcher to contact division leaders individually for distribution.
 5. The timing of the survey posed a challenge. The survey was distributed in April during the State of Minnesota testing window. This was a stressful time for principals, teachers and students. Principals who serve as the school testing coordinators have additional demands on their time during the testing window.
 6. The number of 1:1 interviews conducted by the researcher was five. It is recommended that future researchers increase the number of 1:1 interviews and purposefully include respondents from both small, rural and large, urban school districts.

Recommendations for Further Research

The following are recommendations for further study:

1. It is recommended that future research include an increased sample size to gain a more comprehensive understanding of the research questions.
2. It is recommended that the survey instrument be modified for clarity.
3. It is recommended that the survey instrument be distributed to all MESPA members in a separate email by MESPA.
4. It is recommended that the study be replicated in secondary schools to ascertain the presence of 1:1 initiatives and what similarities or differences secondary leaders face.
5. It is recommended the study be replicated as a multi-state study so the findings are more comprehensive of a particular region or the entire United States.

Recommendations for Practice

The following recommendations are tendered for schools and school districts considering the implementation of 1:1 technology initiatives.

1. It is recommended school district leaders provide staff development on their 1:1 school districts' technology initiatives that is specifically focused on building principals prior to implementation.
2. It is recommended school district leaders consider providing ongoing staff development for newly hired teachers and administrators.
3. It is recommended school district leaders provide mobile devices to all staff members involved in their school districts' 1:1 technology initiatives.
4. It is recommended school district leaders develop sustainable replacement cycles related to the school technology devices provided by the school district.

5. It is recommended school district leaders significantly involve building principals in the planning and implementation of their school districts' 1:1 technology initiatives.
6. It is recommended school district leaders significantly involve building principals in the planning of their school districts' technology-related staff development.
7. It is recommended school district leaders monitor principal preparedness to lead and provide staff training on the school districts' 1:1 technology initiatives.

Summary

The study examined the perceptions of active Minnesota Elementary Principals Association members on the implementation of 1:1 technology initiatives in their schools and school districts. In addition, the study examined the perceptions of principals on their personal preparedness to provide leadership on their school districts' 1:1 technology initiatives to veteran and novice teachers.

The study's literature and research findings suggest principals who received intentional training in their personal use and classroom use of 1:1 technologies prior to (or concurrently with) implementation were more prepared to lead a school wide implementation. The task of training newly hired teachers is clearly a challenge, and in the opinion of the researcher must move beyond stating "expectations" to newly hired staff or relying on a "mentor teacher" relationship.

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Appendix A: IRB Approval



Institutional Review Board (IRB)

720 4th Avenue South AS 210, St. Cloud, MN 56301-4498

Name: Susan Powell
Email: posu1001@stcloudstate.edu

IRB PROTOCOL DETERMINATION: Expedited Review-1

Project Title: A Study of Minnesota Elementary Principals' Perceptions on 1:1 Technology Implementation

Advisor: Roger Worner

The Institutional Review Board has reviewed your protocol to conduct research involving human subjects. Your project has been: **APPROVED**

Please note the following important information concerning IRB projects:

- The principal investigator assumes the responsibilities for the protection of participants in this project. Any adverse events must be reported to the IRB as soon as possible (ex. research related injuries, harmful outcomes, significant withdrawal of subject population, etc.).

- For expedited or full board review, the principal investigator must submit a Continuing Review/Final Report form in advance of the expiration date indicated on this letter to report conclusion of the research or request an extension.

- Exempt review only requires the submission of a Continuing Review/Final Report form in advance of the expiration date indicated in this letter if an extension of time is needed.

- Approved consent forms display the official IRB stamp which documents approval and expiration dates. If a renewal is requested and approved, new consent forms will be officially stamped and reflect the new approval and expiration dates.

- The principal investigator must seek approval for any changes to the study (ex. research design, consent process, survey/interview instruments, funding source, etc.). The IRB reserves the right to review the research at any time.

If we can be of further assistance, feel free to contact the IRB at 320-308-4932 or email ResearchNow@stcloudstate.edu and please reference the SCSU IRB number when corresponding.

IRB Chair:

Dr. Benjamin Witts
 Associate Professor- Applied Behavior Analysis
 Department of Community Psychology, Counseling, and Family Therapy

IRB Institutional Official:

Dr. Latha Ramakrishnan
 Interim Associate Provost for Research
 Dean of Graduate Studies

OFFICE USE ONLY

SCSU IRB# 1810 - 2306	Type: Expedited Review-1	Today's Date: 4/20/2018
1st Year Approval Date: 4/19/2018	2nd Year Approval Date:	3rd Year Approval Date:
1st Year Expiration Date: 4/18/2019	2nd Year Expiration Date:	3rd Year Expiration Date:



Institutional Review Board (IRB)

720 4th Avenue South MC 204K, St. Cloud, MN 56301-4498

Continuing Review / Final Report

Principal Investigator: **Susan Powell**

Co-Investigator:

Project Title: **A Study of Minnesota Elementary Principals' Perceptions on 1:1 Technology Implementation**

If the project has been completed (no longer collecting data on human subjects) please indicate your projects status under Final Report and complete questions 1 through 5. If you have completed collecting data on human subjects but continue to analyze the data, as long as no new data is being obtained, your project would be considered completed.

If the project has not been completed (you are collecting data on human subjects) please indicate the status of your project under Continuing Review/Project Continuation and answer questions 1 through 5.

Final Report

- The Project has been completed.
 Project has not and will not be conducted. Explain:

Continuing Review/Project Continuation

- Data collection continues with enrolled participants.
 Participant recruitment continues following approved IRB protocol.

Have any changes been made to your research project (changes in subject recruitment, informed consent documents, design, methodology, procedures, etc.) since it was approved by the IRB?

- No
 Yes, explain:

Final Report and Continuing Review/Project Continuation, please answer the following:

1. How many participants have participated in your study _____
2. Have any adverse events (complaints, unexpected reactions, discomfort, or problems) occurred during this research project
 No
 Yes, explain:
3. Have any participants withdrawn from the research, either voluntarily or at the researcher's request?
 No
 Yes, explain:
4. Has any new information been identified that may affect the willingness of subjects to participate in this research project?
 No
 Yes, explain:
5. Have any changes been made to your research project (changes in subject recruitment, informed consent documents, design, methodology, and procedures, etc.) since it was approved by the IRB?
 No
 Yes, explain:

Principal Investigator's Signature

Date

SCSU IRB#: 1810 - 2306

Appendix B: Online Survey

Minnesota Elementary Principal Perception Survey

Sue Powell

Disqualification Question:

1) Does your school/district have a 1:1, 1:2 or BYOD initiative at the elementary level? (yes/no)
If yes...go on If no...thank you for taking the time to complete this survey

Demographics:

1) How many years has your school/district had a 1:1,1:2 or BYOD initiative?
(0-2) (3-5) (6-8) (9 - 11) 12+

Investigative Questions:

- 2) To what extent would you rate your **involvement in planning** for your district/school's 1:1 technology initiative? (extensive, some, very little, none)
- 3) To what extent would you rate your **involvement in implementing** your district/school's 1:1 technology initiative? (extensive, some, very little, none)
- 4) To what degree would you rate the **quality of your involvement** in the **planning** for your district/school's 1:1 technology initiative? (extensive, some, very little, none)
- 5) To what degree would you rate the **quality of your involvement** in the **implementation** of your district/school's 1:1 technology initiative? (extensive, some, very little, none)
- 6) To what degree would you rate the **value of the staff development** provided by your district/school in regards to the 1:1 technology initiative? (extensive, some, very little, none)
- 7) To what degree would you **rate your preparedness to provide building-wide leadership** in regards to the 1:1 technology initiative? (extensive, some, very little, none)
- 8) To what degree would you **rate your preparedness to provide training to newly hired teachers** in regards to the 1:1 technology initiative? (extensive, some, very little, none)
- 9) If you would be willing to answer a follow up question by telephone please enter your name and phone number.

Appendix C: Informed Consent Form

A Study of Minnesota Elementary Principals' Perceptions on 1:1 Technology Implementation

Consent to Participate

You are invited to participate in a research study about the perceptions of Minnesota Elementary Principals on 1:1 technology initiatives.

If you agree to be part of the research study, you will be asked to complete a short survey consisting of the possibility of one to ten questions. The survey will take less than 5 minutes to complete.

Benefits of the research: The purpose of the research is to determine the extent and value of an elementary principal's involvement in the planning and implementation of a school district and/or elementary school's 1:1 technology initiative. The research will also determine the elementary principal's preparedness to provide ongoing technology leadership and training to current and newly hired staff. The potential positive impacts of the study would involve informing building and district leadership on the value of elementary principal involvement in planning and implementing a 1:1 initiative as well as the preparedness of principals to sustain the initiative.

Risks and discomforts: The risks and discomforts associated with this research have been lessened with the use of an anonymous survey that will not gather any identifying information. If a respondent agrees to a follow up phone interview, no identifying information will be included in the research. All names of individuals, schools and districts will be confidential and stored at St. Cloud State University according to the St. Cloud State University statistical center's protocol.

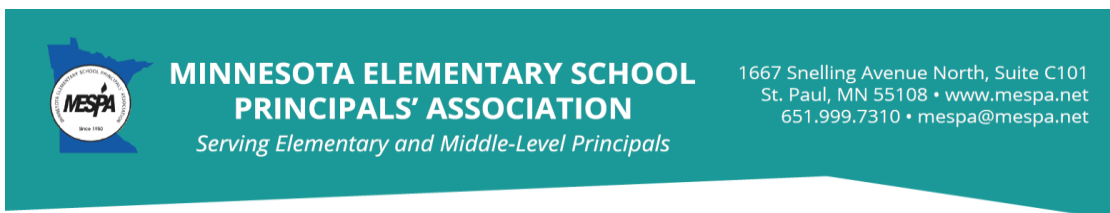
Data collected will remain confidential. Data will be reported and presented in aggregate (group) form or with no more than two descriptors presented together. All responses will be kept strictly confidential. If you agree to participate in a follow-up phone interview consisting of two questions, your name will not be disclosed. Quotes might be used, but they will be de-identified. During the interview you may refuse to answer any questions.

Participating in this study is completely voluntary. Your decision whether or not to participate will not affect your current or future relations with St. Cloud State University, or the researcher. If you decide to participate, you are free to withdraw at any time without penalty.

If you have questions about this research study, you may contact Sue Powell at suejpowell@gmail.com or 612-801-9976 or student advisor, Dr. Roger Worner at rbworner@stcloudstate.edu. Results of the study can be requested from the researcher or obtained from the St. Cloud State University Repository following publication.

Your completion of the survey indicates that you are at least 18 years of age and your consent to participation in the study.

Thank you for considering participating in my study, Sue Powell

Appendix D: Letter from MESPA

To Whom It May Concern,

The Minnesota Elementary School Principals' Association (MESPA) has agreed to sponsor the research being conducted by Susan Powell as part of the requirements for her Doctorate in Education Leadership. Principal Powell will be conducting a survey of elementary principals who are members of MESPA. MESPA will be sending out the survey to MESPA members via email on behalf of Principal Powell. MESPA will also be providing an introductory letter when we send out the survey so that our members know that MESPA is in support of this research/survey.

If you have any questions please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Jon Millerhagen'.

Jon Millerhagen
Executive Director
Minnesota Elementary School Principals' Association

